

DEPARTMENT OF COMMUNITY HEALTH  
ADDIS ABABA UNIVERSITY

**"SEXUALLY TRANSMITTED DISEASES  
WITH EMPHASIS ON SYPHILIS  
AMONG PREGNANT WOMEN  
IN KETCHENE AWRAJA,  
ADDIS ABABA."**

BY

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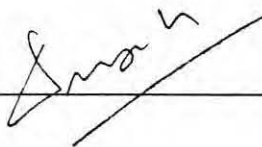
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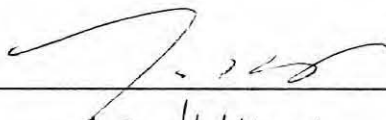
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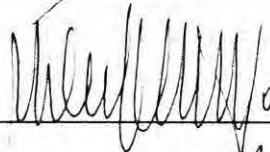
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## LIST OF ABBREVIATIONS

- FTA-ABS - Fluorescent Treponema - Antibody Absorption
- HIV/AIDS - Human Immunodeficiency Virus/  
Acquired Immunodeficiency Syndrome
- IDRC - International Development and Research Centre
- LGV - Lymphogranuloma Venereum
- MCH/FP - Maternal and Child Health/ Family Planning
- MED. LAB. TEH - Medical Laboratory Technician
- MOH - Ministry of Health
- NRIH - National Research Institute for Health
- PHC - Primary Health Care
- RPR - Rapid Plasma Reagin Test
- STDs - Sexually Transmitted Diseases
- TPHA - Treponema Palladium Haemagglutination Assay
- VD - Venereal Diseases
- VDRL-Test - Venereal Diseases Research Laboratory Test

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## ABSTRACT

The research design was a community based cross-sectional study; it was conducted among second and third trimester pregnant women by random sampling in Ketchene area (previously called Ketchene Awraja) which is part of Addis Ababa city. The objective was to determine the prevalence rate of syphilis and to assess knowledge of pregnant women regarding sexually transmitted diseases with emphasis on syphilis.

A total of 410 pregnant women in the second and third trimester from 16 kebeles of the district were included in the study. They underwent a physical examination, laboratory examinations were done and pretested questionnaires were administered in the order mentioned.

The study showed that 11% of second and third trimester women were positive by RPR - blood examination test for *treponema palladium* syphilis and 7.1% were positive by TPHA confirmatory-test for *treponema palladium* syphilis.

Knowledge regarding the existence of STDs was generally high: the percentages who mentioned various STDs when asked to list those they knew were HIV/AIDS (90.2%), syphilis (89.3%), Gonorrhoea (86.8%), chancroid (40%) and LGV (20%) respectively. Knowledge regarding the

causes of STDs is inadequate, particularly with regard to causes of gonorrhoea, but knowledge regarding treatment and prevention is fair.

The frequency of asymptomatic syphilis was high; more than half of the 29 TPHA confirmed syphilis cases had no symptoms; likewise, the signs/symptoms had a low positive predictive value, that is very few of those with positive signs/symptoms of syphilis were actually positive by the TPHA-test. This may be because they had other STDs (LGV, Chancroid, Herpes genitalis) which have also similar clinical manifestations.

In this study there was no association between women's knowledge regarding STDs and their syphilis status as measured by the TPHA test.

It is recommended to do vaginal examination and swabs for gram stain and wet-mount routinely during antenatal and family planning sessions. Screening for syphilis using at least RPR test should be a routine procedure in pregnant women.

## INTRODUCTION

One of the most disappointing aspects of community medicine during the past three decades has been the great increase in the incidence of sexually transmitted diseases. The sexually transmitted diseases are a group of communicable diseases that are transferred predominantly by sexual contact; they are now the commonest group of notifiable infectious diseases in most countries (1).

Changes in sexual behaviour and contraceptive practices, the rapid increase in the number of young adults, specially in developing countries, increasing urbanization and increasing promiscuity, rapid socio cultural changes and political upheavals, indiscriminate use of antibiotics by the population, increasing drug resistance in the causative organisms, and a conservative legislature have led to a tremendous increase in the number of new cases of sexually transmitted diseases diagnosed through out the world. The overall effect of these changes is to challenge and destabilise traditional values and customs especially with regard to sexual behaviour (2,6).

The infective agents include viruses, spirochaetes, bacteria and protozoa, but most of them share the characteristic of being delicate, being easily killed by

drying or cooling below body temperature, with the reservoir exclusively in man. Hence, transmission is mainly through direct close contact and rarely indirectly through fomites (3).

For most sexually transmitted diseases the route of transmission is mainly through genital contact, although extra genital sexual contact such as kissing, and through non-sexual contact, eg. congenital syphilis, gonococcal ophthalmia neonatorum through fomites, e.g. soiled moist clothing such as wet towels, may transmit vulvovaginitis to pre-pubescent girls (3).

The individual's knowledge alone about most STDs is not sufficient to bring about behavioral change related to its transmission or prevention, and perception of self-risk (4). Sexually transmitted diseases may have a significant impact on the pregnant woman and her fetus and neonate. The clinician caring for pregnant women must be aware of the multitude of STDs and their potential risks during pregnancy (3).

From a review of published reports, the prevalence of syphilis sere-reactivity in pregnant women in many parts of Africa is at least 10%; the prevalence of gonorrhoea in pregnant women in many parts of Africa is also at least 10% and it approaches 20% in some areas (5). Sexually transmitted infection may result in serious damage to the reproductive tract of the mother, damage to

the fetus, wastage of pregnancy or illness or death of the infant (7).

As stated above sexually transmitted diseases constitute a major health problem and particularly syphilis is a great problem in affecting neonates of infected mothers.

Thus, to determine the prevalence of syphilis in relation to age, marital status, education, income and occupation in pregnant women and to assess the knowledge of pregnant women regarding STDs with emphasis on syphilis and to measure the magnitude of asymptomatic syphilis in pregnant women this study was conducted in Ketchene awraja, Addis, Ababa.

According to Ketchene Awraja Health profile, STDs are ranked among the ten top leading diseases in the awraja, in 1992 (8).

From all STDs syphilis was selected because, even though gonorrhoea is more prevalent according to the report of the awraja, syphilis is more likely to be asymptomatic and have more serious consequences for the pregnant women as well as for the newborn.

Furthermore the relevance of this study lies in its envisaged ability to provide base-line data against which to monitor changes resulting from any proposed preventive intervention against the transmission of STD's with particular emphasis on syphilis.

New, more effective means of prevention, diagnosis and treatment are being sought using research techniques in microbiology, immunology and behavioral science. In the meantime, medical screening, treatment and contact tracing should be carried out for patients and their sexual partners. Sexually active individuals must be empowered with knowledge and emboldened to protect themselves and their established or potential families from these common infections. Existing means of screening and treating must be utilized fully.

Ketchene awraja was selected for the study because it was the area of assignment for the principal investigator during the periods of his community residency programs.

## LITERATURE REVIEW

### History of STDs with particular emphasis on syphilis.

Sexually transmitted disease were an age-old human scourge that plagued millions for many centuries. This group of diseases has been known to different nations and peoples of the world and to others whose old medical literature makes reference to these diseases.

Even though there is a controversy of the origin of syphilis, from the ancient STDs, syphilis is the one which is recorded at the end of the fifteenth century in the Italian peninsula (9).

Nicco Leonicensi of Vicenza (1428 - 1524), professor of medicine at Ferrara, wrote a pamphlet in conjunction with the humanist, Aldus Manutius, of Venice in 1497 in which he has described the disease and included its differential diagnosis. Leonicensi stated that there had been accounts of similar disease as early as Hippocrates, in whose aphorisms (book 3, chapter XX) it is mentioned, that in the summer ulceration of the mouth, skin eruptions, and mortification of the privy parts occur (10).

As far as back biblical times venereology has always had its international aspects extending back through the time when each country in Europe blamed another for the introduction of syphilis at the end of the fifteenth

century. Notable early legislation with international relevance affecting the venereal diseases was the Copenhagen regulations of 1802, which provided for the free treatment of foreign seamen (11).

The term venereal disease has been replaced by the term sexually transmitted diseases (STDs) to denote all infectious diseases whose main mode of transmission is by sexual contact. This was done on the recommendation of a WHO expert committee on venereal disease and treponematoses which met in Geneva (1983). STDs encompass not only the five VD diseases (syphilis, gonorrhoea, chancroid, lymphogranuloma venereum and granuloma inguinale), but also a growing number of other diseases which might be considered the "new generation of sexually transmitted diseases (1,13).

Prevalence of STDs globally and particularly  
in developing countries.

STDs in general:- The sexually transmitted diseases are a group of communicable diseases that are transferred predominantly by sexual contact; they are now the commonest group of notifiable infectious diseases in most countries (14).

Despite some fluctuation in their incidence they continue to occur at unacceptably high levels. With improved methods for diagnosis has come awareness of the

growing consequences of the increase of STDs on health and society which extend beyond the traditional sphere of venereology. In particular, a major impact of the newer STDs has been noted on maternal and infant morbidity and on human reproduction and infertility(4).

The number of agents known to be sexually transmitted has increased and more than 20 sexually transmitted infectious diseases have been recognized. One sexually transmitted disease that has recently emerged is the acquired immunodeficiency syndrome (AIDS), which is caused by a retrovirus; it is highly fatal disease and is spreading rapidly throughout the world (4).

Accurate information and data on the incidence and reasons for the wide dissemination of those infections are available mostly from developed countries where some of these diseases are notifiable. In developing countries where diagnosis is based on clinical impressions of history alone, where diagnostic facilities are lacking or non-existent, and where self-treatment is common, the figures reported by official sources are usually not accurate (1,13.).

One of the major reasons for the current STD epidemic has been the failure of clinicians to ensure that the sexual partners of patients with STDs are examined and treated. Most persons with genital discharges, lesions, or pain cease sexual activity and

seek medical care. Accordingly, those who transmit infections usually are among the minority and are asymptotically infected or have mild symptoms.

Therefore, they often will not spontaneously seek medical attention and physicians must see that they are examined and treated (17).

STDs are hyper-endemic today in many areas of the developing world, including rural areas. They account for 2.5 to 15 percent of all adult outpatient diagnoses in Africa (14).

STDs in the tropics are also characterized by a higher incidence of complications, which include urethral strictures, congenital syphilis, pelvic inflammatory disease (PID), ectopic pregnancy, infertility, pregnancy wastage, perinatal morbidity, and certain cancers (e.g. cervical cancer) which are unusually common (in the tropics) (18).

Official incidence rates in Latin American countries vary between 100 and 300 cases per 100,000 population per year for gonorrhoea, and between 10 and 300 cases per 100,000 population for syphilis. The annual incidence of gonorrhoea in Africa is estimated at 3000 to 10,000 per 100,000 general population. Reliable incidence figures do not exist for most STDs for most countries in the world. There is generally a rising trend of STDs in all countries of the world, rich and poor (19).

The same rising trend is seen in Ethiopia too as observed by the increase registered cases in the comprehensive health service directory of the Ministry of Health. In 1983/84 G.C. there were 107,989 reported cases of STDs. They were 3.4% of all diagnoses in the top 15 leading causes of outpatient morbidity and occupied ninth place. In 1986/87 G.C. there were 138054 cases of STDs. They constituted 4.7% of all diagnosis among the 15 leading causes of outpatient morbidity and had jumped to sixth place, a 1.3% increase over the previous years (16). The prevalence of STDs in Ethiopia is not known, owing to lack of laboratory facilities, under-reporting, and self treatment, use of traditional healths, or nonuse of any healers resources for this stigmatized health problem (2).

Syphilis in particular:- From all sexually transmitted diseases syphilis is thought to be one of the most widespread diseases in the tropics, particularly in large towns. However, accurate figures are rarely available, and interpretation of serological tests is often difficult in areas where other treponematoses have been endemic or are still occurring. Annual incidence rates of syphilis as high as 1400 per 100,000 populations have been reported in Africa. Even after the discovery of *treponema palladium* in syphilitic material of serum by Schaudinn and Hoffman in 1905, syphilis still is one of the major cause of public health problem among all STDs (16).

Syphilis in pregnancy was responsible for 3 to 5 percent of perinatal deaths in African Cities, and congenital syphilis is still a problem in many parts of the world (14).

Assuming the reporting errors in each country to be consistent, reports of positive serological tests among antenatal clinic attendants range between 0.03% in developed countries and 22% in developing countries. Thus the developing countries, in many cases, show very high prevalence rates of syphilis. Control programmes are poor or non-existent, health education is impeded by illiteracy and inappropriate messages, and there are many competing priorities for the very limited human and

economic resources available (17).

According to the study of genital infections in prenatal and family planning attendants in Swaziland in 1980 G.C, the percentage of positive serological tests for syphilis among pregnant women was 10% for VDRL or RPR and 33.3% for TPHA or FTA-ABS test (20).

A 1984 study of sexually transmitted diseases was carried out among randomly selected attenders at an antenatal clinic in the Gambia; serological test positivity for syphilis was 17.5% by VDRL or RPR and 7.2% for TPHA or FTA-ABS test (21).

A 1980 study was carried out in Zambia in sexually transmitted diseases in pregnant women; the results showed the serological test for syphilis was positive in 14.3% by VDRL or RPR and 12.5% by TPHA or FTA-ABS test (22).

In Kenya in 1986 a study was carried out in pregnant women; serological test for syphilis was positive in 4% by VDRL or RPR and 11% by TPHA or FTA-ABS test (23).

In a study performed in South Africa to evaluate the role of detecting asymptomatic bacteriuria and endocervical infections in the black prenatal patients attending King Edward Hospital (KEH), Durban, with the view to justifying a screening programme, a serological test for sexually transmitted diseases showed the presence of syphilis to be 7.6% (6).

Congenital syphilis was the fifth and fourth leading cause of perinatal mortality in series from Addis Ababa and Durban respectively (24).

In 1970 Larson (9) reported that of all pregnant women and their babies admitted to MCH centre in Addis Ababa, slightly more than 15% had positive serological test results for syphilis; 21% of their live born children from mothers who were positive had clinical signs of congenital syphilis. Still births and abortion among the sere-positive women were two times higher than in the general population of pregnant women who attended the centre. The same author has also estimated the incidence of congenital syphilis to be 3.2% for Addis Ababa.

In Ethiopia in 1977 prevalence of a positive serological test for syphilis in pregnant women was estimated to be 12.7% by VDRL or RPR and 10.9% for TPHA of FTA-ABS test (10). Even though sex workers are not representative of the community, a 1990 sere-survey for HIV infection conducted on sex workers in Addis Ababa, Ethiopia indicated that the presence of syphilis was 37.3% which is a potential hazard for the country (26).

Special sere-surveys for syphilis in different parts of the country (Ethiopia) showed prevalence rates ranging from 10.9% to 50.5% (16).

### Clinical Manifestation of Syphilis

Syphilis is a chronic systemic infection caused by *Treponema palladium*, and is usually sexually transmitted. It is characterized by an incubation period averaging 3 weeks followed by a primary lesion associated with regional lymphadenopathy. There is a secondary bacteraemia stage associated with generalized mucocutaneous lesions and generalized lymphadenopathy, a latent period of sub-clinical infection lasting many years, and in about one-third of untreated cases, a tertiary stage characterized by progressive destructive mucocutaneous musculoskeletal or parenchyma lesions, aortitis, or central nervous system disease (12,16,19).

Nearly all cases of syphilis are now acquired by sexual contact with infectious lesions (i.e the chancre, mucous patch, or condyloma latum); uncommon modes of transmission include non sexual personal contact, contact with contaminated fomites, or infection in utero or following blood transfusions (3)

Of course, there has been much speculation about the origin and differentiation of: (A) venereal syphilis (*Treponema palladium*, (B) yaws (*T. Pertenuae*) (C) pinta (*T. Carateum*) and (D) non-venereal syphilis (*T. Palladium*) organisms. One view regards the organisms as being virtually identical but apparent differences in

clinical manifestations result from epidemiological factors; the other view regards the organisms as separate but related entities (3).

#### Prevention of STDs.

Prevention activity for STDs is any activity which minimizes the adverse health effects of those group of diseases (28).

Many developed countries have succeeded in minimizing STDs, but in many developing countries 10% or more of their daily workload may be related to STD and their complications. However diagnostic facilities at the PHC level are often either limited (microscopes only) or non existent. Furthermore, even in centres with access to better laboratory facilities, the delays in the reporting of these results and the limitations of the techniques used for STD detection may hinder timely treatment of infectious cases. Long waiting times for consultations, scarcity of drugs, and poor service are often encountered (29). Because of the above mentioned obstacles, a large proportion of STD patients resorts to self-styled practitioners outside the officially supported STD programs and public health services. Patients who can afford the expense seek private physicians, who seldom provide partner management and rarely report STD cases (30,31).

A further difficulty is that antimicrobial resistance of STD organisms has become a major problem in most developing countries and has rendered some of the low cost drug regimens ineffective.

Thus, prevention measures reduce:

- a) The incidence of disease;
- b) The duration of the disease;
- c) The effects of each case, including both the physical complications and physiological consequences; or
- d) The cost of achieving certain outcomes; i.e. increase the efficiency of services.

Therefore, by the use of four principal intervention strategies, STDs might be controlled the following ways

1. Health promotion
2. Disease detection
3. National treatment programmes, and
4. Contact tracing and patient counselling, clinical services will be the vehicle for some part of each of these strategies.

Even though; improving prevention mechanism for STDs is not an easy matter in this country, searching all means of new strategies together with situational analysis is very important for improvement.

The social consequences, economic cost, impact on

maternal and child health, and difficulty of diagnosing and treating many STDs is well recognized by the Ethiopian government, which has carried out research and clinical trials since the 1940s (2) and developed the department of STDs and the AIDS control programme in the mid 1980s ( 2 ).

Nevertheless, barriers to effective control of STDs are the casual attitude of many Ethiopians toward sexual relations with prostitutes and towards the seriousness of his or her STD (2,31).

To change the attitude of the community, baseline data should be at hand to generate new ideas and to strengthen the existing ones.

Therefore, the purpose of this literature review was to better understand different methods of study, their advantages and disadvantages, and to determine which ones can be implemented locally. There are economical barriers in a poor country like Ethiopia, and so we should accept other countries' research methods and results; nevertheless one has to spend some money on research to get baseline data locally to identify the existence of problems and to form appropriate plans. In particular, prevalence and knowledge data at the community level are essential to planning. Without such data, it is difficult to plan realistically: for example, before Larson's 1970 study, health professionals

believed congenital syphilis to be rare in Ethiopia. His study showed that the situation was otherwise. This was because of the difficulty of diagnosing a disease with symptoms similar to other highly prevalent diseases, busy schedules, and lack of funds for serological testing.

Before the study reported on in this thesis was planned, the community prevalence of syphilis was not known for the Ketchene Awraja, or for other similar Awrajas. Also, there were no data on whether pregnant women are aware of the serious consequences of syphilis, or indeed of what their general knowledge is concerning the causes, prevention and curability of the various STD's.

Also, from a management point of view, there is a serious problem of lack of tests for diagnosing syphilis; as a consequence, it is tempting to prescribe antibiotics in the absence of test results, leading to inefficient use of antibiotics and to drug resistance. Therefore, it is important to understand how often syphilis can be asymptomatic and how often symptoms/signs do not automatically imply syphilis.

The study was conducted in Ketchene Awraja among second and third trimester pregnant women, because it was the place assigned for the principal investigator for the community health residency programme under Addis Ababa University.

Pregnant women were selected, because they are a high risk group and syphilis is more likely to be asymptomatic and have more serious consequences for the pregnant women as well as for the newborn.

## OBJECTIVES

### General Objectives

To determine the prevalence rate, distribution and knowledge of syphilis in pregnant women in order to recommend effective intervention methods.

### Specific Objectives

#### I. Primary Objectives

1. To determine the prevalence of syphilis among pregnant women.
2. To determine the distribution of syphilis by age, marital status, education, income and occupation in pregnant women.

#### II. Secondary Objectives

1. To assess the knowledge of pregnant women regarding STDs with emphasis on syphilis.
2. To measure the magnitude of asymptomatic syphilis in pregnant women.

Note:- The principal investigator wanted to include serum testing for HIV infection as part of the study but was unable to do so for technical reasons.

## METHODS

### Study design.

The research design was a community-based cross-sectional study which was conducted among second and third trimester pregnant women randomly by house-to-house visit in Ketchene area, previously called Ketchene Awraja, which is part of Addis Ababa city. The study was carried out from December 2, 1992 to January 30, 1993.

### Population

The study area is located in the northern part of Addis Ababa city in the Ketchene area in two weredas, woreda one and nine. The area of woredas is about 4.1 square kilometres and the population is estimated to be 124,963. The overall population density was 31,240 per square kilometre. There is one hospital, one MCH/FP clinic, one non-governmental clinic and other first aid clinics in the district.

The source population of the study were all pregnant women in the two weredas from sixteen kebeles (social administrative units).

### Sampling procedure

According to the population projection from the 1984 census the total population in the area is about 124,963. Assuming that pregnant women in the area constitute 2.5% of the population, an estimated 3124

pregnant women were expected.

Sample size calculations were made based on the following assumptions. In Ethiopia pregnant women comprise about 5% of the total population and for Addis Ababa this estimate is lower, about 2-3% (40).

#### Exclusion criteria

To be on the safe side and to minimize selection bias, first trimester pregnant women were excluded from the study as first trimester pregnancies are sometimes difficult to detect. Pregnant women who delivered during the study were also excluded.

#### Inclusion criteria

All second and third trimester pregnant women were included in the study, because detection of pregnancy at this time is less difficult.

A total of 496 pregnant women who satisfied the criteria were identified during the study period.

The expected prevalence of syphilis in pregnant women is estimated to 50% and the desired confidence limit and margin of error were set at 95% (1-alpha) and .05 respectively.

By substituting the figures for the appropriate symbols in the formula below, the number of pregnant women required was calculated to be 384 (41).

$$n = \frac{Z^2 (p) (1-p)}{L^2} = \frac{1.96^2 (0.5) (1-0.5)}{0.05^2}$$

$$n = \underline{384.}$$

Where n = The required size of the sample

p = The estimated prevalence rate of syphilis,  
here 0.5,

z = the value of the standard normal distribution  
corresponding to a confidence level of 95%

L= The margin of error, here 5% (0.05)

In order to compensate for pregnant women that would become non respondents, a safety margin of 30% was thought to be adequate and was added to the figure obtained by the above mentioned formula.

Even though a safety margin of 30% non responses were allowed for, only 86 (17.3%) of second and third trimester pregnant women were missed. The reasons were: 36 (8.8%) were delivered, 8 (2%) changed residence and others 42 (8.5%) were agreeable to come to the clinic, but were not located after four subsequent home visits , leaving 410 (82.7%) of second and third trimester pregnant women who were included; this is above the required sample of 384.

## DATA COLLECTION

All data for 410 pregnant women were collected from December 2, 1992 to January 30, 1993 from those 496 identified pregnant women.

Data was collected by sixteen data collectors (14 females and two males) who had completed at least grade 12 and were aged between 25 to 40 years and knew the area well.

Working hours were 8 am to 4 pm with rest for lunch between 12am-1pm. Working days were Monday to Friday.

For the sixteen data collectors, laboratory technicians and interviewers, orientation and training was given for 4 days before the main study was started. Training was through lectures, discussions, demonstrations and role-playing, in which each trainee was given the chance to play the roles of both an interviewers and respondent. For training of interviewers three MCH nurse were selected. Orientation and training was conducted by the principal investigator. Difficulties that may arise during the process of the interview were explained. Going through the questionnaire via the correct sequence of questions was explained to interviewers. Special emphasis was given on how to state questions politely, clearly and without giving leading opinion to the respondents. The designed questionnaires were pre-tested with 48 pregnant women in another area, which is far away (12

kilometres) from Ketchene. After the pre-test, the format of the questionnaires was modified accordingly. Questionnaires were prepared to determine the socio-demographic characteristics like address, age, educational status, marital status, occupation, income, ethnicity, religion and reproductive history of pregnant women; on the other side the questionnaire was developed to assess the women's knowledge regarding STDs. The questionnaires were prepared in English and then translated to the Amharic language and then back-translated to English by two people who have good knowledge of English and Amharic to ensure reliability.

A total of 36 questions were included in the questionnaire in addition to the demographic items. In order to encourage respondents to give complete and honest answers, questions were posed in such a way that they did not directly deal with their own sexual experiences.

Supporting letters for collaborations were written by the head of Ketchene Awraja health Department to all Kebele Administrations and to the Awraja (district) Administration office before the main study was started.

Then, after explaining the objectives of the study to the identified pregnant women, the data collectors gave an appointment to the second and third trimester pregnant women to come to the Gulele MCH/FP clinic for

physical examination, laboratory examination and an interview. At the clinic physical examinations, laboratory examinations and interviews were made by the MD, medical laboratory technologists, and nurses respectively.

At the Gulele MCH/FP clinic, to detect the presence of treponema palladium, ten millilitres of blood was drawn with vacu-tainer tubes (Beckto, Dickinson and Co) from each women by a senior lab-technician (21). The blood was centrifuged within six hours and thereafter, the blood was transported to the National Research Institute for Health (NRIH) for investigation of treponema palladium by Rapid Plasma Reagin card test (RPR) and Treponema Palladium Haemagglutination Assay (TPHA) test and to store the sera at -20c. The sensitive rapid plasma reagin test is the most widely used reagin antibody, which can be automated and is used to examine large numbers of sera (12).

The automated haemagglutination assay (TPHA) is at present the most specific method and confirmatory test for the detection of antibodies against treponema palladium (12).

All the 410 samples were examined by the RPR test and those who were positive for RPR test were retested (re screened) by TPHA confirmatory test. Another 50 sera negative for RPR test were also retested (re screened) by

TPHA confirmatory test. None of the these 50 samples, negative for RPR, were found positive for TPHA test. Only 50 negative sera for RPR test were retested (re screened) by TPHA, because there was not enough TPHA reagent left to test all of the sera that were negative by RPR.

All the tests were done according to the direction of the manufacturing company.

Alcohol swabs for cleaning the skin and sterile needles and syringes were used for each woman. Gloves were also provided to the laboratory technicians who drew and handled the blood. Results were collected by the principal investigator.

All women who had positive diagnoses of syphilis by TPHA test were given standard treatment with benzathine benzyl penicillin.

#### Ethical considerations

The objectives of the study were explained by the data collectors to the identified pregnant women. They were assured that any information concerning them would never be passed to any individual or institution without their consent. The study number (code numbers) and address were recorded, but their names were not recorded.

Expenses for all costs were paid for all pregnant women for those who participated in the study (fees for

registration, physical examinations, laboratory examinations, drugs and even for delivery services). Treatment was given according to the recommendations of WHO for pregnant women for those who were positive in TPHA-test for syphilis.

To prevent the potential hazards blood was taken from the pregnant women by a qualified health professional using the following precautions: vacu-tainer tubes, disposable syringes, needles, gloves and soaked cotton with alcohol were used. All women were assured that they had the right to accept the study or to reject it without jeopardizing their care.

#### Monitoring of data collection

Every morning and afternoon the interviewers, and laboratory technician met with the principal investigator and reported the results of the previous day and the current day.

From data collectors, two males coordinated all data collectors. They met every other day for discussion about ongoing work with the principal investigator. To make smooth and good relationships, discussions with all data collectors, laboratory technicians and interviewers were held with the principal investigator at least every week.

Supervision was made by principal investigator

because daily work activity depended up on the presence of all the team, and absence of a person from a work might seriously affect work activity.

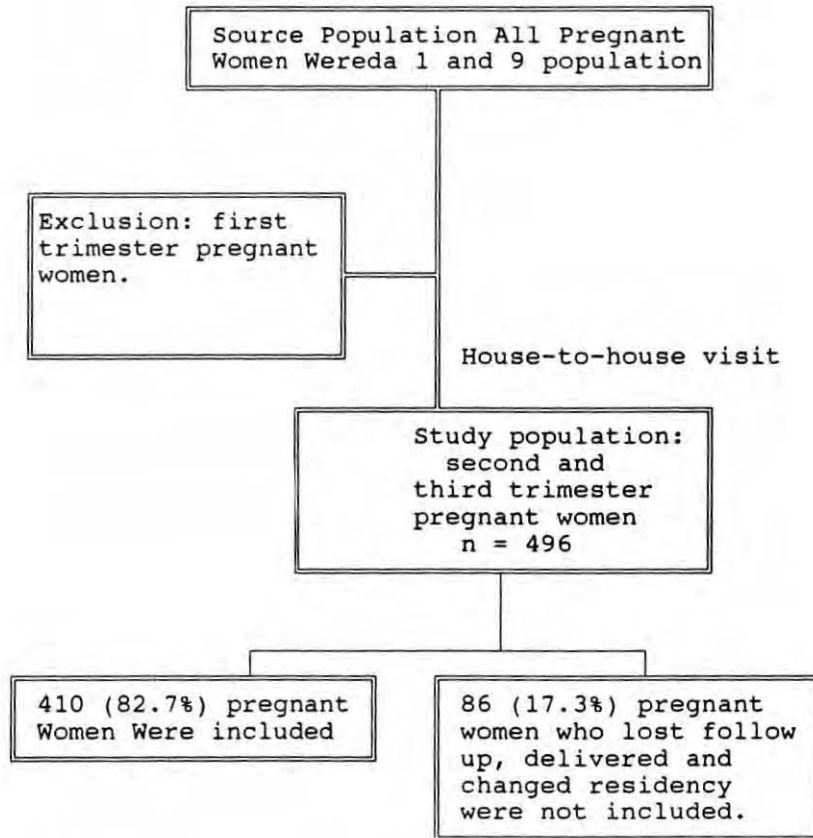


Figure 1: Enrolment of pregnant women.

### Operational Definitions

1. Asymptomatic syphilis - Absence of clinical manifestations of syphilis, but positive rapid plasma reagin (RPR) - test plus positive treponema pallium haemagglutination Assay (TPHA) test.
2. Symptomatic syphilis - clinical manifestations of the existence of syphilis (skin rash, maculae papular, papule- squamous, painless ulcer, lymphadenopathy, mucous membrane lesions including patches) and positive rapid plasma reagin (RPR)- test plus positive treponema palladium haemagglutination assay (TPHA) test.
3. Third trimester - is a pregnant women whose last menstrual period was 6 months or more ago or a women who claims to be 7,8 or 9 months pregnant.
4. Second trimester - is a pregnant women whose last menstrual period was more than three months ago and who claims to be 4,5 or 6 months pregnant.
5. Abortion - interruption of pregnancy before the 28<sup>th</sup> week of pregnancy.
6. Spontaneous abortion - abortion resulting from natural impulse; not caused or suggested from outside.

7. Criminal abortion - abortion performed without any medical or obstetrical permission.
8. Induced abortion - abortion performed by the decision of the doctor due to medical indicators.

### Preparation of Data for Computer Entry

The closed question offers a list of possible options (answers) from which the respondent must select one answer.

For example, in one closed question, the interviewer asked the respondent about the curabilities of each of five STDs in turn.

Question: Indicate the STDs which are currently not curable.

1. Syphilis 1.Yes 2.No 3.I don't know
2. Gonorrhoea 1. " 2." 3. "
3. Chancroid 1. " 2." 3. "
4. Lymphogranuloma venereum 1.Yes 2.No 3.I don't know
5. HIV/AIDS 1.Yes - 2.No - 3.I don't know

The open ended questions asked each respondent to answer in her own words, giving as many responses as she wished. As an example of an open ended question, as one sees in the questionnaire, women were asked to "list the STD's they know".

It was much easier to analyze answers from closed questions because they are already set out in a way suited for analysis.

However, open questions are more difficult to analyze because each respondent answers in her own words, and in her own way, giving information on some aspects not of direct relevance. She may also include answers that are difficult to interpret or understand.

Thus, making some sort of uniform order was necessary before doing the analysis.

Therefore, for each question the answers given by each respondent were listed. Then after almost all answers were compiled by hand, another new question was set out (prepared). That is: 1 yes 0 No

A set of yes/no variables was devised for computer entry. Each variable gave the respondent's answer to one specific item. For example, one open-ended question was "How does one get syphilis?". The answer given were many and in various formats/words. Many women gave more than one. For these responses, we devised 5 yes/no variables, namely:

1. "one can get syphilis by sexual intercourse".
2. "one can get it through heredity".
3. "one can get it through kissing".
4. "one can get it through blood transfusion".
5. "I don't know how one gets syphilis".

For each of the above mentioned causes a code of 0=not mentioned or 1=mentioned was entered.



## 2. Data Entry of EPI-INFO Programme

The coded data were entered into the EPI - INFO programme for data processing.

## 3. Data Analysis

Data analysis was performed in relation to the stated objectives.

For the primary objectives, namely to determine the prevalence of syphilis among pregnant women, prevalence was calculated as the percent of women with a positive RPR - test which was confirmed by a positive TPHA-test. The prevalence was also calculated for the socio-demographic sub groups to determine the distribution of syphilis by age, marital status, education, income, occupation and reproductive history.

Variability in the prevalence across various subgroups was tested by overall chi-square ( $\chi^2$ ) - test for significant association and more sensitive  $\chi^2$  - test for trend when appropriate for variables measured on a numerical (ordered) scale.

For the secondary objectives, namely knowledge regarding STDs were assessed by examination of the frequency of responses to various closed and open-ended questions.

## RESULTS

A total of 11,750 houses were surveyed and 496 pregnant women in the second and third trimester were identified in 16 kebeles of Ketchene Awraja, Addis Ababa. Of these, 410(82.7%) participated in the study. Of the rest, 36(8.8%) were delivered, 8(2%) had changed residence and 42 (8.5%) others agreed to come to the clinic, but could not be found after four subsequent home visits.

### **Socio-Demographic Characteristics of the Respondents**

The socio-demographic characteristics of the respondents are shown in table 1.

The largest numbers of the respondents belonged to the age groups 20-24 (34.6%), 25-29 (24.6%), 15 - 19 (17.3%), 35 - 39 (7.3%) and 40 - 44 (1.5%) respectively. The maximum age group of the pregnant women was forty four years. Some 75.9% and 73.7% reported that they can read and write respectively. Almost 60% had education at or above 5<sup>th</sup> grade, i.e. 5 - 8 grade (27.6%), 9 - 12 (25.6%), >12 grade (5.1%). The rest, about 40% had either gone to the literacy campaign (17.1%), didn't go to school (14.4%) or went to 1 - 4 grade (10.2%). The majority, over 80%, of pregnant women were Christian and Muslim (15.4%). The largest ethnic groups were Amharas

(222), followed by Oromo (77), Gurage (73), Tigre (32). Occupations were classified into six categories by combining related occupations. Most pregnant women were housewives (70.0%) others were workers in private enterprises (8.3%), government workers (7.3%), students (5.9%), housemaids (4.6%), or jobless (3.9%). The frequency distribution of monthly family income was <100 (34.1%), 100>300 (26.6%), don't know (24.1%) and >300 birr (15.1%) respectively. About four-fifths (80.0%) of the respondents were recorded as married.

Table 1. Socio-Demographic Characteristics of 410 Pregnant Women Examined for Syphilis in Ketchene Awraja, Addis Ababa 1992-93.

Variables	Categories	No (%)
1. Age in years	15 - 19	71 (17.3%)
	20 - 24	142 (34.6%)
	25 - 29	101 (24.6%)
	30 - 34	60 (14.6%)
	35 - 39	30 ( 7.3%)
	40 - 44	6 ( 1.5%)
2. Literacy Status	Can read	311 (75.9%)
	Can write	302 (73.7%)
3. Years of Schooling	Didn't go to school	59 (14.4%)
	Literacy campaign	70 (17.1%)
	1 - 4 grade	42 (10.2%)
	5 - 8 "	113 (27.6%)
	9 - 12 "	105 (25.6%)
	> 12 "	21 ( 5.1%)
4. Religion	Orthodox Christian	338 (82.4%)
	Catholic "	2 ( 0.5%)
	Protestant "	7 ( 1.7%)
	Muslim "	63 (15.4%)
5. Ethnicity	Amhara	222 (54.1%)
	Oromo	77 (18.8%)
	Tigre	32 ( 7.8%)
	Gurage	73 (18.5%)
	Others	3 ( 0.7%)
6. Occupation	Housewife	287 (70.0%)
	Student	24 ( 5.9%)
	Housemaid	19 ( 4.6%)
	Jobless	16 ( 3.9%)
	Government workers	30 ( 7.3%)
	Private workers	34 ( 8.3%)
7. Monthly average family income	< 100	140 (34.1%)
	100 > 300	109 (26.6%)
	> 300	62 (15.1%)
	Don't know	99 (24.0%)
8. Marital status	Singles(never married)	34 ( 8.3%)
	Married	328 (80.0%)
	Divorced	13 ( 3.2%)
	Widowed	4 ( 1.0%)
	Separated	31 ( 7.6%)

The responses of the 410 pregnant women concerning their reproductive history are shown in table 2.

Over half (51.7%) were in their first or second pregnancy and another quarter (24.6%) in their third or fourth; 10% were in their eighth or more.

Nearly 83% of the women reported never having had abortions. The rest reported having had spontaneous abortion (13.4%), criminal abortion (3.1%) and induced abortion (1.2%). Very few reported having had stillbirths.

Table 2. Reproductive History of 410 Pregnant Women Examined for Syphilis in Ketchene Awraja, Addis Ababa, 1992-93

Variables	Categories	No (%)
Gravida	1 - 2	212 (51.7%)
	3 - 4	101 (24.6%)
	5 - 7	53 (12.9%)
	≥6	44 (10.7%)
Parity	Nulliparous	150 (36.6%)
	1 - 2	139 (33.9%)
	3 - 5	66 (16.0%)
	≥ 6	55 (13.4%)
Number of live births	No live birth	160 (39.0%)
	1 - 2	137 (33.4%)
	3 - 5	62 (15.1%)
	≥6	51 (12.4%)
Abortions	No abortions	339 (82.7%)
	Spontaneous abortion	55 (13.4%)
	Criminal abortion	13 ( 3.1%)
	Induced abortion	5 ( 1.2%)
Number of stillbirths	0	398 (97.1%)
	1	8 ( 2.0%)
	2	2 ( 0.5%)
	3	2 ( 0.5%)

## Knowledge Regarding the Existence of

### STDs:-

Table 3a and 3b show the respondents' knowledge regarding the existence of STD's. The most popular was HIV/AIDS (90%) and the least was LGV (20%). The mean number of STD known by the respondents was 3. Many women gave more than one response, so percentages add to greater than 100%. The percentage who listed three STDs were (45%) followed by four STDs (25.4%), five STD's (14%) one STD (7.1%) two STDs (6.3%) and " don't know" (2%). The central tendency: mean, median and mode of STD's they knew was shown in table 3b.

Table 3a. Knowledge Regarding the Existence of Sexually Transmitted Diseases. Number and percentage of 410 Women who Mentioned this Disease When Asked to List the STD's you Know. Ketchene Awraja, Addis Ababa 1992-3

STD's	No (%)
1. HIV/AIDS	370 (90.2%)
2. Syphilis	366 (89.3%)
3. Gonorrhoea	356 (86.8%)
4. Chancroid	165 (40%)
5. LGV	85 (20%)

Table 3b. Number of STDs Mentioned by 410 Pregnant Women.

Number of STD's	No (%) of respondent
0 STD	8 ( 2.0%)
1 STD	29 ( 7.1%)
2 STD	26 ( 6.3%)
3 STD	185 (45.0%)
4 STD	104 (25.9%)
5 STD	58 (14.0%)
	410 (100%)

### **Knowledge Regarding the Causes of STDs:-**

**Syphilis:-** Pregnant women responded with the following causes: sex (85.1%); followed by heredity (6.1%), kissing; (7.7%), through blood transfusion (3.7%); and those who didn't know any were 11.7%.

**Gonorrhoea:-** Even though most (81.7%) pregnant women responded that gonorrhoea is caused by sexual intercourse, 10.7% reported by contact, others reported that it is caused by urinating facing the sun (8.3%), followed by urinating facing the moon (6.8%), urinating on a hot stone (7.1%) and by toilet seats where dogs urinated (8.8%); those who don't know were 8.8%.

**Chancroid:-** The majority of the pregnant women don't know the causes of chancroid. Those who said it was caused by sex were only 39.3%, the percentage who said they don't know was 58.0%.

**LGV:-** As with chancroid, most pregnant women don't know the causes of LGV. Only a minority (23.4%) responded that LGV is caused by sex, by contact (3.7%).

**HIV/AIDS:-** More than 90% reported that HIV/AIDS is caused by sex. Some 50% reported it is caused by contaminated needles and blades. Some 12.9% and 9.5% reported it is

caused by blood transfusion and untrained local drug injectors respectively. Only 3.2% didn't know any cause of HIV/AIDS.

Table 4. Knowledge of How One Gets STDs. Responses of 410 pregnant women when asked to list Causes you Know of STD's; Ketchene Awraja, Addis Ababa 1992-3.

STD	Cause	No (%)
Syphilis	- sex	349 (85.1%)
	- heredity	25 ( 6.1%)
	- kissing	30 ( 7.7%)
	- through blood transfusion	15 ( 3.7%)
	- I don't know	48 (11.7%)
Gonorrhoea	- sex	335 (81.7%)
	- contact	44 (10.7%)
	- urinating facing the sun	34 (8.3%)
	- urinating facing the moon	28 (6.8%)
	- from sitting on a hot stone	29 (6.8%)
	- Urinating on places where dogs have urinated	36 (8.8%)
	- I do not know	36 (8.8%)
Chancroid	- sex	161 (39.3%)
	- contact	15 ( 3.7%)
	- I don't know	238 (58.0%)
LGV	- sex	96 (23.4%)
	- contact	15 ( 3.7%)
	- I don't know	303 (73.9%)
HIV/AIDS	- sex	382 (93.2%)
	- contaminated needles	153 (37.3%)
	- contaminated blades	110 (26.8%)
	- blood transfusion	53 (12.9%)
	- untrained local drug injector	39 (9.5%)
	- I don't know	13 (3.2%)

## **Knowledge Regarding the Signs/Symptoms of Syphilis**

**Table 5:-**

The women responded when asked the signs/symptoms of syphilis as follows: ulcer (43.2%), rashes (15.6%) nodules (4.9%) and fever (1.7%) respectively.

## **Beliefs/Knowledge Regarding Curability of STD's:-**

Table 6 shows their beliefs/knowledge regarding the curability of STD's. Most responded that syphilis (80.7%) and gonorrhoea (80.7%) are curable; fewer knew that chancroid (46.6%) and LGV (32.2%) are curable. Most women (90%) responded that currently HIV/AIDS is not curable.

Table 5. Knowledge Regarding the Signs of Syphilis: Responses to question "What are the Signs of Syphilis" by 410 pregnant women in Ketchene Awraja, Addis Ababa. 1992 - 1993.

Sign	No. (%) who Mentioned this sign
Ulcer	177 (43.2%)
Rashes	64 (15.6%)
Nodules	20 ( 4.9%)
Fever	7 ( 1.7%)
I don't know	142 (34.6%)

Table 6. Beliefs/ Knowledge Regarding Curability of STD's; Responses to Questions for Each of the Following STD's in Ketchene Awraja, Addis Ababa, 1992 - 1993.

STD	Curable	No (%) of respondents
Syphilis	Yes	331 (80.7%)
	No	21 ( 5.1%)
	I don't Know	58 (14.1%)
Gonorrhoea	Yes	331 (80.7%)
	No	20 ( 4.9%)
	I don't know	59 (14.4%)
Chancroid	Yes	191 (46.6%)
	No	15 ( 3.7%)
	I don't know	204 (49.8%)
LGV	Yes	132 (32.2%)
	No	18 ( 4.4%)
	I don't know	260 (63.4%)
HIV/AIDS	Yes	11 ( 2.7%)
	No	371 (90.5%)
	I don't know	28 ( 6.8%)

### Knowledge Concerning Prevention of STDs (Table):

The responses to the question "how would you prevent STD's" are good. Even though one needs to know their detailed sexual practice, they have knowledge on how to prevent STD's. Almost all respondents mentioned for each of the five STD's the method of condom use and having only one sexual partner. For the prevention of HIV/AIDS, a small percentage also mentioned using sterile medical instruments and health education. For syphilis, gonorrhoea, chancroid and LGV, a few mentioned early diagnosis and treatment, but the majority of pregnant women don't know the prevention method of chancroid and LGV.

Table 7. Knowledge Concerning Prevention of STD's: Responses of 410 Pregnant Women When Asked "How Would you Prevent This STD?" Ketchene Awraja, Addis Ababa 1992-3.

STD	Method	No (%) mentioning this method
HIV/AIDS	Condom use	293 (71.5%)
	One sexual partner	284 (69.3%)
	Using sterile medical instrument	34 ( 8.3%)
	Health education	15 ( 6.1%)
	I don't know	23 ( 5.6%)
Syphilis	Condom use	180 (43.9%)
	One sexual partner	269 (65.6%)
	Early diagnosis & treatment	26 ( 6.3%)
	By washing	10 ( 2.4%)
	I don't know	47 (11.5%)
Gonorrhoea	Condom use	177 (43.2%)
	One sexual partner	233 (56.8%)
	Early diagnosis & treatment	42 (10.2%)
	I don't know	56 (13.7%)
Chancroid	Condom use	102 (24.9%)
	One sexual partner	137 (33.4%)
	By washing	13 ( 3.2%)
	Early diagnosis & treatment	8 ( 2.0%)
	Don't know	192 (46.8%)
LGV	Condom use	57 (13.9%)
	One sexual partner	69 (16.8%)
	Early diagnosis & treatment	15 ( 3.7%)
	Don't know	286 (69.8%)

### **Women's Reactions to statements Concerning STDs:-**

Table 8 shows reactions of 410 pregnant women to statements regarding STD's; reactions were recorded to the following levels of agreement: strongly agree, agree, disagree & strongly disagree. Generally knowledge is quite good and in the appropriate direction. As can be seen in table 9, most pregnant women gave responses more of a social and psychological nature concerning the impact of STD's and their prevention, as follows: Extra-marital sex causes STD's (97.8%), causes unwanted pregnancy (9.0%), causes divorce (8.0%), causes jealousy (7.1%), causes lack of money (4.1%) and causes lack of partner interest. The 18 pregnant women who said " STD's are not dangerous," gave the following reasons: it is a punishment of God (66.7%), prevents promiscuity (55.6%), it stabilises family life (44.4%), it is a co-existence of nature (44.4%) and it prevents population increase (38.9%), for the details see table 9.

Table 8. Responses of 410 Pregnant Women Regarding STD's: Reaction to the Following Statements/ Questions. Ketchene Awraja, Addis Ababa 1992 - 1993.

Statement/Questions	Strongly agree	Agree	Disagree	Strongly disagree
1. STD's are not dangerous	2.7%	2.9%	5.4%	89.0%
2. Local herbs could heal STD's	13.4%	10.2%	12.0%	64.4%
3. Holy water could heal STD's	9.5%	7.8%	8.0%	74.6%
4. Modern medicine can heal STDs better than any other treatment	77.3%	11.5%	2.9%	8.3%
5. A person who gets STD's doesn't need to tell his/her partner	4.1%	1.2%	3.9%	90.7%
6. Vaccination can prevent a person from having STD's	43.2%	11.7%	9.0%	36.1%
7. STD's can be prevented by using condoms	66.0%	9.3%	4.6%	20.0%
8. It is possible for a child of a syphilitic mother to acquire the infection	90.0%	2.9%	2.4%	4.4%
9. A person should keep syphilis as a secret	2.0%	4.6%	-	93.4%
10. If a women gets syphilis while pregnant she should not be treated	2.9%	2.2%	3.4%	91.5%
11. Syphilis can heal by it self	1.2%	0.2%	5.1%	93.4%

Table 9. Responses of 410 Pregnant Women Examined for Syphilis When Asked the Following Questions / Statements in Ketchene Awraja, Addis Ababa. 1992 - 1993.

Question/statement	No of Women responding	Response	No ( %) giving this response
1. Is it dangerous to have extra marital sex?	410	Yes	410 (100.0%)
2. If yes, what is the danger?	410	Causes STD's " jealousy " divorce " lack of money " lack of partner interest " Unwanted pregnancy	401 ( 97.8%) 29 ( 7.1%) 33 ( 8.0%) 17 ( 4.1%) 9 ( 2.2%) 37 ( 9.0%)
3. Where can STDs be best treated	410	At any health institution At any local herbal medicine At any clinic Treated in Borchole clinic (previously it is a centre of STD clinic in A. A.)	298 ( 72.7%) 36 (8.7%) 12 (2.9%) 92 (22.4%)
4. Have you had antenatal care	410	Yes No	296 ( 72.2%) 114 (27.8%)
5. If a person has syphilis does she have a greater chance of HIV/AIDS infection	410	Yes No I don't know	215 ( 52.4%) 28 ( 6.8%) 167 ( 40.7%)
6. If you agree or strongly agree, why are STD's are not dangerous	18	Prevents promiscuity Prevents population increase It stabilises family life It is a co-existence of nature It is a punishment of God	10 ( 55.6%) 7 ( 38.9%) 8 ( 44.4%) 8 ( 44.4%) 12 ( 66.7%)

\* Many Women Gave More Than 1 Response, so percentages add to >100%

### **Prevalence of Syphilis:**

For the prevalence of syphilis, results among pregnant women by RPR-test in table 10 showed 11% positive, and 7.1% positive by TPHA confirmatory test.

### **Magnitude of Asymptomatic Syphilis:**

Table 11 shows the magnitude of asymptomatic syphilis in pregnant women, together with the positive predictive value of different signs/symptoms, based on interview and physical examination of 410 pregnant women. The positive predictive value of adenopathy, rashes or ulcer for TPHA positivity test is 60%; this is followed by a history of STD positive predictive value 24%, and burning sensation, vaginal discharge or dysuria of positive predictive value 12%. The percentage of TPHA positive women for whom this sign/symptom was not elicited were adenopathy, rashes or ulcer (79%) followed by burning sensation, vaginal discharge or dysuria (76%) and history of STD (55%) respectively.

Table 10. Prevalence of Serological Test Results Among 410 Pregnant Women by RPR-Test. TPHA - test in those positive by RPR-test in Ketchene Awraja, Addis Ababa 1992 - 1993.

Result	No (%)
RPR positive	45 (11.0%)
RPR positive, TPHA negative	16 ( 3.9%)
RPR positive TPHA positive	29 ( 7.1%)

Table 11. Magnitude of Asymptomatic Syphilis in Pregnant Women, Together With the Positive Predictive Value of Different Signs Based on Interview and Physical Examination of 410 Pregnant Women in Ketchene Awraja, Addis Ababa 1992-93

Signs/Symptoms	No (%) of 29 TPHA +ve women for whom this sign/symptom was not elicited	Positive predictive value of this sign/symptom
Adenopathy, rashes, ulcer	23 (79%)	6/10 (60%)
History of STDs	16 (55%)	13/54 (24%)
Burning sensation, discharge or dysuria	22 (76%)	7/57 (12%)

Positive Predictive Value = Percentage of those with positive signs/symptoms who were TPHA +ve.

For Example:- 10 women showed adenopathy, rash or ulcer: 6 of those (or 60%) were TPHA positive.

**Distribution of Syphilis by Socio-Demographic Characteristics:** Distribution of syphilis by socio-demographic characteristics by TPHA examination showed the following results.

Age: as is shown in table 12, there is a positive association of age with TPHA positivity. As the age increases there is an increase of TPHA positivity overall  $\chi^2$  for age is ( $P < 0.05$ ). Analysis for linear trend in proportions showed those in age group of 40-44 have eight times higher risk than the referent age group of 15-19 years.

Literacy status: The prevalence was 6.1% in those who they can read but 12.5% in those who can not. The prevalence in those who say they can write was 5.6% and in those who can't write 13.7, which is relatively statistically significant.

Years of schooling: showed no significant association in relation to TPHA positivity.

Occupation: There is no significant difference in prevalence among different occupations.

There is also no significant association in prevalence among those with different monthly average family income or marital status.

The prevalence of syphilis positivity was associated to parity; this might be confounded by the age of the pregnant women.

Table 12. Distribution of Syphilis by Socio Demographic Characteristics by TPHA Examination Related to in 410 Pregnant Women in Ketchene Awraja, Addis Ababa, 1992-93.

Variables	Categories	No	No (%)		OR
			TPHA positive		
Age in years	15 - 19	71	4 ( 5.6%)	1.00	over all $\chi^2$ P < 0.009
	20 - 24	142	3 ( 2.1%)	0.36	
	25 - 29	101	10 (10.0%)	1.84	
	30 - 34	60	7 (11.7%)	2.21	
	35 - 39	30	3 (10.0%)	1.86	
	40 - 44	6	2 (33.3%)	8.38	
Literacy status	Can read	311	18 ( 6.1%)	NS	
	Can't read	99	11 (12.5%)		
	Can write	302	16 ( 5.6%)		
	Can't write	108	13 (13.7%)		P<0.05*
Years of schooling	Didn't go to school	59	9 (15.3%)	NS	
	Literacy campaign only	70	6 ( 8.6%)		
	1 - 4 grade	42	1 ( 2.4%)		
	5 - 8 "	113	5 ( 4.4%)		
	9 - 12 "	105	7 ( 6.7%)		
	> 12 "	21	1 ( 4.8%)		
Occupation	Housewife	287	19 ( 6.6%)	NS	
	Student	24	2 ( 8.3%)		
	House maid	19	1 ( 5.3%)		
	Jobless	16	1 ( 6.25%)		
	Government workers	30	4 (13.3%)		
	Private workers	34	2 ( 5.9%)		
Monthly average family income in birr	< 100	140	15 (10.7%)	NS	
	100 > 300	109	5 ( 4.6%)		
	> 300	62	4 ( 6.5%)		
	Don't know	99	5 ( 5.1%)		
Marital status	Single (never married)	34	4 (11.8%)	NS	
	Married	328	20 ( 6.1%)		
	Divorced	13	1 ( 7.7%)		
	Widowed	4	0 -		
	Separated	31	4 (13%)		

S=Non Significant, \*= Significant, 1US Dollar=5 Eth.Birr.

Table 13. Distribution of Syphilis by TPHA Examination related to Reproductive History in 410 Pregnant Women in Ketchene Awraja, Addis Ababa, 1992 - 1993.

Variables	Categories	No	No (%) +ve N= 29	P-value
Gravida	1 - 2	212	10 ( 4.7%)	NS
	3 - 4	101	8 ( 7.9%)	
	5 - 7	80	10 (12.5%)	
	≥ 8	17	1 ( 5.9%)	
Para	No para	150	9 ( 6.0%)	p<0.05*
	1 - 2	139	5 ( 3.6%)	
	3 - 5	98	14 (14.3%)	
	≥ 6	23	1 ( 4.3%)	
Abortions	No abortions	339	21 ( 6.2%)	NS
	Spontaneous abortions	55	7 (12.7%)	
	Criminal abortion	13	1 ( 7.7%)	
	Induced abortion	5	0 ( - )	
Number of stillbirths	0	398	28 ( 7.0%)	NS
	1	8	0 ( - )	
	2	2	1 (50.0%)	
	3	2	0 ( - )	

NS=Non significant      \*=Significant

**Knowledge Scores Regarding Causes, Curability,**

**Prevention of STDs':-**

Knowledge scores regarding the causes, curability and prevention of STDs are shown in tables 14, 15 and 16 respectively.

For each STD, scores reflect the number of accurate answers the respondent listed, minus the number of inaccurate answers in knowledge of gonorrhoea causes.

Table 14. Knowledge Scores\* Regarding "how one gets STDs" Among the Respondents of Pregnant Women in Ketchene Awraja, Addis baba, 1992 - 1993.

STD	Scores	No of women	Percent
HIV/AIDS	0	13	3.2
	1	266	55.1
	2	66	16.1
	3	63	15.4
	4	20	4.9
	5	22	5.9
Syphilis	0	44	10.7
	1	322	78.5
	2	38	9.3
	3	3	0.7
	4	3	0.7
Gonorrhoea	- 3	1	0.2
	- 2	9	2.2
	- 1	28	6.8
	0	59	14.4
	1	289	70.5
	2	24	5.9
Chancroid	0	240	58.5
	1	164	40.0
	2	6	1.5
LGV	0	303	73.9
	1	103	25.0
	2	4	1.0

\* Score reflects number of accurate answers the respondent listed minus the number of inaccurate answers.

Table 15. Knowledge Scores for the "Curability of STD's" Respondents by 410 Pregnant Women in Ketchene Awraja Addis Ababa, 1992 - 1993

Scores	No	Percent
0	17	4.1
2	45	11.0
3	31	7.6
4	96	23.4
5	101	24.6

\* Score reflects number of accurate answers the respondent listed.

Table 16. Knowledge Regarding for the "prevention of STDs'" Among 410 Pregnant Women in Ketchene Awraja, Addis Ababa. 1992 - 1993.

STD's	Scores	No of women	Percent
HIV/AIDS	0	22	5.4
	1	182	44.4
	2	180	43.9
	3	10	2.4
	4	16	3.9
Syphilis	0	46	11.2
	1	253	61.7
	2	104	25.4
	3	5	1.2
	4	1	0.2
	5	1	0.2
Chancroid	0	189	46.1
	1	186	45.4
	2	32	7.8
	3	2	0.5
	4	1	0.2
LGV	0	287	70.0
	1	107	26.1
	2	14	3.4
	3	2	0.5

\* Score reflects number of accurate answers the respondents listed

## DISCUSSION

The main purpose of this study was to determine the prevalence rate of syphilis and to determine the distribution of syphilis by socio-demographic characteristics among second and third trimester pregnant women. The second objective was to assess the knowledge of pregnant women regarding STDs with emphasis on syphilis, and to measure the magnitude of asymptomatic syphilis in pregnant women.

According to the findings of this study the response rate was found to be relatively high 82.7% and a refusal rate of only 8.5%. Even though a refusal rate of 8.5% seems to be not low, it should be interpreted with caution. The representativeness of the sample can be considered to be fair.

In this study the prevalence of syphilis was first identified to be 11% by RPR-test and subsequently 7% by TPHA confirmatory test. Other studies have also reported similar findings (24,20,21,22).

In Ethiopia the serious consequences of syphilis for the pregnant women as well as for the newborn was not documented until 1970. In 1970 Larson ( 25 ) reported that of all pregnant women and their babies admitted to a MCH centre in Addis Ababa, slightly more than 15% had positive serological test results for syphilis; 21% of the liveborn children from mothers who were positive had

clinical signs of congenital syphilis.

After the Larson report, only one study was conducted in Addis Ababa among pregnant women. This revealed lower results than that Larson's, 12.7% for RPR and 10.9% for TPHA (24).

This present study revealed some significant differences of distribution of syphilis in different socio-demographic characteristics:

1. Age - This study revealed that there is a significant variation in with TPHA-positivity ( $P < 0.05$ ). Relatively younger age groups are less affected by syphilis than those of older age groups. This might be because of the cumulative effect of prevalence of syphilis which didn't get adequate treatment at the time of infection. Among factors influencing the frequency of sexually transmitted diseases, age distribution of a population has a major influence on the prevalence of STD's ( 1 ).

2. Occupation - Studies among prostitutes in the past have revealed that certain occupations are significantly associated with STD's ( 32 ). This study didn't reveal any significance difference among occupations. This might be due to the relative homogeneity of the study population with regards to marital status, 80% being married.

3. Income - Average monthly family income also didn't reveal any significant association with STD's. It might

be because many don't know their husband's wage. It might be considered that in a poor country like Ethiopia which has low average monthly family income, better indicators of economic status such as family size, house ownership and living conditions, should be considered.

4. Literacy status - There was significantly higher prevalence of syphilis in those who cannot write than in those who can ( $p < 0.05$ ).

5. Marital status - For the various categories of marital status there is no significant association. But the TPHA positive rate is higher (11%) among the combined group of single, divorced, widowed and separated compared with the 6.1% rate in those who are married.

6. Reproductive history - The prevalence of syphilis was significantly associated with parity, which might be because of confounding by the age of the pregnant women.

7. Knowledge - Knowledge regarding the existence of STD's was relatively high for HIV/AIDS (90.2%), syphilis (89.3%) and gonorrhoea (86.8%). Other STDs like chancroid (40%) and LGV (20%) were much less known. Particularly for the causes of gonorrhoea there are some wrong beliefs such as that it is caused by urinating facing the sun, urinating facing the moon, urinating where dogs have urinated, and is caused by sitting on a hot stone.

The majority of pregnant women responded that syphilis and gonorrhoea are curable but chancroid and LGV

were less known by the respondents; most pregnant women also responded that currently HIV/AIDS is not curable. This means that knowledge regarding curability of STD's was generally inadequate. Knowledge concerning prevention of STD's was moderately good.

One alarming finding is that there is no difference between those who have high knowledge and low knowledge of STD's in their rates of TPHA positivity. Therefore, searching for other means of behavioral change among the community is important for intervention methods. Depending on knowledge alone about most STD's is not sufficient to bring about behavioral change related to its transmission or prevention, and perception of self-risk (33).

Recently in 1993 Workneh Feleke and Helmut Kloos (2) reported that in Ethiopia public awareness of syphilis ("kitign" in Amharic) and gonorrhoea ("chebt") appears to be fairly high, but that of knowledge of the other STD's is poor, and that public knowledge about the prevention of all STD's is good.

The magnitude of asymptomatic syphilis was high. Also the positive predictive value of adenopathy, rashes or ulcer for TPHA positivity was 60%. A history of STD had a positive predictive value of only (24%) while a burning sensation, vaginal discharge or dysuria had a positive predictive value of only 12%.

Of the 29 TPHA positive women 79% did not have adenopathy, rashes or ulcer; 76% did not complain of burning sensation, vaginal discharge or dysuria and 55% had no history of STDs.

In a study performed in South Africa to evaluate the rate of detecting asymptomatic bacteriuria and endo cervical infections in the black prenatal patients attending King Edward VII Hospital (KEH), Durban, a serological test for sexually transmitted disease showed the presence of syphilis to be 7.6% (6).

#### Limitation of the Study

The fact that health workers were used as interviewers might have introduced a desirability or non-

response bias is possible, especially in assessing the knowledge of the study subjects. This limitation, however, was not substantial and was thus unlikely to have affected the validity of this study. In order to avoid having respondents feel guilty questions were asked indirectly in the third person rather than in relation to their own sexual practice.

Other difficulties were the problem of identifying first trimester pregnant women and the willingness of pregnant women to participate in this study.

Nevertheless, the results of this study should be interpreted with caution as the study is a cross sectional study.

#### Validity of the Study

Pregnant women of second and third trimester were included in the study.

Considering the values of medical ethics and the precautions concerning reaction of people regarding STD's, health workers were selected for the interviewing who avoid anxiety and give subjects freedom to report information more fully.

Interviewers who were known to be honest, and diligent and willing to face difficulties that may arise during the time of the interview were selected as interviewers. The pregnant women were also assured that

any information concerning them would never be passed to any individual or institution without their consent. For confidentiality their addresses and study numbers (code numbers) were recorded, but their names were not. Privacy was insured for every pregnant woman during physical examination, blood drawing and interviewing.

Even though Ketchene awraja is the smallest awraja (4.1 sq. kilometres) in Addis Ababa, in many aspects it is similar to many districts according to the health profile of districts in Addis Ababa. Therefore, these findings might be representative for those kebeles which are accessible to Addis Ababa.

Of course, the findings of this study are not applicable for the rural Ethiopian situations where socio-demographic characteristics and health services are quite different.

This study also needs careful interpretation and cautious generalization to all the urban female population. It must be remembered that the study was done for pregnant women and the majority were married women. Therefore, the generalizability should be addressed by further study.

## CONCLUSIONS AND RECOMMENDATIONS

This study was conducted in Ketchene Awraja, Addis Ababa. It is a community-based study among randomly selected second and third trimester pregnant women, to determine the prevalence of syphilis and to assess knowledge of pregnant women regarding STDs with emphasis on syphilis.

Prevalence of syphilis was found to be high by the RPR-test and by the TPHA confirmatory test.

Knowledge regarding the existence of STDs was generally high, but knowledge regarding curability and prevention of STDs are inadequate, particularly in relation to chancroid and LGV.

The magnitude of asymptomatic syphilis in pregnant women, based on interviews and physical examinations, was high. The positive predictive values for those who have signs/symptoms of adenopathy, rashes, ulcers, burning sensation, vaginal discharge, or dysuria were quite low.

According to the above mentioned results, syphilis is still a major public health problem which needs great efforts to increase the awareness of the community through all possible ways of communication.

Syphilis is a part of STDs. STDs are now established as a leading world wide public health problem. For example, the rapid increase in the pandemic HIV/AIDS is

creating a shocking situation all over the world particularly in developing countries like Ethiopia. Therefore, to interrupt the transmission of sexually transmitted infections and their consequences. Thus based on the findings of this study the following recommendations are given.

Recommendations:-

1. Screening for syphilis using at least the RPR test should be a routine procedure in pregnant women, as it is less expensive than TPHA-test.
2. Vaginal examinations and swabs should be done routinely during antenatal and family planning sessions using Gram stains and Wet-mount preparations.
3. Regular check-ups for STDs and contact tracing must be introduced.
4. The STD control programme, including early diagnosis and treatment, should be strengthened.
5. At the national level the role of the mass-media in imparting information about the use of condoms in prevention of STDs should be strengthen.
6. The activities of religious organizations in providing information should be strengthen to their respective followers about the transmission and prevention of STDs, with emphasis on the importance of a mutually faithful sexual relation-ship and if possible, to propagate the use of condoms.

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## APPENDIX 1a

Consent form (English translation)

Thank you for allowing us to share your precious time for a brief discussion about a study to be conducted in Ketchene Awraja, Addis Ababa.

This study will be conducted in a total of 474 randomly selected second and third pregnant women from 16 Kebeles . Only pregnant women who fulfil the criteria for inclusion into the study have been selected randomly (by chance) to participate in the study.

The study will involve physical examination, laboratory examination and interview.

You have a full right to participate throughout, to discontinue at any time you feel like doing so, or never to participate in the study.

Are you willing to participate in the study.

Yes \_\_\_\_\_.

No \_\_\_\_\_.

## APPENDIX 1b

### Questionnaire for STDs among Pregnant Women

Study No \_\_\_\_\_

Date \_\_\_\_\_

Code No of interviewer \_\_\_\_\_

#### IDENTIFICATION

1. Address
  1. Kefitegna \_\_\_\_\_
  2. Kebele \_\_\_\_\_
  3. House No \_\_\_\_\_
2. Age \_\_\_\_\_ Years
3. Literacy status
  1. can read      1. Yes \_\_\_\_\_      2. No \_\_\_\_\_
  2. can write.    1. Yes \_\_\_\_\_      2. No \_\_\_\_\_
4. How many years of schooling (circle one)
  1. didn't go to school
  2. went to literacy campaign
  3. 1-4 grade
  4. 5-8 grade
  5. 9-12 grade
  6. > 12 grade
5. Religion (circle one)
  1. Orthodox Christian
  2. Catholic Christian
  3. Protestant Christian
  4. Muslim
  5. Others, specify \_\_\_\_\_
6. Ethnicity (circle one)
  1. Amhara
  2. Oromo
  3. Tigre
  4. Gurage
  5. Others, specify \_\_\_\_\_

7. Occupation (circle one)

1. housewife
2. student
3. housemaid
4. jobless
5. other, specify \_\_\_\_\_

8. What is your monthly average income \_\_\_\_\_

9. Marital status (circle one)

1. single (never married)
2. married
3. divorced
4. widowed
5. separated
6. others, specify \_\_\_\_\_

10. Reproductive status (write in number in the given space)

1. Gravida \_\_\_\_\_
2. Para \_\_\_\_\_
3. Number of live Births \_\_\_\_\_
4. Number of abortions \_\_\_\_\_
5. Number of spontaneous abortions \_\_\_\_\_
6. Number of induced abortions \_\_\_\_\_
7. Number of criminal abortions \_\_\_\_\_
8. Number of malformed children \_\_\_\_\_
9. Number of Stillbirth children \_\_\_\_\_

Please, may I ask you what you know concerning STDs

11. List the sexually transmitted diseases you know

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12. How does one get

A. Syphilis \_\_\_\_\_

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B. Gonorrhoea \_\_\_\_\_

---

---

C. Chancroid \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

D. LGV \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E. HIV/AIDS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. How would you prevent

A. Syphilis \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. Gonorrhoea \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

C. chancroid \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

D. LGV \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E. HIV/AIDS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. Indicate the STDs which are currently not curable (circle one)

- |               |            |           |                     |
|---------------|------------|-----------|---------------------|
| 1. syphilis   | 1. Yes ___ | 2. No ___ | 3. I Don't Know ___ |
| 2. gonorrhoea | 1. Yes ___ | 2. No ___ | 3. I Don't Know ___ |
| 3. chancroid  | 1. Yes ___ | 2. No ___ | 3. I Don't Know ___ |
| 4. LGV        | 1. Yes ___ | 2. No ___ | 3. I Don't Know ___ |
| 5. HIV/AIDS   | 1. Yes ___ | 2. No ___ | 3. I Don't Know ___ |

Now, I am going to ask you your opinion.

15. STDs are not dangerous (circle one), I agree or strongly agree go to number 17.

1. strongly agree
2. agree
3. disagree
4. strongly disagree

16. If you disagree or strongly disagree what is the danger ?

1. for the mothers
2. for the children
3. for the partner
4. all of the above
5. 1 and 2 are true
6. 1 and 3 are true
7. 2 and 3 are true

17. If you agree or strongly agree why not dangerous ?

---

---

---

18. Is it dangerous to have extramarital sex ?

1. Yes \_\_\_\_\_
2. No \_\_\_\_\_

19. If yes, what is the danger ?

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---

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20. Where can STDs be best treated

---

---

---

21. Herbal medicine can heal STDs (circle one)

1. strongly agree
2. agree
3. disagree
4. strongly disagree

22. Holy water can heal STDs (circle one)

1. strongly agree
2. agree
3. disagree
4. strongly disagree

23. Can modern medicine heal STDs better than any medicine

1. strongly agree
2. agree

- 3. disagree
- 4. strongly disagree

24. Vaccinations can prevent a person from having STDs (circle one)

- 1. strongly agree
- 2. agree
- 3. disagree
- 4. strongly disagree

25. A person who gets STDs doesn't need to tell his/her partner (circle one)

- 1. strongly agree
- 2. agree
- 3. disagree
- 4. strongly disagree

26. STDs can be prevented by using condoms (circle one)

- 1. strongly agree
- 2. agree
- 3. disagree
- 4. strongly disagree

27. If you have taken any drugs for any diseases during the past three months, list the name of the drugs.

---

---

---

28. How many months pregnant are you ? \_\_\_\_\_

29. Have you had antenatal care 1. Yes \_\_\_\_ 2. No \_\_\_\_\_

30. If yes, what kind of antenatal care did you have ?

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---

Now please, may I ask you about syphilis.

31. What are the signs/symptoms of syphilis ?

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32. A person who has a syphilis should keep as a secret (circle one)

- 1. strongly agree
- 2. agree

3. disagree
  4. strongly disagree
33. Syphilis can heal by itself
1. strongly agree
  2. agree
  3. disagree
  4. strongly disagree
34. If a pregnant woman gets syphilis, she should not be treated
1. strongly agree
  2. agree
  3. disagree
  4. strongly disagree
35. If a person has syphilis, does she/he have a greater chance of HIV/AIDS infection ?
1. Yes \_\_\_\_\_
  2. No \_\_\_\_\_
  3. I don't know \_\_\_\_\_
36. It is possible for a child of a syphilitic mother to acquire the infection (circle one)
1. strongly agree
  2. agree
  3. disagree
  4. strongly disagree

**DECLARATION**

I, the undersigned declare this thesis is my original work and has not be presented for a degree in this or any other university and that all sources of materials used for this thesis have been duly acknowledged.

Name Dr. Daba Masissa  
Signature ~~ADD~~  
Place Addis Ababa University  
Date of submission May, 1993

This thesis has been submitted for examination with my approval as University Advisors.

Prof. Dennis Carlson *fn*

Prof. James Hanley James Hanley