
GLOBAL
PROGRAMME
ON **AIDS**

GLOBAL PREVALENCE AND INCIDENCE
OF SELECTED CURABLE SEXUALLY TRANSMITTED
DISEASES: OVERVIEW AND ESTIMATES



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This distribution of the 'Global Prevalence and Incidence of Selected Curable Sexually Transmitted Diseases: Overview and Estimates' has attached to it annex 1 which is the method used to calculate the estimates.

These estimates are based on mid-1995 calculations, which are the latest that WHO and UNAIDS have. The next expected update on Global STD estimates is mid-1998.

These estimates have been distributed with the support of UNAIDS.

This document contains WHO estimates of the prevalence and incidence of some of the curable sexually transmitted diseases (STDs), based on information published in the world scientific literature and in WHO archives. The methodology used was developed by the Office of STD of the WHO Global Programme on AIDS in collaboration with the Rockefeller Foundation, and is the first WHO attempt to estimate STD incidence based on epidemiological modelling. As more data on STD become available, the WHO database will be updated and estimates will be refined.

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SELECTED CURABLE SEXUALLY TRANSMITTED DISEASES:
OVERVIEW AND ESTIMATES**

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An overview of selected curable sexually transmitted diseases

Introduction

Sexually transmitted diseases (STDs) are among the most common causes of illness in the world and have far-reaching health, social and economic consequences. In addition to their sheer magnitude, STDs are a major public health problem for two additional reasons: their serious sequelae, and the fact that they facilitate transmission of HIV.

STDs take a great toll on health through their sequelae, i.e. conditions resulting from the spread of STD pathogens from the point of infection, usually the genital region, to another part of the reproductive tract, such as the fallopian tubes in women. Sequelae of some sexually transmitted diseases, in particular gonorrhoea and chlamydial infection which cause pelvic inflammatory disease in women, impair the fertility of both men and women. Another sequela of these same STDs is increased risk of ectopic pregnancy, a condition that can kill from sudden and severe internal bleeding following rupture of the fallopian tube.

Some STDs attack the fetus and infant as well. In two-thirds or more of pregnant women with early syphilis, for example, the infection spreads through the placenta and infects the fetus and because of this up to one-half of syphilis-infected pregnancies end in spontaneous abortion, stillbirth, or perinatal death. Gonorrhoea or chlamydial infection may likewise infect the eyes of babies as they pass through the cervix and vagina during birth, while chlamydial infection may spread to the lungs of newborns, resulting in chlamydial pneumonia.

Young adults between 15 and 19 years of age often have high rates of STD and present a particularly important problem because of their lack of easy access to STD services and condoms, and their frequent and multiple casual sex partners.

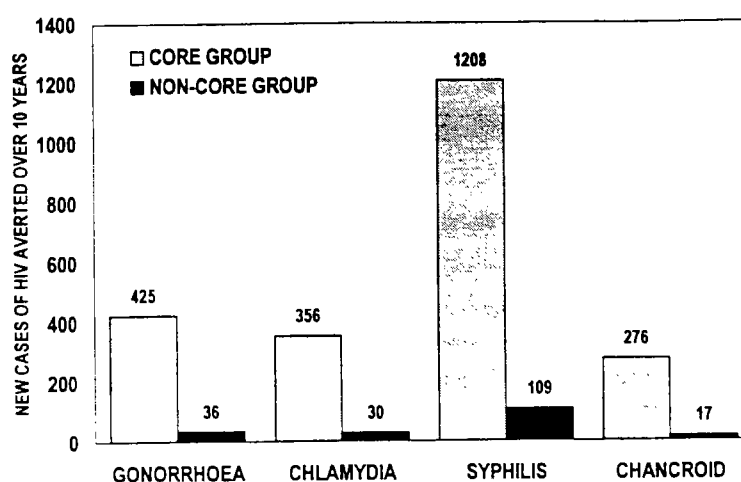
Because sexually transmitted diseases and their sequelae have such a widespread effect – on men, women, youth and newborns – the problem of curable STDs is costly to individuals and the health care system. The World Bank has estimated that STDs collectively rank second in importance among diseases for which intervention is possible among women 15-44 years of age worldwide,¹ and that four curable STDs – gonorrhoea, chlamydial infection, syphilis and chancroid – rank among the top 25 causes of healthy days of life lost in sub-Saharan Africa.²

Biological factors of the curable STDs which increase the risk of HIV transmission and infection include disruption of the normal epithelial barrier by genital ulceration and/or micro-ulceration; and by accumulation of pools of HIV-susceptible or HIV-infected cells (lymphocytes and macrophages) in semen and vaginal secretions. Epidemiological studies from sub-Saharan Africa, Europe and North America have suggested that there is approximately, a four times greater risk of becoming HIV-infected in the presence of a genital ulcer such as caused by syphilis and/or chancroid; and a significant though lesser increased risk in the presence of STDs such as gonorrhoea, chlamydial infection and trichomoniasis which cause local accumulations of lymphocytes and macrophages.³

An estimate of the impact of curing or preventing each of the curable STDs has been made by Over and Piot.² The model used suggests that by curing or preventing one hundred cases of syphilis among an STD high-risk (core) group, approximately 1,200 HIV infections linked to those one hundred episodes of syphilis could be prevented over the coming 10-year period (Figure 1). For other curable STDs the impact of treatment and prevention is significant, though somewhat less.

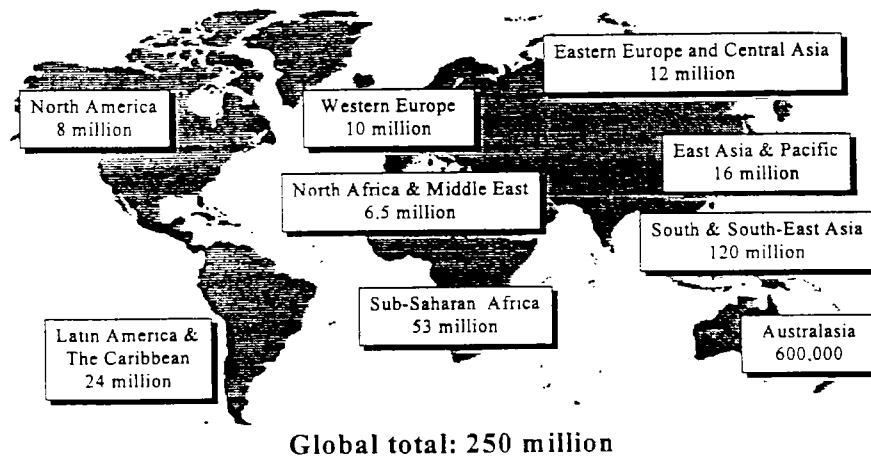
Figure 1

**Effects on HIV epidemic of curing/preventing
100 STD cases in core and non-core groups**



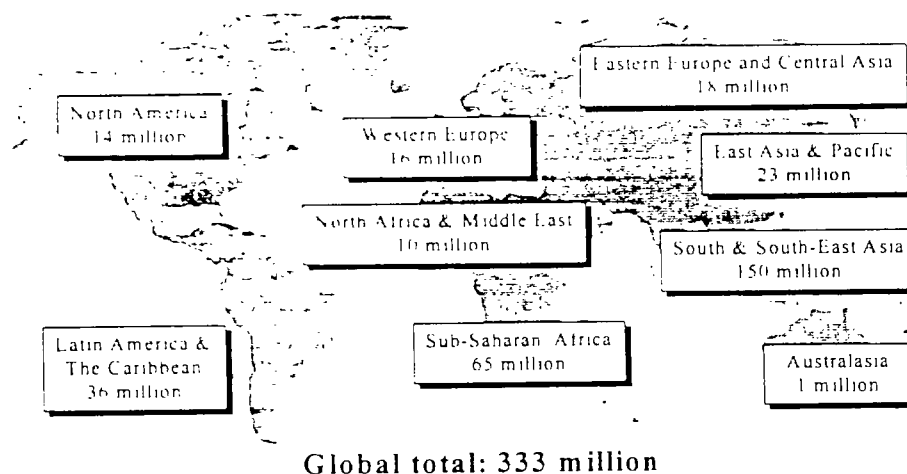
In 1990, using a modified Delphi technique, WHO estimated that in that year there were over 250 million new cases of sexually transmitted diseases. The Delphi technique was chosen at that time because of the lack of information on STDs in many regions. Recently there has been an increase in publications on STD prevalence in developing countries in Africa, Asia, Latin America and the Caribbean. Using this information, and information from other sources such as official STD prevalence estimates from industrialized countries and WHO archival information from country-specific reports, prevalence rates of gonorrhoea, chlamydial infection, syphilis and trichomoniasis were estimated by sex and by (UN standard) region.⁴

Regional adult prevalence for 1995 was calculated using mid-year population estimates of adults 15-49 years of age (Figure 2). Because of a lack of published and archival information on chancroid, no estimates of this disease using this methodology could be made. Likewise, estimates were not made for the viral STDs such as herpes, human papillomavirus and hepatitis B.

Figure 2**Estimated prevalence of curable STD* among adults, mid-1995**

* Gonorrhoea, chlamydial infection, syphilis and trichomoniasis

The next step was to estimate the duration of each infection by sex and by region. These estimates were based on the probability of a symptomatic or an asymptomatic person getting treatment for his/her STD. Regional adult STD incidence for 1995 was calculated by dividing the estimated prevalence by the estimated duration of each disease. The results are shown in Figure 3. Table 1 summarizes population, prevalence and incidence data by region.

Figure 3**Estimated new cases of curable STD* among adults, 1995**

* Gonorrhoea, chlamydial infection, syphilis and trichomoniasis

Table 1: Estimated prevalence and annual incidence of curable STDs by region

Region	Population 15-49 (millions)	Prevalence (millions)	Prevalence per/1000	Annual Incidence (millions)	Annual Incidence per/1000
North America	153	8	52	14	91
Western Europe	211	10	45	16	77
Australasia	11	0.6	52	1	91
Latin America and the Caribbean	251	24	95	36	145
Sub-Saharan Africa	254	53	208	65	254
Northern Africa and Middle East	163	6.5	40	10	60
Eastern Europe and Central Asia	158	12	75	18	112
East Asia and Pacific	803	16	19	23	28
South and South East-Asia	943	120	128	150	160
Total	2,946	250	85	333	113

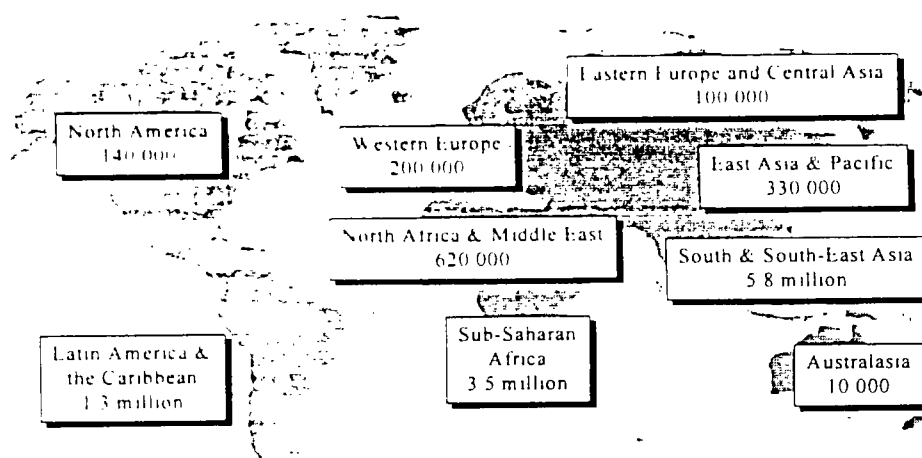
A more complete description of the methodology used to estimate STD prevalence and incidence is available upon request from the WHO Global Programme on AIDS.

Syphilis estimates, 1995

During 1995 it is estimated that there will be approximately 12 million new cases of syphilis among adults worldwide, with the greatest number of cases occurring in South and South-East Asia followed by sub-Saharan Africa (Figure 4).

Figure 4

Estimated new cases of syphilis among adults, 1995



Global total: 12 million

Facts about syphilis

Syphilis was first described in the sixteenth century. In industrialized countries syphilis apparently declined during the latter half of the nineteenth century. In these same countries, however, there was a sharp rise in incidence after the First World War, but following the Second World War the incidence fell rapidly, coinciding with the availability of improved diagnostic tests and antibiotics. In some industrialized countries syphilis began to rise again in the 1960s and has been increasing steadily in some industrialized and developing countries since then.

Syphilis is the classic example of an STD which can be successfully controlled by public health measures: a simple-to-use and highly sensitive diagnostic test is available, as is a highly effective antibiotic to which resistance has not developed. If untreated, however, syphilis may lead to nerve damage, arterial wall damage, and mental disorientation, and eventually to death.

Treponema pallidum, the causative agent of syphilis, can cross the placental barrier and infect the fetus. There is evidence that in approximately two-thirds of pregnancies, infection spreads across the placental barrier, and that many of these pregnancies end in spontaneous abortion, stillbirth, or perinatal death. Congenital defects may occur in those fetuses which go to term and are delivered. In a study in Ethiopia, for example, pregnant women with a positive serological test for syphilis were shown to have a five times greater chance of having a spontaneous abortion or stillbirth than those who were serologically negative;⁵ while in Zambia, 24% of stillbirths could be attributed to syphilis, and congenital syphilis was implicated in 30% of all perinatal infant mortality.⁶

It is generally observed that the incidence of syphilis, as reported by the number of cases treated each year, is highest among the 15-30-year-old group and those persons with the greatest sexual activity, and that incidence decreases with age. Based on reports of new cases of syphilis treated in Chile in 1993, for example, the highest incidence was among 20-24-year-olds, followed by those 25-29 years of age; 15-24-year-olds represented 40% of all cases (Figure 5).⁷

Figure 5

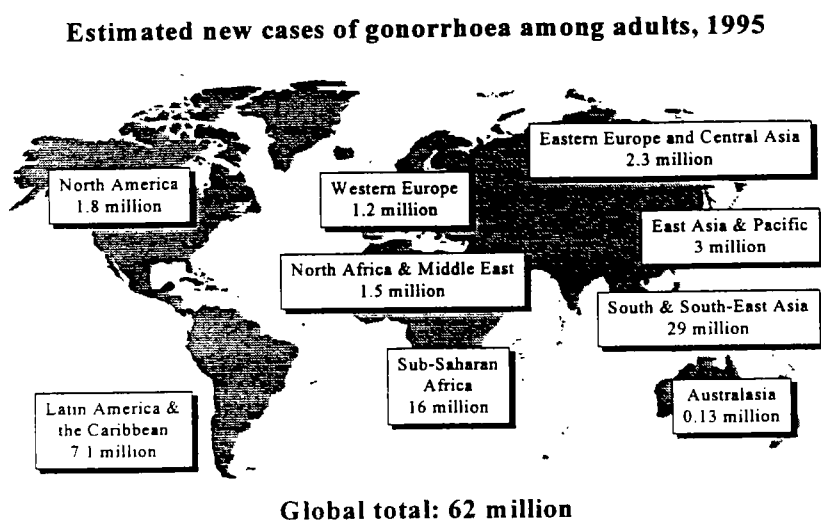
Incidence of syphilis in Chile, by age group, 1993



Gonorrhoea estimates, 1995

During 1995 it is estimated that there will be approximately 62 million new cases of gonorrhoea among adults worldwide, with the greatest number in South and South-East Asia followed, as for syphilis, by sub-Saharan Africa (Figure 6).

Figure 6



Facts about gonorrhoea

Gonorrhoea is a common adult disease, though a significant proportion of those with infection (up to 80% among women, 10% among men) are asymptomatic, i.e., they do not have symptoms and therefore they are neither aware of the need for treatment nor of the risk of transmitting the disease to others.

Infected men usually have symptoms and seek treatment spontaneously. Women frequently have only minor symptoms or are asymptomatic, so detection of infection depends mainly on screening by culture, which is costly and requires relatively sophisticated facilities. Few countries operate regular screening programmes and therefore gonorrhoea reporting seldom reflects true levels of infection. Coinfection with chlamydia is very common and treatment with antibiotics is simple and highly effective.

WHO estimates that by successfully treating 100 women for gonorrhoea, among whom one-quarter are pregnant, 25 would be prevented from developing pelvic inflammatory disease and 7 of their newborns would be spared from ophthalmia neonatorum, an eye infection acquired during passage through the birth canal which, if untreated, can result in blindness (Table 2). Serious sequelae such as ectopic pregnancy, chronic pelvic pain and infertility could also be averted by treatment of these women.

Table 2:

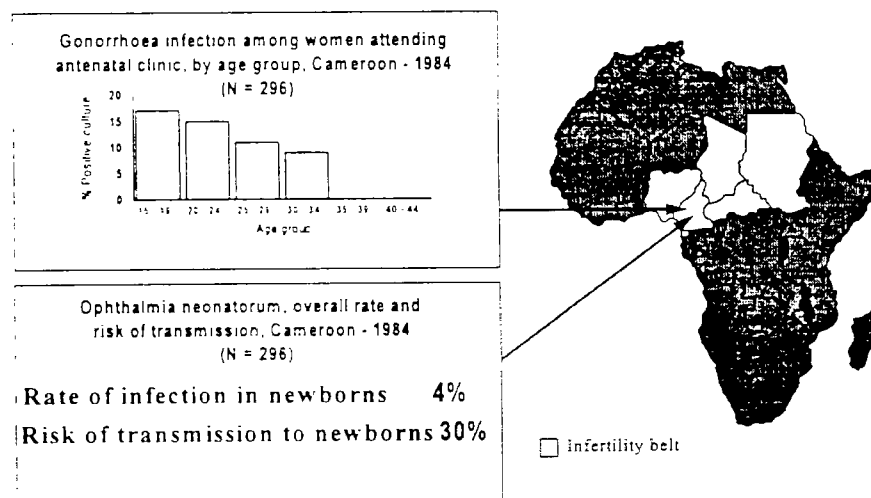
**Morbidity prevented by treating 100 women
(25% pregnant) for gonorrhoea**

	Number of cases averted
Pelvic inflammatory disease	25
Ectopic pregnancy	1
Infertility	6
Ophthalmia neonatorum	7

The complications and sequelae of gonococcal infection have been clearly demonstrated in reports from Cameroon in the mid-1980s, when up to 30% of newborns to women infected with gonorrhoea at the time of delivery developed ophthalmia neonatorum, leading to an overall rate of ophthalmia neonatorum of 4% among all births (Figure 7)⁸. The lighter section of the map in Figure 8 shows the infertility belt in West and Central Africa, where up to 40% of women over the age of 45 years have been unable to conceive, due in large part to STD-induced infertility among young women, the potential of which is demonstrated by the 17% rate of gonococcal infection among women attending antenatal clinics in Cameroon in 1984.

Figure 7

Gonorrhoea, infertility and ophthalmia neonatorum in Africa



Estimates of chlamydial infection, 1995

During 1995 it is estimated that there will be approximately 89 million new adult chlamydial infections worldwide, again with the greatest number in South and South-East Asia followed, as for syphilis and gonorrhoea, by sub-Saharan Africa (Figure 8).

Figure 8

Estimated new cases of chlamydial infections among adults, 1995

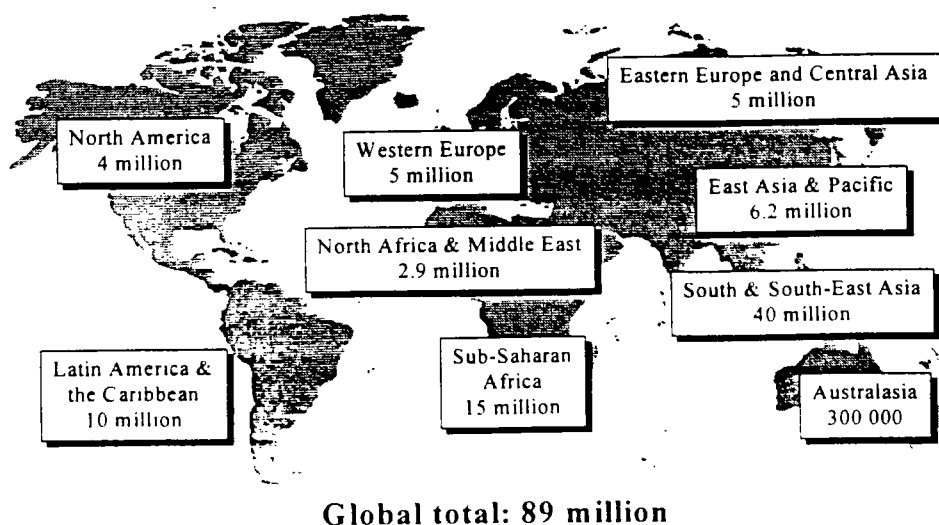


Figure 9

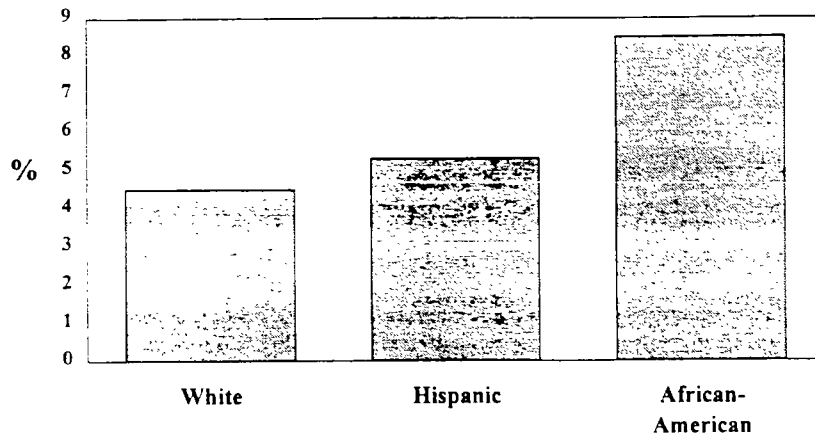
Facts about chlamydial infection

Chlamydial infection, like gonorrhoea, is a common adult disease which has asymptomatic rates in women similar to those for gonorrhoea, but higher rates of asymptomatic infection than gonorrhoea in men. Like gonorrhoea, chlamydia has serious sequelae such as pelvic inflammatory disease and infertility. Diagnosis of chlamydial infection is costly and those diagnostic tests which are most sensitive are not generally available in developing country laboratories. Even in industrialized countries laboratory testing is not available in all health facilities, and screening programmes in women at risk of infection are therefore not consistently conducted. As many infections are neither detected nor treated, prevalence rates are high.

Recently developed laboratory tests have, however, made screening programmes for chlamydial infection possible in some industrialized countries. Rates of infection among women attending family planning clinics from 1989 to 1993 in the United States of America, for example, have been shown to vary from 4.5% to 8.5%. (Figure 9)⁹

Figure 9

**Prevalence of chlamydial infection among clients of family planning clinics
United States, 1989-1993**

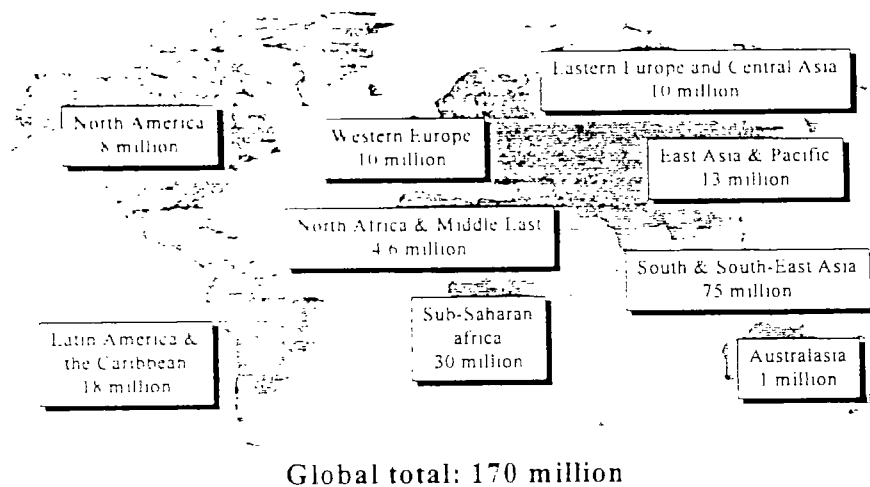


Trichomoniasis estimates, 1995

During 1995 it is estimated that there will be approximately 170 million new cases of trichomoniasis among adults worldwide, with the greatest numbers in developing countries and higher prevalence and incidence rates than for any other STDs in both developing and industrialized countries (Figure 10).

Figure 10

Estimated new cases of trichomoniasis among adults, 1995



Facts about trichomoniasis

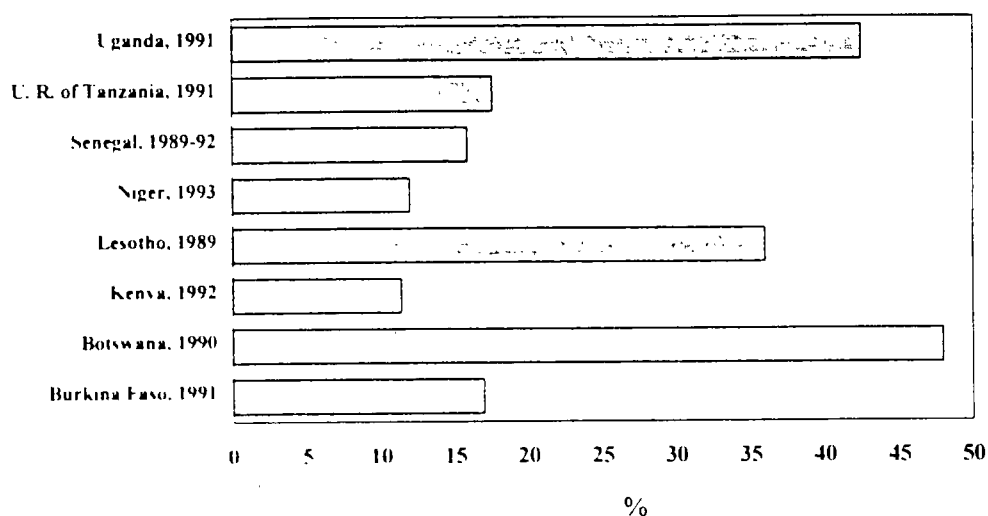
Trichomoniasis is one of the most common STDs. It causes symptoms in approximately 50% of infected women. In men, infection is usually urethral and of short duration, but men easily transmit the parasite to women during the short period when they are infected. Diagnosis is made by a wet mount preparation of vaginal or urethral discharge using an ordinary light microscope, and can also be made by culture, a more costly and less widely available test.

There is little recently published information on trichomoniasis, and that which is available is mainly from studies in sub-Saharan Africa. Prospective studies in Malawi and in Zaire have shown an association of the disease with HIV seroconversion in women. These findings, along with its high prevalence worldwide, indicate the attention which must be given to trichomoniasis, a disease for which diagnosis is simple and treatment effective.

Prevalence rates of trichomoniasis among African women attending antenatal clinics, range from 12% in Kenya to 47% in Botswana (Figure 11).¹⁰⁻¹⁶

Figure 11

Prevalence of trichomoniasis in pregnant women attending antenatal clinics, Africa, 1989-1993



Prevalence studies of trichomoniasis among male and female secondary school students in Kenya (1991) and Nigeria (1993) ranged from a low of 1.3% in Kenya¹⁷ to a high of 24.7% in Nigeria.¹⁸

Chancroid

No estimates of chancroid were made using the methodology developed for syphilis, gonorrhoea, chlamydial infection and trichomoniasis. Poor understanding of the epidemiology and natural history of the disease and the absence of a good test make it difficult to undertake prevalence studies and to estimate prevalence and duration of infection.

An idea of the magnitude of the chancroid problem can, however, be provided based on the ratio of syphilis to chancroid in the previous WHO (Delphi) estimates for syphilis and chancroid, and the 1995 estimate for syphilis. Such a comparison suggests that there may be approximately 7 million new cases of chancroid during 1995. As more published data on chancroid becomes available these estimates will be refined.

Facts about chancroid

The genital ulcers produced by chancroid are a major risk factor for HIV transmission, and the incidence of chancroid varies greatly between countries and regions. For example in Swaziland and Kenya 44% (1979)¹⁹ and 62% (1980)²⁰ respectively of genital ulcers were diagnosed as chancroid in STD clinics. In western Algeria chancroid is the most common STD observed and the primary cause of genital ulcer disease.²¹

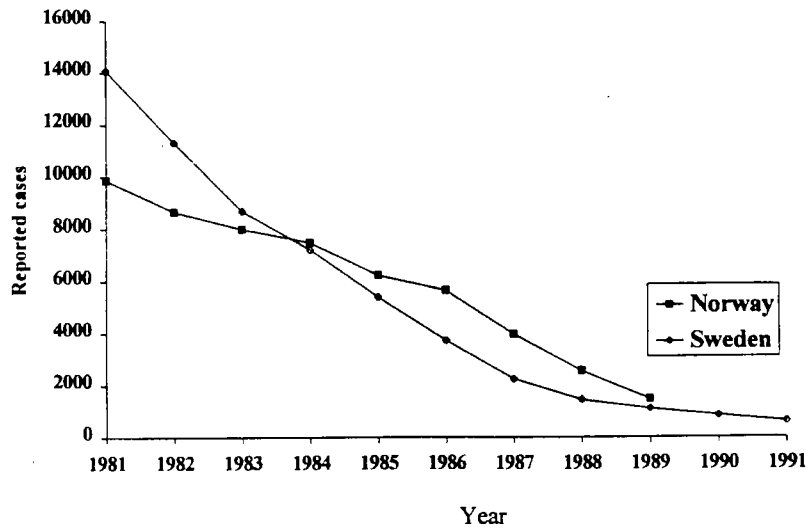
Studies among female commercial sex workers in Kenya in 1992 showed that 30% have evidence of having had chancroid infection, as compared to 2% of women attending antenatal clinics.²² In India in 1989, chancroid represented 26% of all reported STD. In Latin America and the Caribbean the prevalence of chancroid varies from region to region. In some areas, e.g. French Guyana and northern Brazil, it is reportedly a common cause of genital ulcers. In most industrialized countries chancroid has become rare. With the development of new tests, the diagnosis of chancroid will be easier and more information on its prevalence will become available.

Towards the twenty-first century

Though STDs remain a severe public health problem, especially in developing countries, progress is being made in their control in each region. For example, reported gonorrhoea in Sweden and Norway, each with over ten thousand reported cases of gonorrhoea in 1981, is now approaching zero (Figure 12).^{23,24}

Figure 12

Reported cases of gonorrhoea, Norway and Sweden



In Costa Rica reported gonorrhoea for both men and women began a steady and sustained decline in 1982, and in Chile reported STDs began to decline in the mid-1980s (Figures 13²⁵ and 14²⁶).

Figure 13

Reported cases of gonorrhoea, by sex, Costa Rica, 1980-1991

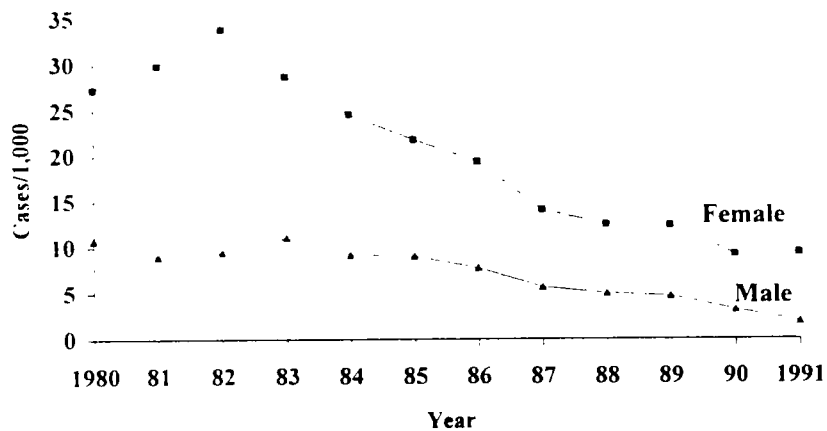
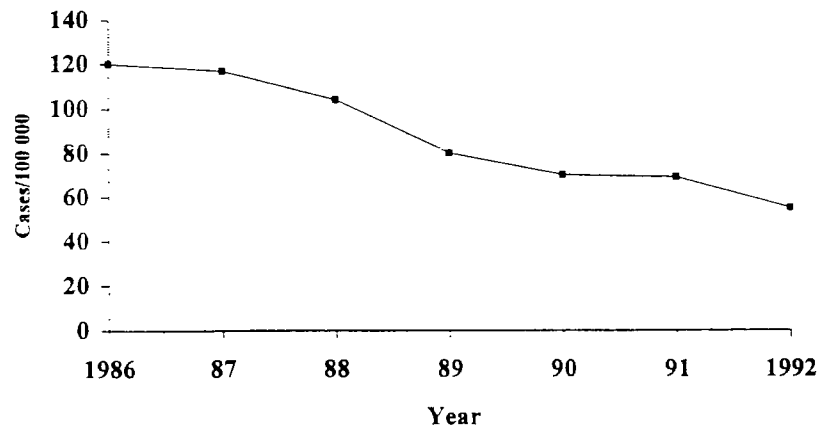


Figure 14

Reported cases of gonorrhoea, Chile, 1986-1992



In Zimbabwe, reported STD in the capital city Harare began a sustained decline in 1991, and in Thailand, declines in reported STD began in 1990 and continue to the present (Figures 15²⁷ and 16²⁸).

Figure 15

Incidence of STD reported from primary health clinics, Harare, Zimbabwe, 1989-1993

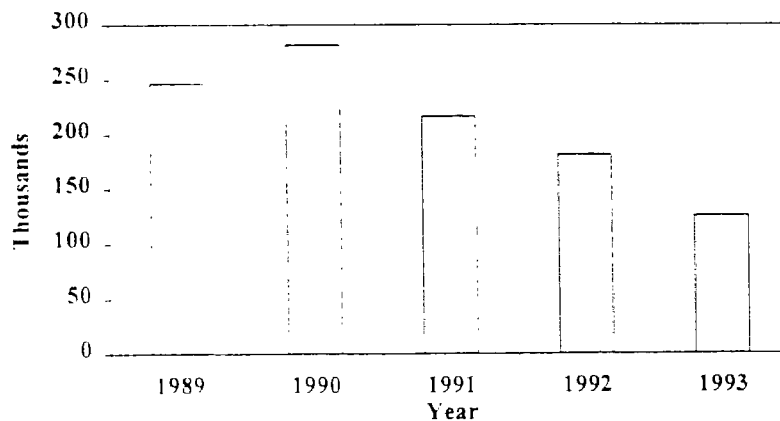
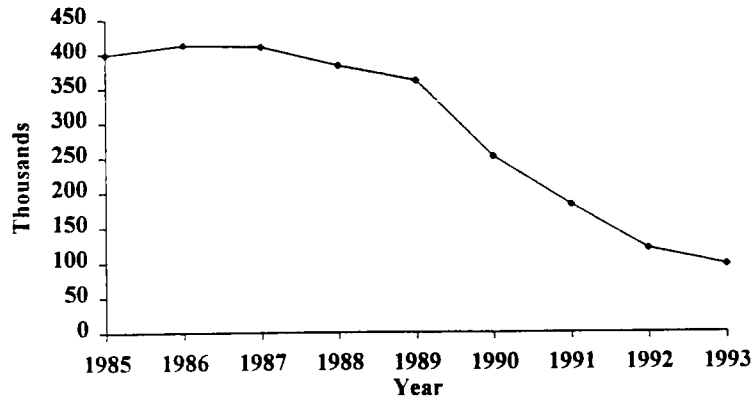


Figure 16

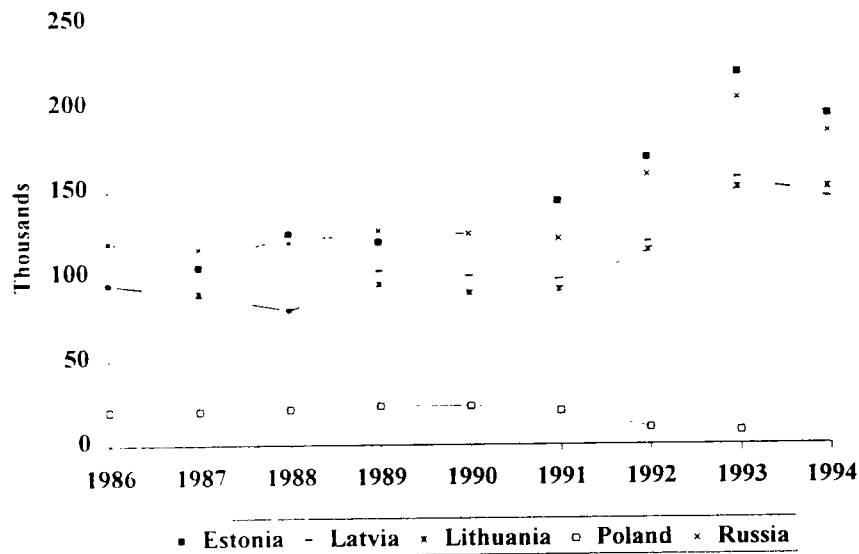
Incidence of reported STDs,
Thailand, 1985-1993



In other regions, however, such as Eastern Europe and Central Asia, the incidence of STDs is increasing. In Estonia, Latvia, Lithuania, and Russia, for example, reported gonorrhoea has increased since 1991. However, in neighbouring Poland, reported gonorrhoea has declined (Figure 17).²⁹⁻³³

Figure 17

Reported cases of gonorrhoea, Eastern Europe,
1986-1994



Examples of information on STDs contained in the WHO database

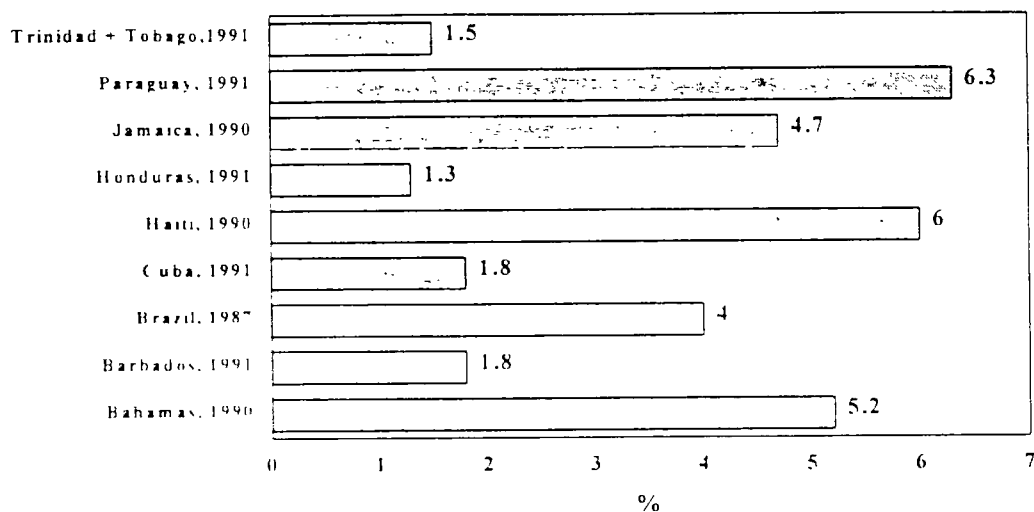
The figures and references which follow are all derived from information contained in the WHO STD database. The figures reflect the variety of sample sizes and of methodologies used to collect this information. As more standardized and refined information becomes available, the WHO estimates will become more accurate.

(1) Syphilis

Information gathered from studies in pregnant women provides a good idea of the prevalence of syphilis in the sexually active general population, and such data are readily available from antenatal syphilis screening programmes. In Latin American and Caribbean countries from which information is available, for example, syphilis prevalence among pregnant women ranged from 1.3% in Honduras to 6.3% in Paraguay in 1991 (Figure 18).³⁴⁻³⁶

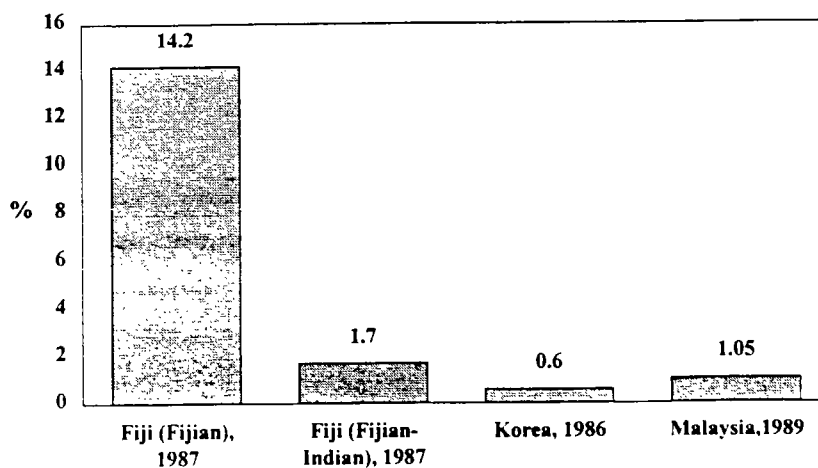
Figure 18

Prevalence of syphilis (positive serological test), pregnant women, Latin America and the Caribbean, 1987-1991



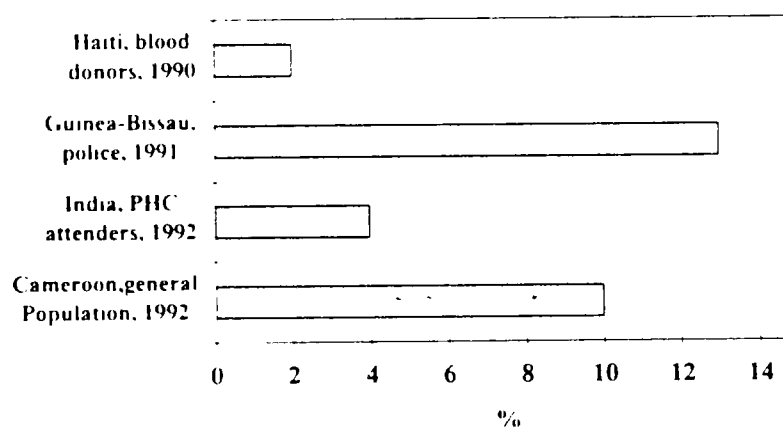
In three countries of East Asia, the Pacific and South and South-East Asia for which data are available, prevalence rates of syphilis among pregnant women range from 0.6% in Korea (1986) to 14.2% in Fiji (1987) (Figure 19).³⁷⁻³⁹

Figure 19
Prevalence of syphilis (positive serological test) in pregnant women, Fiji, Korea and Malaysia, 1987-1989

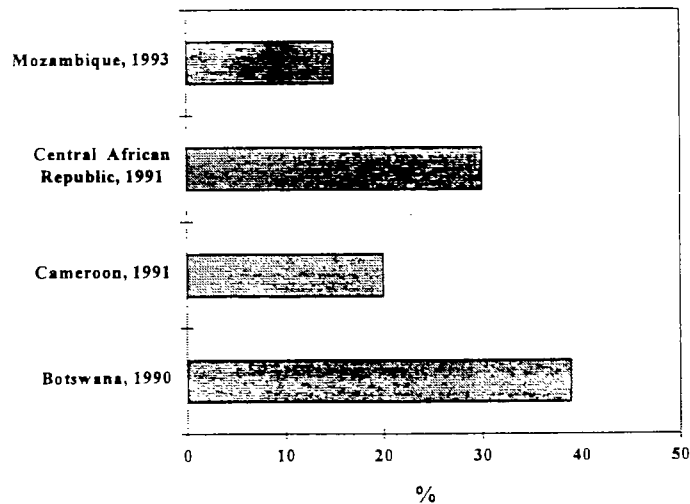


Data showing syphilis prevalence in men representing the general population are scarce. Figure 20^{34, 40-42} shows results from studies carried out in males which also provide, though probably not as reliably as figures for pregnant women, an approximation of syphilis prevalence in the general population.

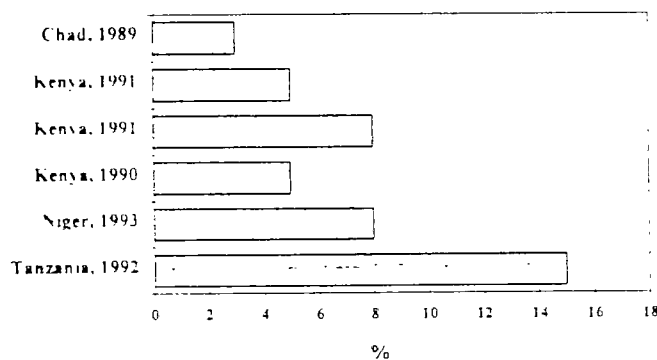
Figure 20
Prevalence of syphilis (positive serological test) in men, 1990-1992



In Figure 21⁴³⁻⁴⁵ syphilis prevalence in men attending STD clinics for any reason and screened for syphilis is shown. In this group, in which the main complaint is not necessarily a genital ulcer, the syphilis prevalence is relatively high, reflecting the frequent association of syphilis with other STDs.

Figure 21**Prevalence of syphilis (positive serological test) in men attending STD Clinics, 1990-1992**

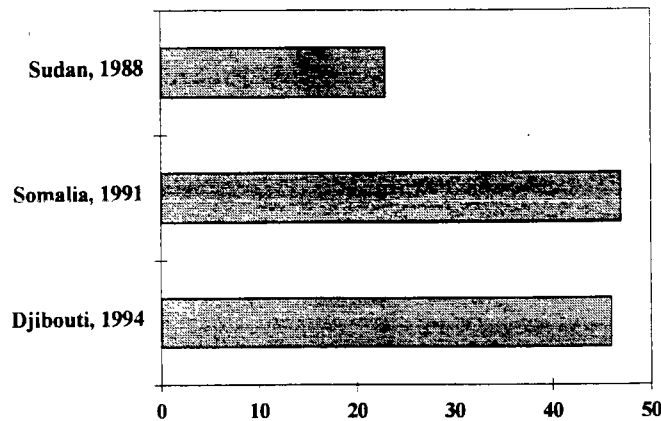
Persons with certain occupations, such as long-distance truck driving and commercial sex work, appear to be at especially high risk of syphilis and other STD. African long-distance truck drivers, for example, have been reported to have prevalence rates of syphilis as high as 15%, placing them at high risk for HIV infection or, if they are already infected, increasing their risk of transmission to others (Figure 22).^{13, 46-50}

Figure 22**Prevalence of syphilis (positive serological test) syphilis in African truck drivers, 1989-1993**

Likewise, commercial sex workers in North Africa and the Middle East have been reported to have high prevalence rates of syphilis: 47% in Somalia (1991), 46% in Djibouti (1994) and 23% in Sudan (1988) (Figure 23).⁵¹⁻⁵⁵

Figure 23

Prevalence of syphilis (positive serological test) in sex workers, Djibouti, Somalia and Sudan, 1988-1994

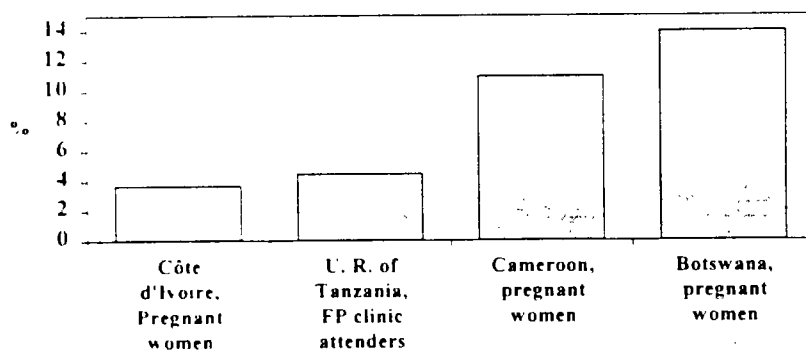


(2) Gonorrhoea

Recent information from studies of pregnant women and family planning clinic attenders in Cameroon and three other sub-Saharan African countries suggests that gonorrhoea remains a priority health problem among women. During the period 1990-1993, for example, prevalence rates of symptomatic and asymptomatic gonorrhoea among women attending antenatal clinics in Cameroon was approximately 12%, and ranged from 3.8% in Côte d'Ivoire to 14% in Botswana (Figure 24).^{50, 54-56}

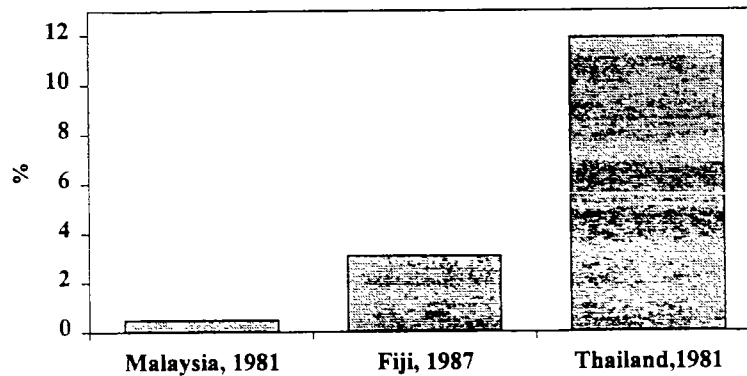
Figure 24

Prevalence of gonorrhoea in pregnant women and family planning attenders, sub-Saharan Africa, 1990-1992



Gonorrhoeal infection among pregnant women is a significant public health problem in South and South-East Asia and the Pacific, where rates in three countries during the 1980s ranged from less than 1% in Malaysia to 12% in Thailand (Figure 25).⁵⁷⁻⁵⁸

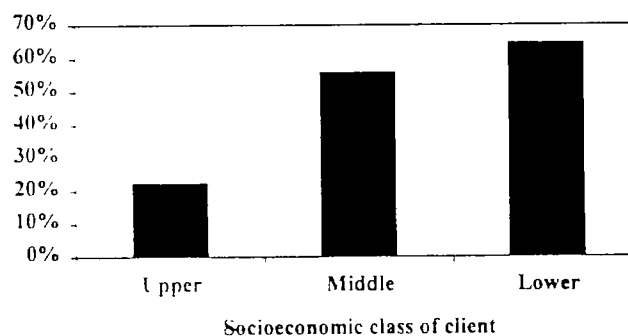
Figure 25
Prevalence of gonorrhoea in pregnant women, South and South-East Asia and the Pacific, 1987-1992



As for syphilis and the other STDs, rates of gonorrhoeal infection are often higher among certain occupational groups. In Kenya, for example, rates of gonorrhoea among female sex workers were shown to be high in 1984, and varied from 20% for sex workers who solicited upper class clients in hotels to 63% among those who solicited clients on the streets (Figure 26).⁵⁹

Figure 26

Gonorrhoea prevalence among sex workers, Kenya, 1984



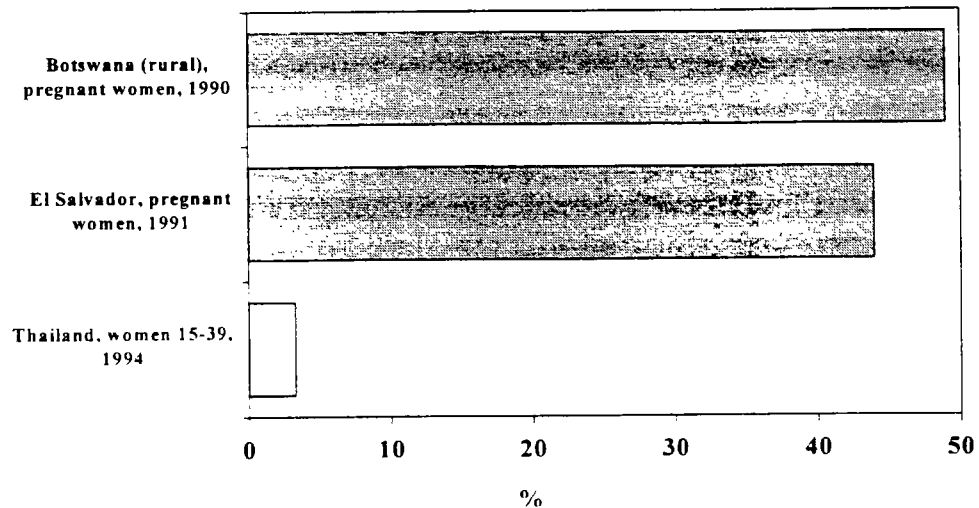
(3) Chlamydial infection

Rates of chlamydial infection in South and South-East Asia, Latin America and the Caribbean, and sub-Saharan Africa are likewise relatively high. Among young women in Thailand, for example, rates have been found to be approximately 3%, much higher than the rate of 0.1% for

gonococcal infection and 0.6% for positive syphilis serology, while rates among pregnant women in El Salvador (1991) have been shown to be as high as 44% and those in rural Botswana (1990) as high as 49% (Figure 27).^{28, 55, 60}

Figure 27

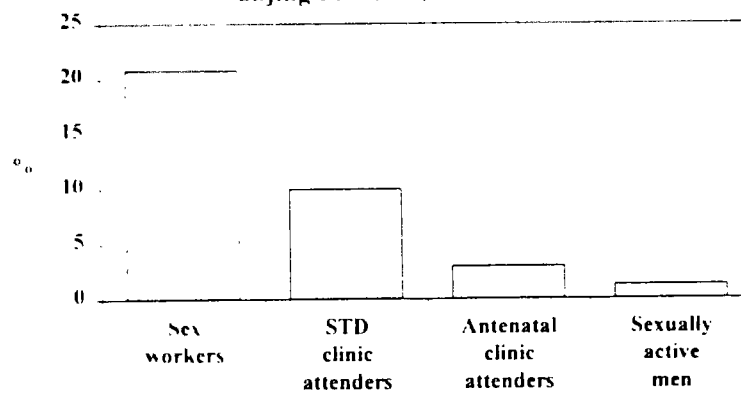
Prevalence of chlamydial infection in women



Rates of chlamydial infection among commercial sex workers are also high in Asia, as shown in Nanjing Province, China, in 1993, where 21% of commercial sex workers were infected as compared to 10% of adults attending STD clinics, 3% of antenatal clinic attenders and 1% of sexually active men (Figure 28).⁶¹

Figure 28

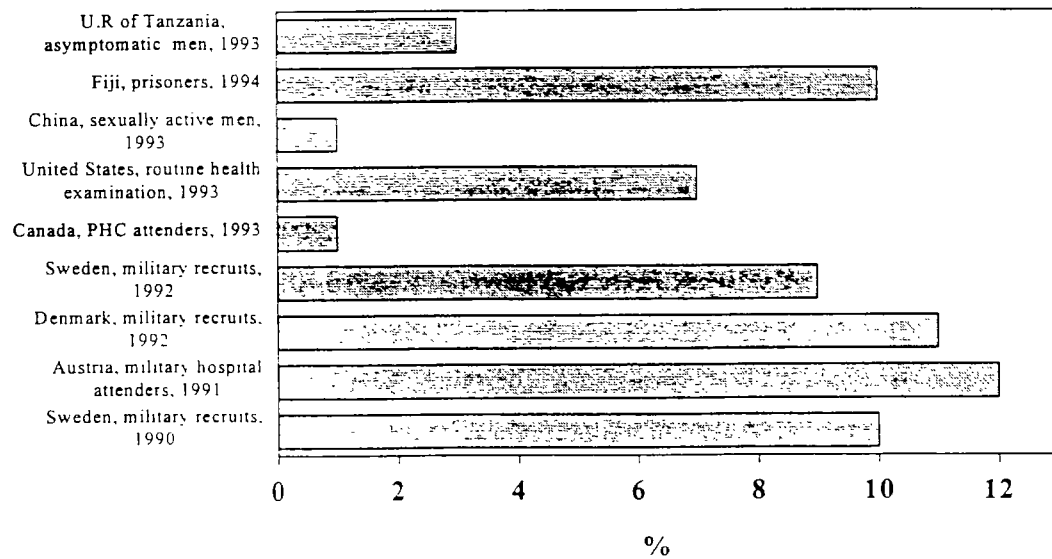
Prevalence of chlamydial infection in different populations, Nanjing Province, China, 1993



Screening in men using ELISA tests also reveals relatively high prevalence rates among different populations and regions, varying from 1% in Canada to 12% in Austria (Figure 29).^{11, 61-69}

Figure 29

Prevalence of chlamydial infection in men, 1990-1994



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GLOBAL
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**Estimates of selected curable sexually transmitted diseases:
a description of the methodology**



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This document provides a detailed description of the methodology used by the World Health Organisation to estimate the incidence of selected curable sexually transmitted diseases. The methodology was developed by the Office of STD of the WHO Global Programme on AIDS in collaboration with the Rockefeller Foundation. This document is meant to supplement the more general WHO document entitled *An Overview of Selected Curable Sexually Transmitted Diseases*, which is now distributed as *Global Prevalence and Incidence of Selected Curable Sexually Transmitted Diseases: Overview and Estimates (WHO/GPA/STD/95.1)*.

Introduction

During the past twenty years, and especially after the onset of the HIV/AIDS epidemic, studies of the prevalence of sexually transmitted diseases (STD) have been conducted in many different countries among populations at varying risk of infection. Though the methodologies and quality of published studies on STD prevalence vary, the published literature does provide an indication of the global extent and distribution of the STD problem, its epidemiology and sequelae.

Previous developing country estimates of four curable STD - gonorrhoea, chlamydial infection, syphilis, chancroid and trichomoniasis - were made by WHO in 1990 using a modified Delphi technique. The Delphi technique was chosen at that time because of the lack of STD information from many regions including sub-Saharan Africa and some parts of Asia. With the recent increase in publications on STD prevalence among adults from developing countries, there is now a greater database of information from studies in Africa, Asia, Latin America and the Caribbean on which more precise regional STD estimates could be based. Using this information, official adult STD prevalence estimates from industrialized countries, and information from other sources, the adult prevalence and incidence of STD worldwide was estimated by first assembling a database of prevalence data by country. Estimates of regional prevalence rates for each curable STD by sex were then made, and prevalence for 1995 calculated using mid year population estimates of adults 15-49 years of age. Estimates of the duration of each infection by sex were then made, and finally regional STD incidence rates and incidence for 1995 were estimated.

Regions for which the estimates were made corresponded to the standard United Nations regions¹ and include: 1) North America, 2) Western Europe, 3) Eastern Europe and Central Asia, 4) Latin America and the Caribbean, 5) Northern Africa and the Middle East, 6) sub-Saharan Africa, 7) East Asia and the Pacific, 8) South and South-Eastern Asia, and 9) Australia.

Assembly of database of published prevalence data

A literature search of major medical journals was conducted for the years 1982-1994 in order to obtain all published prevalence information on syphilis, gonorrhoea, trichomoniasis, chlamydial infection and chancroid among adults. Prevalence data was entered into a specially designed computer database by country, along with the year of the study, number of persons studied by sex, and type of population group from which the prevalence data was obtained (ie pregnant women, STD clinic attenders), with a short summary of the method of diagnosis.

In addition to the literature search, the WHO country files for STD, which contain unpublished and/or confidential information on each member country, were searched and additional prevalence data was likewise entered into the database.

Regional Prevalence estimates

Regional estimates of rates of prevalence of gonorrhoeae, chlamydial infection and syphilis were made by listing prevalence rates from all countries in the region in order of ascending numeric order, by population group, and selecting the median rate as the regional prevalence rate for that particular population group. The median prevalence rate of the population group thought to most reliably represent the general population (in most cases that of pregnant women) was then, in general, considered the regional prevalence rate and regional prevalence was estimated using this rate and the 1995 mid-year UN population estimates for adults of 15-49 years of age. Arbitrarily, trichomoniasis prevalence in women was estimated as being two times chlamydial prevalence because of its known common association with other STD; and trichomoniasis prevalence in men was considered one tenth of the prevalence in women.(tables 1 and 2)

Table 1: Estimated 1995 prevalence (%) of selected curable STD by region, males (15-49).
Males - 15-49

Region	Prevalence			
	Syphilis	Gonorrhoea	Chlamydia	Trichomoniasis
NORTH AMERICA	0.05%	0.14%	0.84%	0.56%
WESTERN EUROPE	0.05%	0.07%	0.76%	0.50%
AUSTRALASIA	0.05%	0.14%	0.84%	0.56%
LATIN AMERICA & THE CARIBBEAN	0.58%	0.63%	2.52%	0.84%
SUB-SAHARAN AFRICA	3.24%	2.02%	5.06%	1.52%
NORTH AFRICA AND MIDDLE EAST	0.43%	0.21%	1.26%	0.34%
EASTERN EUROPE AND CENTRAL ASIA	0.08%	0.34%	1.72%	0.76%
EAST ASIA AND PACIFIC	0.08%	0.10%	0.42%	0.19%
SOUTH AND SOUTH-EAST ASIA	1.44%	1.05%	3.83%	1.02%

Table 2: Estimated 1995 prevalence (%) of selected curable STD by region, females (15-49).
Females (15-49)

Region	Prevalence			
	Syphilis	Gonorrhoea	Chlamydia	Trichomoniasis
NORTH AMERICA	0.05%	0.36%	2.80%	5.60%
WESTERN EUROPE	0.05%	0.18%	2.52%	5.04%
AUSTRALASIA	0.05%	0.36%	2.80%	5.60%
LATIN AMERICA & THE CARIBBEAN	0.72%	1.08%	4.20%	8.40%
SUB-SAHARAN AFRICA	4.05%	2.88%	7.59%	15.18%
NORTH AFRICA AND MIDDLE EAST	0.54%	0.36%	1.68%	3.36%
EASTERN EUROPE AND CENTRAL ASIA	0.08%	0.54%	3.82%	7.64%
EAST ASIA AND PACIFIC	0.10%	0.14%	0.98%	1.95%
SOUTH AND SOUTH-EAST ASIA	1.80%	1.39%	5.10%	10.19%

Exceptions in methodology were made for South and South-East Asia and East Asia and the Pacific where, as a first step, country estimates of rates of prevalence were made for China, India, Japan, New Zealand and Australia using the same methodology as for the regions. Regional estimates were then made by calculating the weighted mean prevalence in these countries and in the remaining group of countries in the region, followed by calculation of the regional prevalence rate. Because prevalence data was based on diagnostic testing in all instances, estimates included both symptomatic and asymptomatic infections.

Because of a very small number of recent published studies on the prevalence of chancroid, no estimates for chancroid prevalence were made. Countries for which there was no published STD information since 1982 were considered to have prevalence similar to neighbour countries.

Duration of infection

Through discussions with experts and reviews of the literature, estimates were made of the duration (in years) of symptomatic and asymptomatic STD among persons who are treated and those who remain untreated, by sex. Estimates were then made of the percentage of STD, by sex, which are asymptomatic.

Next, based on region-specific health system assessment data available from country reports and discussions with national representatives, three different rates of treatment of both symptomatic and asymptomatic infection by sex were estimated; and finally an estimated regional weighted average duration of infection was made, by sex and disease, by multiplying the estimated duration of infection by the percentage of infections which were symptomatic and asymptomatic and the rates of treatment and non-treatment; and then adding the weighted averages for the four different groups (Tables 3 and 4). As for prevalence estimates, separate estimates were made for China, India, Japan, New Zealand and Australia and weighted regional means calculated.

Table 3: Estimated duration of infection (years), Males, 15-49

Region	Years			
	Syphilis	Gonorrhoea	Chlamydia	Trichomoniasis
NORTH AMERICA	0.48	0.12	0.39	0.11
WESTERN EUROPE	0.48	0.12	0.39	0.11
AUSTRALASIA	0.48	0.12	0.39	0.11
LATIN AMERICA & THE CARIBBEAN	1.27	0.23	0.63	0.12
SUB-SAHARAN AFRICA	2.63	0.35	0.92	0.12
NORTH AFRICA AND MIDDLE EAST	1.27	0.23	0.63	0.12
EASTERN EUROPE AND CENTRAL ASIA	1.27	0.23	0.63	0.12
EAST ASIA AND PACIFIC	1.27	0.23	0.63	0.12
SOUTH AND SOUTH-EAST ASIA	2.63	0.35	0.92	0.12

Table 4: Estimated duration of infection (years), Females, 15-49

Females (15-49)	Years			
	Syphilis	Gonorrhoea	Chlamydia	Trichomoniasis
NORTH AMERICA	0.48	0.3	0.91	1.04
WESTERN EUROPE	0.48	0.3	0.91	1.04
AUSTRALASIA	0.48	0.3	0.91	1.04
LATIN AMERICA & THE CARIBBEAN	1.27	0.37	1.03	1.21
SUB-SAHARAN AFRICA	2.63	0.44	1.15	1.37
NORTH AFRICA AND MIDDLE EAST	1.27	0.37	1.03	1.21
EASTERN EUROPE AND CENTRAL ASIA	1.27	0.37	1.03	1.21
EAST ASIA AND PACIFIC	1.27	0.37	1.03	1.21
SOUTH AND SOUTH-EAST ASIA	2.63	0.44	1.15	1.37

Regional Incidence Estimates

Regional adult incidence rates were calculated, by disease and sex, by dividing the regional adult prevalence estimate by the estimated regional weighted average duration of infection. Regional adult incidence was then calculated using the 1995 mid-year regional population estimates for adults 15-49 years of age (Tables 5 and 6).

Table 5: Estimated 1995 incidence (new cases) of selected curable STD, both sexes, 15-49

Regions	New cases per year (million)				
	Syphilis	Gonorrhoea	Chlamydia	Trichomoniasis	Total
NORTH AMERICA	0.14	1.8	4	8	14
WESTERN EUROPE	0.20	1.7	5	10	16
AUSTRALASIA	0.01	0.13	0.3	0.6	1
LATIN AMERICA & THE CARIBBEAN	1.3	7.1	10	18	36
SUB-SAHARAN AFRICA	3.5	16	15	30	65
NORTH AFRICA AND MIDDLE EAST	0.62	1.5	2.9	4.6	10
EASTERN EUROPE AND CENTRAL ASIA	0.1	2.3	5	10	18
EAST ASIA AND PACIFIC	0.33	3.0	6.2	13	23
SOUTH AND SOUTH-EAST ASIA	5.8	29	40	75	150
Total	12	62	89	170	333

Table 6: Estimated 1995 incidence (rates per 1000), of selected curable STD, both sexes, 15-49

Regions	RATES PER 1000				
	Syphilis	Gonorrhoea	Chlamydia	Trichomoniasis	Total
NORTH AMERICA	0.94	11.61	26.11	52.09	90.74
WESTERN EUROPE	0.94	5.80	23.44	46.85	77.04
AUSTRALASIA	0.94	11.60	26.07	52.07	90.69
LATIN AMERICA & THE CARIBBEAN	5.07	28.44	40.18	70.85	144.54
SUB-SAHARAN AFRICA	13.85	61.33	60.55	118.50	254.23
NORTH AFRICA AND MIDDLE EAST	3.79	9.47	18.12	28.36	59.74
EASTERN EUROPE AND CENTRAL ASIA	0.63	14.71	32.04	64.49	111.87
EAST ASIA AND PACIFIC	0.42	3.68	7.76	16.41	28.27
SOUTH AND SOUTH-EAST ASIA	6.14	30.64	42.96	79.84	159.57
Total	4.07	20.89	30.36	57.56	112.88

