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Guidelines for Surveillance of Sexually Transmitted Diseases

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1. INTRODUCTION

Epidemiological surveillance is the ongoing and systematic collection, analysis, interpretation and dissemination of health data in the process of describing and monitoring a health event. This information is used for planning, implementing and evaluating public health interventions and programmes. Surveillance data are used both to determine the need for public health action and to assess the effectiveness of programmes.

In the developing world, sexually transmitted diseases (STDs) are among the most common diseases for which adults seek health care and are the important cause of disease burden in adolescents. The importance of STDs has been raised just very recently when they were found to be a factor that increases the risk of sexual transmission of HIV infection. Furthermore, available evidence clearly shows that prevention and treatment of sexually transmitted diseases can be an important HIV prevention strategy. Thus the need to develop a system for conducting surveillance of STDs is being increasingly felt. More importantly, monitoring of epidemiological situation of sexually transmitted diseases through surveillance process provides crucial information as surrogate indicator useful to assess the situation of HIV/AIDS epidemic. When occurrence of STDs in a country is showing an increasing trend, it indicates the risk of HIV epidemic. On the contrary, if STD prevalence is low and does not show any sign of increasing trend, it is likely that HIV transmission through sexual activity would be low. Thus, surveillance of STDs could be undertaken to complement the HIV/AIDS surveillance system.

Collection of data on STDs is complicated by the fact that STDs are frequently asymptomatic, especially in women. Further difficulties arise because the highest STD prevalence usually occur among marginalized and stigmatized groups of population such as sex workers. Moreover, the stigma attached to these diseases make individuals with these conditions avoid public sector and seek care from the private sector, drug stores or traditional healers.

The objective of this document is to describe the methods and procedures of STD surveillance that can be utilized to monitor the epidemics of STDs and HIV. It will serve as a guideline that can be adapted to the actual circumstances in the countries.

2. OBJECTIVES OF STD SURVEILLANCE

In general, the main aim of STD surveillance is to obtain information on burden of STDs in the population. STD surveillance also aims to determine and describe demographic and geographical distribution of STDs as well as to compare the situation and trends in different demographic and geographical situations. It can be used to monitor trends of STDs among various populations in various geographical areas.

Specifically, STD surveillance is aimed to obtain data that are useful for planning health promotion activities and developing most efficient and cost effective public health interventions. It can also be used to obtain data to be used in the evaluation of interventions and stimulating research, and to assess the impact of STD situation on health care services, which include patient load, supply of STD drugs and the quality of care provided. Usage of STD surveillance also includes monitoring of behaviours related to risk of contracting STDs, health care seeking behaviour in the population and advocacy of HIV/AIDS prevention and control programme.

3. COMPONENTS OF STD SURVEILLANCE

Accurate estimates of the incidence or prevalence of STDs are necessary for a country to develop effective control programmes. Data should be obtained systematically in order to be reliable. Data should not be limited to sexually transmitted diseases in adults, but should also cover the consequences of these diseases, especially their effects on quality of life, reproductive health and on maternal and infant morbidity. To make highest utilization of the surveillance activities, attention should be paid to not only clinical and laboratory data but also to demographic and epidemiological data such as age, sex, parity, maternal status, information on contacts, date of sexual contact and date of onset, etc.

For effective assessment of STD situation, three components of STD surveillance are proposed. These are:

- STD case reporting
- STD prevalence assessment and monitoring
- Specific STD surveillance activities such as
  - Laboratory assessment of antimicrobial resistance
  - Validation of syndromic STD management, and
  - Other special surveys and studies.

These components are complementary to one another although their utility may vary from country to country. The ways in which each of these activities is performed as well as the establishment and development of STD surveillance in a specific country may depend on the legislative framework, health care delivery structures, available resources and the health seeking behaviour of the population in the country. Particular consideration is given to the extent laboratory testing is available for routine clinical care, and on the structure that are already in place for reporting of other communicable diseases.

No single model of STD surveillance could be applicable to all countries. However, STD and HIV/AIDS control programme management should consider the feasibility of these three basic components listed above and adapt them for use in the country.

3.1 STD Case Reporting

STD surveillance has traditionally relied on cases reported by health institutions. It is the process of reporting cases of notifiable diseases from health care providers or laboratories to public health authorities, as the STDs are usually included in the list of notifiable diseases. Such STDs include gonorrhoea, syphilis and chancroid. Case reporting is a fundamental process for most countries in attempting to collect information on the occurrence of diseases.

Facilities providing STD services vary widely in different countries. They may include such facilities as health centres, community hospitals, general hospitals, tertiary care hospitals, medical schools, specialized STD clinics and private practitioners. The STD data should be collected through a reporting system that incorporates all these facilities, with special attention to the private sector from which most of the STD patients seek care. Such a system might

consist of data sets increasing in diagnostic precision with rising levels of clinical and laboratory sophistication, as follows:

- Where there is some clinical expertise, but no laboratory, cases should be classified by clinical syndrome or group of symptoms such as genital ulcer, urethral discharge and vaginal discharge. An example of this type of facilities is community or district hospital.
- Where there is clinical expertise in STD care with laboratory support, reported diagnosis should be based on microscopy, such as latent syphilis, gonococcal or non-gonococcal urethritis, trichomoniasis or candidiasis. Examples of this type of facilities are general or provincial hospital and specialized STD centre.
- Where there is clinical expertise in STD care and medicine subspecialities such as obstetrics and gynaecology or paediatrics with central laboratory support, etiological diagnosis based on laboratory tests can be reported. Examples of this type of facilities are central hospital and medical school.

(1) Syndromic versus etiologic STD case reporting

Cases of STDs may be reported either syndromically or etiologically, depending on the clinical expertise and availability of laboratory tests in clinical care settings. Therefore STD reporting activities can be classified into (1) syndromic case reporting, and (2) etiologic case reporting.

(a) Syndromic case-reporting of STDs

In most countries facilities for etiological diagnosis of STDs may not be available, thus syndromic case-reporting may be the only option for the case reporting. Table 1 lists some selected STD syndromes and their etiologic agents.

Syndromic diagnosis is easy to make and requires no laboratory diagnostic tests; thus it can be adapted for use in all countries.

Selected STD syndromes generally included in the STD case-reporting are: (1) genital ulcer, (2) urethral discharge in men, (3) vaginal discharge, (4) inguinal bubo, (5) lower abdominal pain in women, and (6) scrotal swelling. Each syndrome may represent different diseases caused by different etiologic agents or pathogens.

Table 1: ***Common STD syndromes and their causes***

Syndrome	Etiologic agent
Urethral discharge in male	*Neisseria gonorrhoeae, Chlamydia trachomatis, Ureaplasma urealyticum*
Vaginal discharge	*Neisseria gonorrhoeae, Chlamydia trachomatis, Trichomonas vaginalis, Candida albicans, Gardnerella vaginalis*
Genital ulcer	*Treponema pallidum, Haemophilus ducreyi, Herpes simplex*
Lower abdominal pain in female	*Neisseria gonorrhoeae, Chlamydia trachomatis*
Inguinal bubo	*Chlamydia trachomatis, Haemophilus ducreyi*
Scrotal swelling	*Neisseria gonorrhoeae, Chlamydia trachomatis*
Ophthalmia neonatorum	*Neisseria gonorrhoeae, Chlamydia trachomatis*

Case definitions for STD syndromes that can be used in STD surveillance are:

(1) Genital ulcer is defined as ulcer on penis, scrotum, or rectum in men and labia, vagina, or rectum in women, with or without inguinal adenopathy. This syndrome can be caused by syphilis, chancroid, lymphogranuloma venereum, granuloma inguinale, or genital herpes. In most of the cases, the initial appearance of the ulcer is papule, pustule or vesicle. Such history is essential for the clinical diagnosis especially for genital herpes simplex virus infection of which the ulcers are almost always preceded by typical vesicles.

(2) Urethral discharge is defined as urethral discharge in men with or without dysuria. This syndrome is most commonly caused by *Neisseria gonorrhoeae* and *Chlamydia trachomatis.* Other infectious agents associated with urethral discharge include *Trichomonas vaginalis*, *Ureaplasma urealyticum*, and *Mycoplasma* spp.

(3) Vaginal discharge is defined as abnormal discharge, which is indicated by amount, colour and odour. This syndrome can be with or without lower abdominal pain, or specific symptoms or specific risk factors. This syndrome is most commonly caused by bacterial vaginosis, vulvovaginal candidiasis, and trichomoniasis. It is less frequently caused by gonococcal or chlamydial infection.

(4) Inguinal bubo is a painful, often fluctuant, swelling of the lymph nodes in the inguinal region or groin. The commonest cause of bubo is either lymphogranuloma venereum (LGV) or chancroid, although painless bubo is not uncommon in patients with syphilis. Thus the common organisms causing the syndrome are *Chlamydia trachomatis* and *Hemophilus ducreyi.* Both LGV and chancroidal buboes are generally preceded by genital ulcer. In LGV, ulcer is usually no longer present at the time bubo develops, whereas both symptoms may exist in case of chancroid.

(5) Lower abdominal pain in women is indicated by pain in lower abdomen in women or pain during sexual intercourse, while on examination there may be vaginal discharge, lower abdominal tenderness on palpation, or temperature > 38° C. This syndrome suggests pelvic inflammatory disease, which may be caused by gonococcal, chlamydial, or anaerobic infection.

(6) A common cause of scrotal swelling is the infection of testis, which is a serious complication of gonococcal urethritis and chlamydial urethritis. With acute infection, the testis becomes swollen, hot and very painful. This condition, if untreated or treated late, may lead to infertility due to the destruction of testicular tissue.

STD syndrome case reports have several advantages as well as limitations. The reporting system can be established in all countries, whether with less developed STD programme where syndromic management of STD is the main strategy or with well developed STD facilities where the programme is extended to the most peripheral areas of the country. Urethral discharge and genital ulcer are potentially useful for monitoring trends in STD incidence. These syndromes usually represent recently acquired sexually transmitted infections. Reporting of STD syndromes is useful for management of health services, by providing information on number of cases seen and thus assisting in allocation of drugs. It is also useful for the assessment of the health-seeking behaviour of the population.

Limitations observed in syndromic STD case-reporting is that most of the syndromes do not represent any specific STD. For example, most cases of vaginal discharge, or a substantial proportion of cases of lower abdominal pain in women are not caused by STDs. Besides, some syndromes do not reflect recent infection. For example, vesicular ulcers, an indication of genital herpes simplex virus infection, are usually recurrence of a herpes infection that was acquired years before. Many cases of genital warts also represent a symptomatic recurrence of a persistent infection. In addition, syndromic

report provides a poor assessment of disease burden and trends in women compared to men, because a high proportion of sexually transmitted infections in women causes no symptoms. Because of these limitations, some experts have even suggested that syndromic reporting should be limited to urethral discharge in men and genital ulcer.

(b) Etiologic case-reporting

This type of case-reporting requires laboratory diagnosis. Well developed laboratory support is required for routine STD clinical care. For certain STDs (e.g. syphilis), stage of disease is defined by clinical findings and history, while etiology is diagnosed by laboratory tests.

STD etiologic case definitions are listed below. Depending on the clinical specimen tested and the specificity of the test used, the case may be considered probable or confirmed. All probable and confirmed cases should be reported.

Selected STD etiologic case definitions
Syphilis, primary and secondary

Probable: an illness with ulcers (primary) or mucocutaneous lesions (secondary) and a reactive serologic test (non-treponemal or treponemal).

Confirmed: demonstration of *Treponema pallidum* in clinical specimens by dark-field microscopy, DFA-TP, nucleic acid test or equivalent methods.

Syphilis, latent

Probable: no clinical signs or symptoms of syphilis and (1) a reactive nontreponemal and treponemal test in a patient with no prior syphilis diagnosis; or (2) a nontreponemal test titer demonstrating, four-fold or greater increase from the last nontreponemal test titer in a patient with a prior syphilis diagnosis.

Chancroid

Probable: an illness with genital or anal ulcers with (1) no evidence of *T. pallidum* infection by darkfield examination of ulcer exudate or by a serologic test for syphilis performed $\geq$ 7 days after ulcer onset, and (2) a negative test for herpes simplex virus on ulcer exudate.

Confirmed: identification of *Haemophilus ducreyi* by culture or nucleic acid test in ulcer exudate.

Chlamydia

Confirmed: a positive culture, antigen detection test, or nucleic acid test for *C. trachomatis*.

Gonorrhea

Confirmed: (1) isolation of typical gram-negative, oxidase-positive diplococci (presumptive *Neisseria gonorrhoeae*) from a clinical specimen, (2) demonstration of *N. gonorrhoeae* in a clinical specimen by a nucleic acid test, or (3) observation of gram-negative intracellular diplococci in a urethral smear obtained from a man.

Etiologic case reporting has advantages and limitations. In terms of advantages, it has a high degree of specificity, providing a highly credible assessment of the minimum disease burden and facilitating efforts at counselling and treating patients and their sex partners. Some diseases such as primary or secondary syphilis in men and women, gonorrhea and chlamydia in men indicate recent infection, which is very useful to monitor trend of STDs.

Etiologic STD case reports have serious limitations:

- *Primary and secondary syphilis in men and women, and gonorrhoea in symptomatic men, are the etiologic diagnoses that are most useful for monitoring trends in incidence; many other STDs are not useful for this purpose.* Recently detected latent syphilis in men and women, or chlamydia, gonorrhoea, and trichomoniasis in women usually reflect infections that were acquired at an unknown time earlier. (High quality diagnostic testing is usually not available for chanchroid, otherwise etiologic case reporting for this condition might also be used to reliably monitor trends in incidence).
- *Etiologic reports are generally more useful for monitoring trends in STD incidence in men than in women,* because a higher proportion of infections is symptomatic in men than in women.
- *Sensitivity of diagnostic tests is often substantially < 100 %.* Etiologic reporting does not include syndromes (e.g. genital ulcers) that test negative for a specific pathogen, even though the patient may actually be infected.
- *The availability of diagnostic tests does not assure their quality.* Quality assurance procedures for specimen collection and testing must be in place for diagnostic tests to provide consistent, reliable results.

Most developing countries do not have sufficient laboratory infrastructure for routine etiologic case reporting; however, understanding the requirements of etiologic case definitions can contribute to an understanding of the importance of syndromic case reporting in countries without adequate laboratory facilities.

Etiologic diagnosis based on clinical impression alone, without the use of laboratory diagnostic testing, is not reliable, results in wide variation in reporting practices, and makes any STD surveillance data difficult to interpret.

For this reason, all etiologic case reports require laboratory testing to establish the diagnosis. *In the absence of routinely available, high quality laboratory diagnostic testing, case reporting should be based on syndromes.*

In countries where substantial clinical diagnosis is performed both syndromically and etiologically, some experts believe that a combined system of syndromic and etiologic case reporting may be used, although care should be take to ensure that STD cases occurring in the same individual patients are not reported to both systems. In countries where etiologic diagnosis is performed, multiple infections in the same person can be reported separately (e.g. gonorrhoea and chlamydia).

(2) Reporting perinatally-acquired STDs

Perinatally acquired STDs, which have devastating consequence, can also be reported. Measuring numbers of these infections and their rates (number of infections per number of live births) are important STD surveillance activities. The most common perinatally acquired STDs in most countries are congenital syphilis and ophthalmia neonatorum. Surveillance cases definitions for each of these is shown in the following box.

Case definitions for congenital syphilis and ophthalmia neonaturum

Congenital Syphilis

Probable: (1) an infant whose mother had untreated or inadequately treated syphilis during pregnancy (regardless of signs in the infant), or (2) an infant or child with a reactive treponemal test and any one of the following: evidence of congenital syphilis on physical examination, long bone x-rays compatible with congenital syphilis, a reactive VDRL-CSF, an elevated CSF cell count or protein (without other cause), a reactive FTA-ABS 19S-IgM antibody test, or a reactive IgM ELISA.

Confirmed: Demonstration of T. pallidum by darkfield microscopy, fluorescent antibody, or other specimen stains in specimens from lesions, placenta, umbilical cord, or autopsy material.

Stillbirth: A fetal death that occurs after a 20 week gestation or in which the foetus weighs > 500 g and the mother had untreated or inadequately treated syphilis at delivery.

Ophthalmia neonatorum

Confirmed: conjunctivitis in a newborn, with an ocular specimen that tests positive for N. gonorrhoeae or C. trachomatis

In the absence of diagnostic testing, neonatal conjunctivitis may be reported syndromically using the following definition: conjunctivitis in a newborn who has not received ocular prophylaxis, occurring within two weeks of delivery.

Diagnosis of each of these conditions can be difficult. Diagnosis of congenital syphilis is problematic because not all mothers with untreated or inadequately treated infection will pass the infection to their infants and serological tests for evaluating actual infection of the infant are not widely available. Even more problematic is that it is often difficult to determine whether a mother who has a reactive syphilis serological test has untreated syphilis, or has received adequate treatment. Syphilis in the mother cannot be confirmed without the use of treponemal tests (MHA-TP or FTA-ABS), and these tests are not routinely available in many developing countries.

Surveillance for ophthalmia neonatorum can be difficult even for infants born in hospitals because the symptoms appear after the infant has left the hospital. Gonococcal ophthalmia neonatorum usually occurs during the week after birth. Chlamydial ophthalmia neonatorum usually occurs 7-14 days after birth and may occur by up to 30 days after birth, making identification of cases particularly difficult and increasing the probability of confusing chlamydial ophthalmia with conjunctivitis due to other causes.

Other perinatally acquired STDs can also result in substantial neonatal morbidity, including chlamydia pneumonia and neonatal HSV infection. In countries with adequate diagnostic capacity, these cases may also be reported through the notifiable disease surveillance system.

(3) Data elements and reporting system

Data to be incorporated in the case-reporting system can be classified as core and additional data element. Core data elements that are essential to reporting a case should be routinely be collected on clinic logs and reporting forms. Additional data elements may be collected at some sites, which can provide more details on patient demographics, risk characteristics and treatment. The selection of additional data elements will depend on the specific purposes for which they will be used. While relevant data may be collected at the health facilities for the purpose of case management, data to be reported should be minimal, for example, diagnosis, age group and sex to avoid overburdening the health care providers.

Data elements

Core data elements:

- Diagnosis (syndromic or etiologic)
- Reporting site
- Date of visit
- Gender
- Age or age-group or date of birth

Additional data elements:

- Residence
- Education
- Syndrome (for etiologic reporting)
- Anatomic site of infection
- Date of symptom onset
- Risk behaviour
- Pregnancy
- History of STD
- Treatment

STD programmes should design data elements to be included in the reporting form as optimum questions and should fit in the real situation of STD services. Data to be used in STD surveillance have different objective from data for other STD service activities such as treatment or contact tracing. For example, patient identification has no role in surveillance while it is necessary for treatment or partner management. However, design of data collection should be able to minimize multiple counting of the same patient who may come to STD clinic several times.

One challenge in reporting STDs through the universal reporting system in many developing countries is that the age groups that are often used in aggregate reporting forms make it impossible to identify how much disease is occurring among adolescents and young adults. Age grouping at 5-year intervals is desirable, especially for the younger age groups (e.g. 10-14, 15-19, 20-24, 25-29, etc.).

It is suggested that STD case-reporting format should be integrated into routine surveillance activity as for other communicable diseases or other public health problems. Routine reports are sent by hospitals and health centres. However, in many countries where STD services are also provided in special clinics, STD case-reporting should be done from such clinics as well.

Data record form must be available in each place. This form can be either one individual sheet for each patient or line-listing form for several patients. The simplest would be a tally sheet as shown in Annex 1(a) and 1(b). Important point to note is that after interview and data collection from each patient, it should be recorded in the form immediately. Data from each place should be counted and filled in an aggregate-table. STD programme manager may ask each hospital, health-centre or STD clinic to report the aggregate-table to the local public health office. Local public health office should analyze the data collected from each locality and report to the STD programme manager in an aggregate or summary table. The report should be sent from the local public health office to the national STD programme office on quarterly basis. Examples of table for aggregate reporting are shown in Annex 2(a) and 2(b).

In countries where national reporting system is well established, the use of STD case-reporting should be promoted by incorporating the diseases into the national reporting system. This universal reporting system can be used to provide a minimum estimate of population-based STD incidence throughout the country. Sites that are not reporting, or those with sudden decline in reports, should be contacted to determine their obstacle in reporting. Attempts should be made to assist these sites to enable them to report STD cases.

3.2 STD Prevalence Assessment and Monitoring

A second major component of STD surveillance is prevalence assessment and monitoring in sentinel sites and populations. The primary objective of these activities is to measure the magnitude of and monitor the trends in STD prevalence among defined populations in selected sites. It can also result in identification of population subgroups with high prevalence of STDs.

Sentinel surveillance involves repeated periodic sampling in selected groups and in selected locations with the purpose of monitoring trends over time. The sentinel sites may be chosen randomly or by convenience sampling of facilities fitting predetermined criteria. The essence of this type of surveillance is that the sites are monitored over a period of time with the aim to obtain high quality and consistent data from a limited number of sites where active cooperation is ensured.

At the beginning, sentinel sites should be selected after consideration of the infrastructure of health care delivery, level of cooperation, resource availability, and the purposes of establishing the system. The sites selected should include facilities from all sectors that provide STD care. They can be STD clinics, hospital based clinics, primary health care centres and/or private clinics depending on the decision of the STD programme. Participating sites should come from all geographical regions of the country. They should represent both urban and rural areas. The sites should be selected on the basis of availability of resources and willingness of the staff at the sites to participate in STD surveillance. Sentinel sites should have sufficient number of samples to represent the target population in order to monitor magnitude and trends e.g. antenatal clinic attendees, sex workers, military recruits. In the beginning, the number of sites should not be too big to be unmanageable. With experience, the number can be gradually increased.

In many situations, prevalence of some of the STDs is already being monitored through routine screening. For example, women are routinely screened for syphilis during antenatal care or at delivery. In this setting, primary purpose of testing is to detect and treat syphilis although the prevalence can also be determined from these data.

Factors that should be considered while conducting sentinel surveillance for STDs:

(1) Laboratory requirements

Sentinel surveillance can be carried out for STD syndromes but the quality is improved by laboratory support. In most circumstances, it requires serological testing for syphilis, and testing for endocervical chlamydial and gonococcal infection.

Diagnostic tests are more useful for assessing prevalence when the test results are specific for active infection. For example, while cervical gonococcal and chlamydial testing is specific for active infection, non-treponemal syphilis serological testing is not, unless titres are examined on different occasions and in relation to a reliable treatment history (in most developing country settings, such data are not available). Treponemal tests alone (which usually remain reactive for life) are of no use in distinguishing adequately treated syphilis from active syphilis infection. Use of a non-treponemal test titre cut-off (e.g., 1:4 or 1:8) may assist in monitoring trends in prevalence of active syphilis infection.

Prevalence study can be performed in the presence of local laboratory infrastructure or in collaboration with another laboratory. Standard of test procedure for each of STDs under prevalence assessment should be set up. Quality control is an important issue, and quality of specimen collection and testing should never be taken for granted. Often, the quality of specimen collection and testing improves with experience, and it is important not to confuse improved testing with increasing prevalence of disease. Where feasible, specimen adequacy should be monitored periodically. An independent measure of the quality of laboratory tests should be established through a system of proficiency testing by a reference laboratory.

(2) Selection of populations, sample size, sampling and frequency

In all countries, it is essential to assess prevalence among persons who because of their risk behaviour are likely to have high rates of disease (for example, female sex workers). The feasibility of including such populations will depend in large part on the extent to which they are identifiable and accessible. A period of formative behavioural assessment may be needed to learn how to best access these persons, not only for reasons of monitoring disease burden, but also for providing STD care and HIV prevention services.

Populations which are considered to be potential for STD prevalence assessment are as follows:

(a) High risk behaviour group: commercial sex workers (CSWs)

This group can be considered to be at high risk of STDs. In many countries, this group is not easily accessible. Where accessible assessment of STD prevalence could be done in the STD clinic when they come for routine check up. Total or sequential sampling can be used to select the subjects. The minimum assessment of STD prevalence among this group should include syphilis, gonorrhoea, chlamydia, and genital ulcers (by examination). It is possible to integrate STD prevalence assessment together with HIV sero-surveillance and HIV risk-behavioural survey. In order to monitor STD prevalence, it is not necessary to conduct survey or assessment of STD frequently; once a year may provide enough information. However, in countries where CSWs visit STD clinic for routine check up regularly, it is recommended to collect information continuously. Sites for participation in STD prevalence assessment depend on the feasibility, and capacity to access and identify such population.

(b) General population such as women at family planning clinics and pregnant women at antenatal care clinic

In some countries, check up for some STDs is routinely carried out at antenatal clinics or family planning clinics. If so, the STD programme can collect information from selected sites. Continuous information on the numerator (number tested positive) and denominator (number tested) on a monthly basis are preferable in order for STD programme manager to calculate the rate of STD prevalence at each clinic. In some situations, where too many sites are doing routine check up for STDs, it may be more appropriate if data are collected from selected sentinel sites. For countries where routine check up does not include any STD or include only some STDs such as syphilis, STD programme manager should initiate collaboration with the reproductive health and/or mother and child health programmes to integrate STD check up into their routine service. STD routine check up should be simple and affordable for every client at these clinics.

(c) Other general population groups such asfactory workers, military recruits, and other groups

STD sentinel surveillance among other population groups without symptoms or suffering from other illnesses is extremely difficult. It must be ensured that enrolled subjects are voluntarily willing to participate and no negative consequences will happen to them if the test was found to be positive for STD. Thus, data collection process as well as specimen collection should be done in an ethically sound manner with confidentiality ensured at all times. Informed consent must also be obtained.

For all groups listed above, sample size should be calculated before STD prevalence survey or assessment is done. Statistically, minimum acceptable sample size for assessing prevalence depends primarily on the expected prevalence of the disease in the population, and on whether or not it is intended to monitor trends in prevalence over time. These requirements are described in Annex 3. However, practically, sample size can be adapted to fit in the real situation. For example, if routine check up is already in place for CSWs visiting STD clinic, it is proposed to collect already available data on every CSWs who come for such purpose.

(3) Assessing prevalence of symptomatic versus asymptomatic STDs

Prevalence assessment has a bigger role among asymptomatic STDs than in the symptomatic infection since those with symptomatic disease usually visit the clinical care settings; thus prevalence will be heavily biased because these patients are presenting for care.

For STDs that are often asymptomatic (e.g., chlamydia and gonorrhea in women, syphilis) prevalence assessment may provide a crucial information of the disease burden in the population from which patients seeking services not related to STD are drawn, for example, clients at the family planning clinics and women at antenatal care clinics. For some targeted populations all may be examined, such as military recruits, and sex workers under routine examination. However, it is essential to take ethical consideration into account before any examination is done for STD prevalence assessment among these groups.

Tests that do not require gynaecological or genital examinations can facilitate screening (and prevalence assessment) outside of clinic settings. Urine tests for gonorrhoea and chlamydia based on nucleic acid amplification methods can be used for this purpose, although their cost may limit their use and they are not widely available. The leukocyte esterase test can be used for screening men for presence of urethritis, but the sensitivity and specificity of this test varies considerably depending on the population screened and the individuals performing the test.

STDs that are most useful for prevalence assessment and monitoring*

All settings	Settings where patients are seen without Relation to symptoms#
Syphilis (m,f)	Syphilis (m,f)
Gonorrhoea (f)	Gonorrhoea (m,f)
Chlamydia (f)	Chlamydia (m.f)
Trichomoniasis (f)	Trichomoniasis (m,f)
	Genital ulcer disease (m,f)
	Urethral discharge (m)

* This table focuses on the major curable STDs that can be diagnosed by standard diagnostic tests or physical examination. Serological tests for viral infections (e.g., HSV-2 and hepatitis viruses) can also be used as measures of prevalence in all settings. Serological testing for chanchroid is available in some specialized laboratories.

#Examples include women at delivery, women at family planning clinics, factory workers, military recruits, etc.

(4) Data elements and reporting formats

Data elements required for sentinel surveillance are similar to those for aggregate case-reports. However, denominator of the total number of patients seen or of laboratory tests, segregated by the same characteristics during the same period, is also required. Based on these data elements the local health authority as well as national STD programme manager can calculate the rate of STD prevalence by each classification strata of each demographic factor and other variables. Trends of prevalence rates of each STD can also be performed. Local health authority is required to submit the results of STD prevalence assessment in a tabular format for which each variable is classified into stratum, for example, prevalence rate of a specific STD by population subgroup which may be further classified by age groups. At the national level, the STD programme will then compile the results from each sentinel site and analyze to obtain a country estimate.

Tests for STD diagnosis are performed on a confidential manner, unlike unlinked anonymous testing in HIV sero-prevalence survey. The results of the tests for STD are used for treating and counselling the patients, as well as for prevalence monitoring. However, testing for STD can compliment the studies on HIV prevalence. For example, sera that are tested for syphilis can also be tested for HIV, but without linking the result back to the individual.

Potential advantages of sentinel surveillance are that the number of sites is limited, reporting biases are minimized, and feedback information to the sites is simplified. Sentinel surveillance usually provides the opportunity to obtain higher quality data in more detail than universal reporting. This can be ascertained by training of staff in sentinel sites and close supervision by STD programme manager. An important limitation of sentinel reporting of STD cases is that it cannot provide population-based rates of disease.

The sentinel surveillance data are very beneficial to the STD programme for the purpose of planning and evaluation. It can identify population subgroups at high risk for HIV infection. Prevalence data could potentially guide funding and resource allocation for STD and HIV prevention and control programmes; monitor effectiveness of the STD/HIV prevention programme; and, finally, assist in estimating the number of STD cases in the country.

3.3 Specific STD Surveillance Activities

Specific STD surveillance may be used to supplement other surveillance activities. Targeted surveys may be the best way to obtain prevalence data in specific subgroups such as commercial sex workers or truck drivers. They are also useful for rapid assessment in areas where there are currently no surveillance activities. Specific studies may also be used for assessing the distribution of pathogens causing typical syndromes, case management practice of health care providers, and validation of existing surveillance activities.

Some areas of activities falling in this specific STD surveillance category are:

(1) Laboratory assessment of antimicrobial resistance

Laboratory notification has its role in the rapid identification of microbiological changes and the periodic monitoring of antimicrobial susceptibility pattern. It is important for each country to monitor antimicrobial resistance in *Neisseia gonorrhoeae*. In countries where rates of chancroid are high, special studies to periodically assess antimicrobial resistance in *Haemophilus ducreyi* may also be performed. The principal objective of this activity is to obtain data necessary for identifying effective drugs for treatment of such diseases.

Laboratory requirements for this activity include culture of the organism, performing biochemical and serological confirmatory tests, and performing test for the minimum inhibitory concentration (MIC) of antimicrobial agents. If no laboratory with such facilities is available in the country, it may send isolates to a WHO regional reference laboratory in New Delhi or Bangkok which are parts of WHO regional networks for antimicrobial susceptibility testing for *N. gonorrhoeae*. Alternatively, susceptibility testing may be performed using other methods such as E-test, Kirby-Bauer disc diffusion, however, these methods are not considered to be as reliable as MIC. In all countries that are able to culture *N. gonorrhoeae*, testing for plasmid-mediated resistance to penicillin is feasible. More details on this subject can be obtained from "Laboratory Diagnosis of Gonorrhoea", a publication of the World Health Organization, Regional Office for South-East Asia, Series no. 33.

Gonococcal isolates should be collected from sentinel sites in major cities, usually from urban clinics where culture for isolates is available. Isolates

may be obtained from culture of urethral discharge of men or vaginal discharge of women which show Gram negative intracellular diplococci. If isolates are routinely obtained by culture, these may be used. A sample of 100 isolates annually per sentinel site is usually sufficient to characterize patterns of resistance. A sample of 200 or more provides the opportunity for more detailed characterization, including an opportunity to examine more closely risk factors for resistance and the local epidemiology of gonococcal infection.

Data on gonococcal resistance should be reviewed quarterly and published at least annually. Data on resistance should be reviewed carefully and shared with national STD/AIDS programme for use in preparing updated treatment guidelines and in revising the country's list of essential drugs. The appearance of new resistant strains should be reported to a WHO collaborating reference laboratory as soon as possible. Intensive investigation of newly emerging resistance, in collaboration with WHO and other agencies, is warranted.

(2) Assessment of STD syndrome etiologies

Periodic assessment of etiologies of STD syndromes will be very useful for effective STD case management. The purposes are to:

- provide data for guiding STD case management using syndromic approach, and
- assist in the interpretation of syndromic case reports, and the assessment of disease burden due to specific pathogens

Assessing etiologies of STD syndromes requires the following laboratory facilities:

- For urethral discharge:
  - Microscopy (gram-stain of urethral exudate), culture, chlamydia testing
- For genital ulcer:
  - Syphilis serologic testing
  - Cancroid culture
  - Herpes simplex viral (HSV) culture or antigen detection test
  - Prototype multiplex PCR (tests simultaneously for T. pallidum, H. ducreyi, and HSV)

- For vaginal discharge:
  - Gram stain, wet mount, potassium hydroxide (KOH) preparation, diagnostic testing for chlamydia and gonorrhoea

Selection of populations for assessing etiologies of STD syndromes depend on number of cases available for examination at a single site. Ideally, these etiologies should be assessed in different types of populations with high and low rates of disease with a wide geographical distribution.

For practical reasons, particularly for countries with less developed infrastructure, it is useful to begin with assessment of etiology of urethral discharge and genital ulcer at a single specialized STD clinic. In countries where STD patients are managed syndromically, syndrome etiologies should be re-assessed once every two to three years, or more frequently if the need arises.

Sample size depends on the specific etiology and the expected prevalence of pathogens. For most purposes, a sample size of 50-100 specimens will provide adequate confidence limits for useful analysis.

Data on syndrome etiologies are important for interpreting data available from STD syndromic case reporting system. They are also useful for supporting treatment regimen for urethral discharge, and genital ulcer.

(3) Behavioural surveillance

Behavioural surveillance (BS) is a series of surveys of behaviours carried out in the same group over time. In the area of STD, the major goal of BS is to assess and monitor high-risk sexual behaviours in selected target groups on a regular and systematic basis. In these surveys, the selected samples will be interviewed using a set of questions focusing on the main behaviours that put them at risk of STD infection, such as pre-marital and extramarital sexual intercourse, frequent sexual contact with sex workers, non-use of condom when having casual sexual encounters.

Study populations can be any sexually active group, particularly adolescents, university students, industrial employees, workers of entertainment places, etc. Sample size required for each group can be determined based on the estimated level of key risk behaviour such as percentage of persons having sex with sex workers, and the degree of

confidence required to detect a significant change in behaviour over time. Cluster sampling is an appropriate way to select samples for the studies. The clusters for adolescents may be high schools, and for industrial employees may be factories and other industrial settings. Once the samples are selected, face-to-face interviews are conducted by gender-matched interviewers, at a private location. Data collected are analyzed, and the resulting products are presented or distributed of appropriate use. BS is being more frequently used as a tool in the field of HIV/AIDS prevention. Once conducted, it can be used to serve both HIV/AIDS and STD programmes.

(4) Research studies

STD programme manager may wish to conduct special studies to address critically the epidemiological situation of STD, which cannot be explained by case-reporting or prevalence assessments. Following studies have proven to be useful and STD programme may consider using them for programme purposes:

- Outbreak investigations of some selected STD syndromes or conditions
- Evaluation of STD syndromic management algorithms
- Rapid assessment of STD prevalence using new diagnostic tests
- Assessment of antimicrobial resistance in *H. ducreyi*
- Incidence and prevalence of STD-related complications:
  - Pelvic inflammatory disease
  - Ectopic pregnancy
  - Cervical cancer
- Prevalence of viral STD, e.g. HSV-2 and human papilloma virus (HPV)
- Prevalence of bacterial vaginosis and associated sequel in defined populations
- Assessment of STD incidence and prevalence among persons who are HIV-positive, and of HIV prevalence among persons with other STD
- Development and evaluation of STD screening criteria

- Assessment of health care-seeking behaviour and its relationship to under-detection and under-reporting of STD
- Public and private sector STD screening and reporting practices
- Country-specific estimates of incidence and prevalence of STD
- Estimation of economic costs of STD
- Survey to estimate number of CSWs
- Determination of sources of STD infections.

4. IMPLEMENTATION OF STD SURVEILLANCE

STD surveillance should be an integral part of an STD control programme. The routine case management process should be set up in such a way as to include data collected through STD surveillance.

For the surveillance to be useful and to meet the objectives, it must be actively conducted, be purposeful and result in public health action. The data must be of high quality and must be collected, collated and interpreted applying strict criteria, and complying with the principles of scientific validity, feasibility, continuity, standardization, consistency, and confidentiality.

(1) Private sector and laboratory-based case-reporting

It is important to encourage the private sector to report STD cases as most of the STD patients seek care from private practitioners. In countries where laboratories routinely perform STD diagnostic tests, laboratories should be encouraged to report the results.

Methods to encourage reporting include site visits, training courses, and provision of written materials providing updated information on STD diagnosis and treatment. Interactions with providers and laboratories should focus on providing them with useful information and feedback. Case-reporting should be presented as one aspect of appropriate STD care. Dissemination of STD surveillance data to individuals responsible for reporting can also be helpful in encouraging persons to report. Emphasis on the confidentiality of individual STD case report must be made. The reports should be simple with minimum data.

(2) Ensure data quality

STD surveillance programme should establish standards for quality of case-reports. Three critical components of data quality are completeness, validity and timeliness. These aspects of data quality do not address the sensitivity or representativeness of the surveillance system nor the self-reported demographic and behavioural data. These may be evaluated through special studies. Standardized format is useful to maintain data quality from different sites of reports.

Data quality can be improved by use of computerized systems that have built-in error checks and that can generate standard reports. However, quality of data can also be assessed through periodic examination of reporting forms, and by periodic site visits, during which local clinic logs are compared with reported data.

(3) Confidentiality of STD surveillance data

All STD surveillance programmes should have policies that protect the privacy of patients and the confidentiality of data. Data should be accessed only by authorized persons for the purpose of disease control. Unauthorized disclosure of personal identifying information on STD patients and other diseases can result in severe personal consequences for the patients. It also results in loss of confidence in the basic system of disease control, thereby jeopardizing disease control activities.

Personal identifying information should be maintained at the local site or local jurisdiction where access to the data should be restricted. Personal identifying information need not be (and is usually not) reported to the national level.

5. ANALYSIS, INTERPRETATION AND DISSEMINATION OF SURVEILLANCE DATA

At the local level, STD surveillance data should be analyzed at least every month. At the national level, quarterly analysis should be performed. Quarterly analysis may consist of the following:

- Comparison of the number of cases reported during this quarter with those of the same quarter in the previous year

- Examination of quarterly trends in the number of reported cases and prevalence for the past 2-3 years, overall, and by the following categories:
  - geographic area
  - gender
  - age group
  - provider type and
  - reporting site

In addition, annual analysis should be done and should include the following:

- Number of cases reported annually, stratified by the five categories listed above i.e. geographic area, gender, age group, etc.
- Annual trend in overall population-based rates of reported cases, using available census data or population estimates, and stratified by basic demographic categories

It is important for the STD programme manager both at the local and national level to keep in mind that the trend of STD cases may be influenced by the true incidence of STDs as well as by other potential factors. For example, one potential factor may be the increasing or decreasing accessibility of STD patients to health care services. Declining trend may be due to the effect of lack of manpower or lack of drugs. However, if the case-reporting system is stabilized and no major change has happened in the surveillance activities, it is likely that universal case-reporting will likely reflect trends in incidence. And if STD control programme is effective, a decline in cases will occur, representing a true decline in incidence.

(1) Disseminating, communicating, and using STD surveillance data

STD surveillance data should be disseminated to hospitals, health centres, STD clinics, and clinicians as well as laboratory workers who have reported the data. This process will encourage timely, valid, and complete reporting. National STD programme managers should use STD surveillance data for advocacy and to guide, target, and evaluate STD and HIV prevention activities.

After analysis and interpretation, STD surveillance data should be communicated to the National AIDS programme director, provincial or district health officers, health care providers, non-governmental organization, donors and other public health agencies.

When communicating surveillance data, STD programme manager should consider using the following types of reports:

- Annual report, with case numbers, prevalence rates, and trends by geographical area and demographic variables.
- Newsletter that provides clear, concise data with advice to clinicians, laboratory personnel, and others.
- Press releases to inform the public about the burden of disease and trends that can be used as a part of public information campaigns.
- Fact sheets with tables and graphs that can be posted at health department offices and clinics, and provided in response to ad hoc inquiries.

6. EVALUATION OF STD SURVEILLANCE SYSTEM

Evaluation of STD surveillance systems should be performed, internally once a year and externally once every two to three years. External evaluation should be carried out by those who do not belong to the STD/AIDS programme. Key points for evaluating STD surveillance system are:

- Identification of all STD surveillance activities, categorized by component (e.g. case-reporting, prevalence assessment and other specific surveillance activities) and by syndrome or disease;
- Separate evaluation of each component and of each syndrome or disease within each component, and
- An overall assessment to identify components that need to be strengthened, gaps, areas of duplication, and activities that can be dropped.

The evaluation process can be done within the framework of the WHO "Protocol for the Evaluation of Epidemiological Surveillance Systems". Following the evaluation, a plan for strengthening STD surveillance should be developed that identifies priorities within the context of the country's comprehensive STD/HIV prevention plan.

Annex 1A

TALLY SHEET FOR STD CASES BASED ON SYNDROMIC DIAGNOSIS

Name of health facility: Dates: From To

Syndromic diagnosis	Number of cases by sex and age group														Total
	Males							Females							
	0-4	5-14	15-19	20-29	30-39	40-49	50+	0-4	5-14	15-19	20-29	30-39	40-49	50+	
Urethral discharge	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO								
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO								
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO								
Genital ulcers	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Vaginal discharge								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Lower abdominal pain (women)								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Inguinal bubo	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Acute scrotal swelling	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO								
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO								
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO								
Neonatal conjunctivitis	OOOOO							OOOOO							
	OOOOO							OOOOO							
	OOOOO							OOOOO							
Other STD	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Total															

For every STD patient, cross one "O" vertically in the appropriate cell according to diagnosis, sex and age like this Ø.
Cross only at the first visit for the current episode. Do not cross for the follow-up visit for the current episode.
If the patient comes for another episode of STD, cross again. The total
At the end of each month, calculate the total horizontally and vertically.
One sheet is usually enough for one month. However, add more sheets if necessary.

Annex 1B

TALLY SHEET FOR STD CASES BASED ON ETIOLOGICAL DIAGNOSIS

Name of health facility: Dates: From To

Syndromic Diagnosis	Number of cases by sex and age group														Total
	Males							Females							
	0-4	5-14	15-19	20-29	30-39	40-49	50+	0-4	5-14	15-19	20-29	30-39	40-49	50+	
Syphilis	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Gonorrhoea	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Lymphogranuloma venereum	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Nongonococcal urethritis	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Chancroid	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Trichomoniasis	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Pelvic Inflammatory disease (women)								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Bacterial vaginosis (women)								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
								OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Candidiasis	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Genital herpes	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Granuloma inguinale	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Genital wart	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Neonatal conjunctivitis	OOOOO							OOOOO							
	OOOOO							OOOOO							
Other STD	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	OOOOO	
Total															

Annex 2A

STD REPORT BASED ON SYNDROMIC DIAGNOSIS

Country: Period of report:: Date of report::

Syndromic Diagnosis	Number of cases by sex and age group (years)														Total
	Males							Females							
	0-4	5-14	15-19	20-29	30-39	40-49	50+	0-4	5-14	15-19	20-29	30-39	40-49	50+	
Urethral discharge															
Vaginal discharge (women)															
Genital ulcer															
Lower abdominal pain (women)															
Scrotal swelling (men)															
Inguinal bubo															
Neonatal conjunctivitis															
Total															

1. This report of STD should be based on syndromic diagnosis.
2. Only new cases diagnosed during the period should be reported.
3. The report should include data from all treatment facilities, public and private.
4. The report should be forwarded quarterly and annually.

RESULTS OF SEROLOGICAL TEST FOR SYPHILIS

Persons tested	During this period		Cumulative for this year	
	No. tested	No. +ve	No. tested	No. +ve
Blood donors				
Pregnant women				
STD patients				
Others				
Total				

Remarks

1. The report should include data from all blood banks and laboratories, public and private.
2. The report should be forwarded quarterly and annually.

Annex 2B

STD REPORT BASED ON ETIOLOGICAL DIAGNOSIS

Country: Period of report: Date of report:

Etiological diagnosis	Number of cases by sex and age group (years)														Total
	Males							Females							
	0-4	5-14	15-19	20-29	30-39	40-49	50+	0-4	5-14	15-19	20-29	30-39	40-49	50+	
Syphilis															
Gonorrohoea															
Lymphogranuloma venereum															
Non-gonococcal urethritis															
Chancroid															
Trichomoniasis															
Pelvic inflammatory disease															
Bacterial vaginosis															
Candidiasis															
Genital herpes															
Granuloma inguinale															
Genital wart															
Neonatal conjunctivitis															
Other STD															
Total															

1. This report of STD should be based on etiological diagnosis.
2. Only new cases diagnosed during the period should be reported.
3. The report should include data from all treatment facilities, public and private.
4. The report should be forwarded quarterly and annually.

Results of serological test for syphilis

Persons tested	During this period		Cumulative for this year	
	No. tested	No. +ve	No. tested	No. +ve
Blood donors				
Pregnant women				
STD patients				
Others				
Total				

Remarks

Annex 3

STATISTICAL TABLES

Statistical table 1: 95% confidence intervals for observed prevalence by sample size, based on the binomial distribution

Sample size

Prevalence (%)	50	100	250	500	1000
0	0-7	0-4	0-2		0-0
2	0-11	0-7	1-5	1-4	1-3
10	3-22	5-18	7-14	8-13	8-12
20	10-34	13-29	15-26	16-24	18-23
30	18-44	21-40	24-36	26-34	27-33
40	27-55	30-50	34-46	36-44	37-43
50	36-64	40-60	44-56	46-54	47-53

Source: Fleiss JL. Statistical Methods for Rates and Proportions, 2nd edition. New York: John Wiley & Sons, 1981; and Snedecor GW, Cochran WG. Statistical Methods. Ames, Iowa: Iowa State University Press, 1967.

Statistical table 2: Sample size required for determining a significant ($p < 0.05$) decline between two proportions, with a power of 0.8, by baseline prevalence and proportional decline.

Proportional decline compared with baseline prevalence (%)

	Baseline Prevalence (%)								
	10	20	30	40	50	60	70	80	90
1	145,800	34,000	14,000	7,290	4,280	3,000	2,070	1,459	1,060
5	28,000	6,550	2,800	1,500	903	585	400	282	204
10	13,300	3,200	1,350	718	432	280	190	135	97
15	8,500	2,030	850	457	275	178	122	86	62
20	6,000	1,425	612	326	197	87	128	61	44
25	4,500	1,090	463	247	149	66	97	46	33

Note: Sample size requirements for determining significance of trends based on more than two observations may be larger or smaller, depending on the values of the intervening proportions. Source: Snedecor GW, Cochran WG. Statistical Methods. Ames, Iowa: Iowa State University Press, 1967.

SEA-STD-39-CGG