World Health Organization

A Tool for Strengthening STI Surveillance at the Country Level

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Acronyms

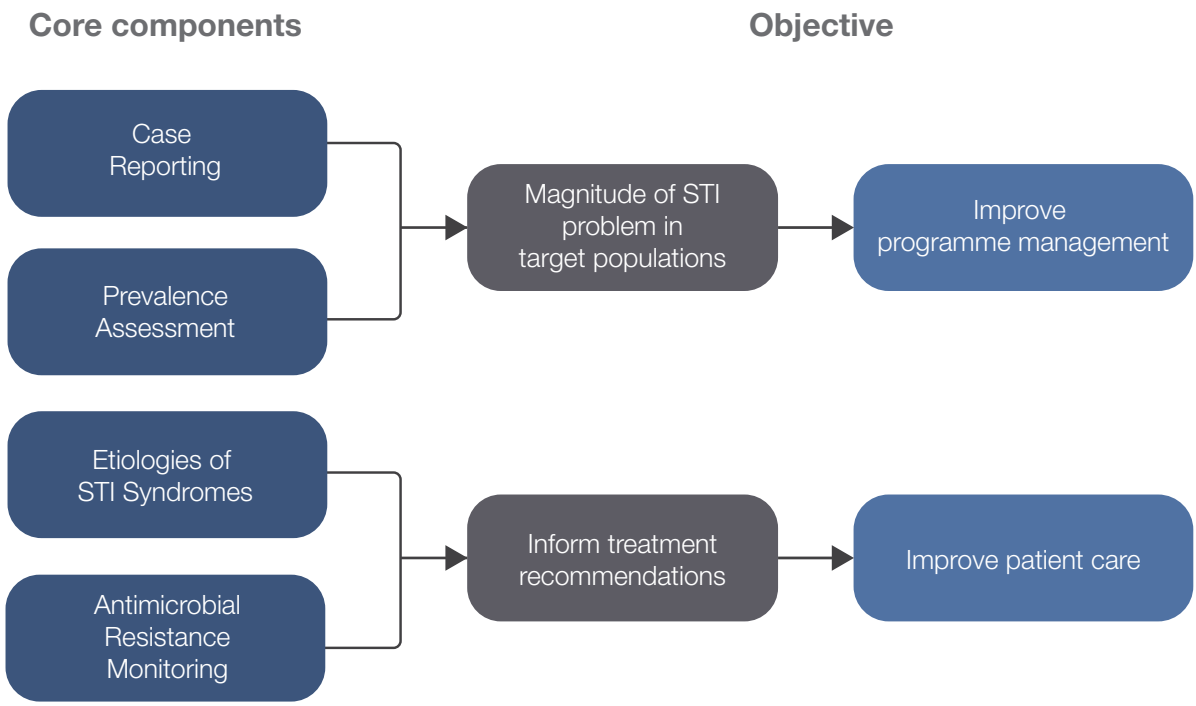
AMR	antimicrobial resistance
ANC	antenatal care
CS	congenital syphilis
DFA-TP	direct fluorescent antibody-*Treponema pallidum test*
GARPR	Global AIDS Response Progress Reporting
GASP	gonococcal antimicrobial surveillance programme
GHO	Global Health Observatory (of WHO)
GUD	genital ulcer disease
HSV	herpes simplex virus
LAP	lower abdominal pain
MoH	Ministry of Health
MSM	men who have sex with men
NAAT	nucleic acid amplification test
NGO	nongovernmental organization
PCR	polymerase chain reaction
RPR	rapid plasma reagin (test for syphilis)
RTI	reproductive tract infection
STI	sexually transmitted infection
SW	sex worker
TPPA	*Treponema pallidum particle agglutination assay*
UD	urethral discharge
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
US CDC	United States Centers for Disease Control and Prevention
VD	vaginal discharge
WHO	World Health Organization

Overview

Among the communicable diseases, sexually transmitted infections (STI) remain major causes of morbidity and mortality. Yet, many STI-related illnesses and complications are preventable with feasible and effective interventions and services. Continuous collection of timely and accurate data on STI incidence and prevalence are crucial for understanding the epidemiology of STIs, monitoring interventions and informing treatment guidelines. Moreover, these data also provide useful markers of the sexual transmission of HIV and can be used to assess the effectiveness of STI/HIV prevention programmes *(1).*

In 2012, the World Health Organization (WHO) released updated STI surveillance guidelines that outlined how to conduct STI surveillance and identified four core components: case reporting, prevalence monitoring, etiological assessment of STI syndromes, and gonococcal antimicrobial resistance (AMR) monitoring (Figure 1) *(2).*

Figure 1: Core components and objectives of STI surveillance



Source: Strategies and laboratory methods for strengthening surveillance of sexually transmitted infection 2012. Geneva: WHO; 2012.

However, many countries struggle to identify which STI surveillance activities to prioritize. As the cornerstone of STI surveillance, routine reporting uses readily available data on patients seen at health facilities to monitor incidence and prevalence trends of common STIs. The incidence of new infections is estimated from monthly case reports of symptomatic patients, while monitoring of prevalence relies primarily on data from routine screening programmes or sentinel surveillance. As a starting point for all countries, WHO recommends reporting of new cases of syphilis and gonorrhoea (and their related syndromes) and prevalence monitoring of syphilis among pregnant women, sex workers (SWs) and men who have sex with men (MSM). Minimal disaggregation by sex and age groups (15–24 and ≥25 years) is recommended to ensure feasibility while providing relevant information to improve programmes. Since 2014, countries have been asked to report globally through the Global AIDS Response Progress Reporting (GARPR) system on these key indicators *(3).*

It is important to help countries to determine how to prioritize and support these critical surveillance activities through the development of simple and standardized reporting forms and operational tools. This assessment tool is intended to assist countries in conducting an STI surveillance assessment to identify how to best optimize and strengthen existing systems, monitor trends and interpret data to improve STI control programmes. This assessment tool complements the recent WHO guidance on how to evaluate national HIV surveillance systems, which includes a brief mention of the key aspects of STI surveillance *(4)*. In the current assessment tool, the emphasis is on strengthening systems for routine STI case reporting and prevalence monitoring. Guidance on etiological assessments and gonococcal AMR monitoring is outlined in other WHO documents *(2).*

By strengthening routine STI reporting, countries can expect a number of benefits. These include reliable data on syphilis trends among different population groups, and on the incidence of gonorrhoea and common STI syndromes. Such data, which reflect trends in sexual transmission and the effectiveness of STI/HIV prevention efforts, can be triangulated with behavioural and HIV data as recommended for second generation HIV surveillance. Finally, reliable reporting of routinely collected STI data and prevalence monitoring provides a platform on which countries can add other important STI surveillance components, such as monitoring of STI etiologies and AMR patterns.

At the regional and global levels, more complete and reliable STI data from countries will enable more accurate estimations of STI burden and trends, and inform progress towards achieving the goals and objectives of the Global strategy for the prevention and control of sexually transmitted infections, the Global health sector strategy on HIV/AIDS and the Global strategy to eliminate congenital syphilis *(5,6,7).*

Who will use this assessment tool

This tool is designed for use by anyone involved in decision- or policy-making for national or subnational STI surveillance programmes, including consultants and those in programme management. This may be a part of national strengthening of STI and/or HIV control, as outlined in the programme guidance tool for strengthening control of reproductive tract and sexually transmitted infections *(8).*

How to use this assessment tool

This tool has two purposes. It helps countries

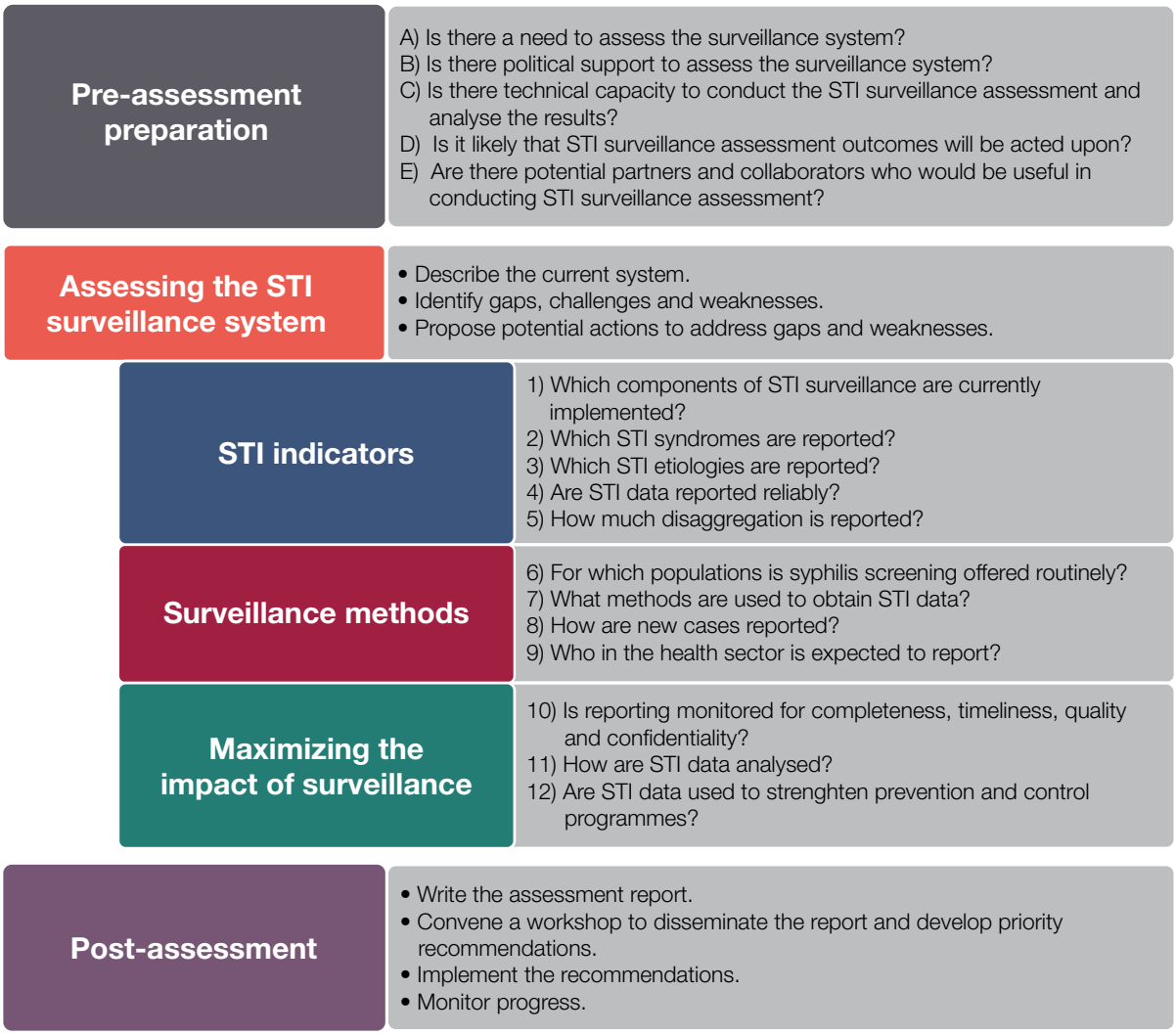
1) to assess their current STI surveillance activities, and

2) to facilitate planning for strengthening STI surveillance.

Figure 2 illustrates a possible sequence for assessing and strengthening STI surveillance: pre-assessment preparation; assessment, including review of STI indicators, surveillance methods, and how data are used; and post-assessment follow up. These steps can be adapted as needed to the specific country context.

The pre-assessment and assessment checklists (Annexes A and B) are intended to serve as tools to be used by an assessment team while conducting interviews and reviewing documents. In addition, Annexes C and D describe the critical context that may be helpful in asking each question in the checklists. The checklists and related guidance are generic tools, which should be adapted to the country context as needed. This assessment is intended to be just the first step of an ongoing process of strengthening STI surveillance. After the assessment, it is critical that the findings be used by key stakeholders to prioritize actions for improving STI surveillance (Annex E).

Figure 2: Steps for assessing an STI surveillance system



Annex A:
Pre-assessment preparation checklist

	Question	Yes/No/ Don't know	Comments	Potential actions
	Pre-assessment preparation			
A	Is there a need to assess the surveillance system?			
B	Is there political support to assess the surveillance system?			
C	Is there technical capacity to conduct the STI surveillance assessment and analyse the results?			
D	Is it likely that the outcomes of the STI surveillance assessment will be acted upon?			
E	Are there potential partners and collaborators who can help support an STI surveillance assessment?			

Annex B:
STI surveillance assessment checklist

	Question	Yes/No/ Don't know	Comments	Potential actions
1	Which components of STI surveillance are currently implemented? • Case reporting • Prevalence assessments • Etiology studies • Antimicrobial resistance monitoring			
2	Which STI syndromes are reported? • Genital ulcer disease • Urethral discharge • Vaginal discharge • Lower abdominal pain • Anorectal discharge • Other (specify)			
3	Which STI etiologies are reported? • Syphilis case reports (new cases) • Syphilis prevalence (from routine screening) • Gonorrhoea (new cases) • Congenital syphilis (new cases) • Other STIs (specify)			

	Question	Yes/No/ Don't know	Comments	Potential actions
4	Are STI data reported reliably? • Are case definitions used to identify STI etiologies and syndromes? • Is laboratory testing needed for case definition at reporting level? • Are probable cases reported? If so, are they aggregated with confirmed cases or reported separately?			
5	How much disaggregation is reported? • Are STIs disaggregated by sex? • Are STIs disaggregated by age group? (comment if disaggregation is by age groups of 15–24 and ≥25 years) • Are new cases of primary and secondary syphilis reported separately from latent syphilis or syphilis of unknown duration?			

	Question	Yes/No/ Don't know	Comments	Potential actions
6	For which populations is syphilis screening offered routinely? • Pregnant women • SWs (male, female and transgender) • MSM • Other			
7	What methods are used to obtain STI data? • STI data collected widely ("universal", from all or most health-care facilities) • STIs monitored at select "sentinel" sites • If sentinel, comment on criteria for selection (high STI burden, trained staff, laboratory capacity, etc.) and scope (more detailed indicators?) • If combined universal and sentinel reporting, comment on how they relate to each other • What STI special studies have been conducted recently?			
8	How are new cases reported? • Individual case notification using case report form • Clinic registers and tally sheets with monthly aggregate reporting • Paper versus online reporting (specify if individual or aggregate) • Other (describe)			
9	Who in the health sector is expected to report? • Public sector • Private sector (describe key private sector providers) • Other (specify)			

	Question	Yes/No/ Don't know	Comments	Potential actions
10	Is reporting monitored for • Completeness • Timeliness • Quality • Confidentiality?			
11	How are STI data analysed? • Prevalence data are analysed separately from case reports • Trends are monitored • Geographical variation is considered • Analysis includes triangulation with HIV and behavioural data, across different populations			
12	Are STI data used to strengthen prevention and control programmes? • Is feedback given to reporting sites? How? • Is there an annual STI report? • How else are data disseminated and used? • Other comments			
Other comments				

Annex C: Critical context for pre-assessment of STI surveillance

Question A

A	Is there a need to assess the surveillance system?

Before embarking on any kind of assessment, it must be agreed by the relevant authorities that there is a need to strengthen STI surveillance. It is important to determine if an STI surveillance assessment has been conducted in the past and, if so, when and by whom. Any reports from previous or similar assessments should be reviewed in advance. In situations where STI surveillance is widely felt to be credible, representative and useful, there may not be a need for extensive surveillance strengthening efforts. However, strengthening of STI surveillance is of value in most countries, as the quality of STI surveillance is rarely sufficient to respond to all critical national, regional and global STI data needs, and data needs do evolve over time.

Question B

B	Is there political support to assess the surveillance system?

Prior to conducting any assessment or strengthening the programme, high-level support is needed from the central, provincial and district levels as well as from the communities. If partnerships with communities are not established and community perceptions regarding the problem are not considered, then it is very likely that community-, national- and local-level decision-makers may ignore the recommendations of the exercise, regardless of the seriousness of the situation.

Question C

C	Is there technical capacity to conduct the STI surveillance assessment, analyse the results and implement the recommendations?

It is important to ensure at an early stage that the required technical capacity is available for the assessment and its recommended improvements. There is a need for planning, gathering technical expertise, conducting assessment research, and analysing and writing reports. Therefore, investigators need to look at all these facets and ensure that the right type of human resources are available and, if there are shortages in some areas, that such expertise has been or will be sought through local or international partners.

Question D

D	Is it likely that STI surveillance assessment outcomes will be acted upon?

Prior to initiation, it is important to ensure and obtain an understanding that, after the assessment has been completed and recommendations made, a set of actions will be taken to respond to the needs identified

during the process. The likelihood of a successful follow up is greatest if the assessment is conducted in response to a request by the national AIDS or STI programme manager or the Ministry of Health (MoH). Identifying a national leader or champion for strengthening surveillance is also important for ensuring post-assessment action.

Question E

E	**Are there potential partners and collaborators who can help support an STI surveillance assessment?**

Collaboration with other projects and persons with previous experience is always useful to avoid pitfalls. A detailed budget that clearly lists all costs should be prepared, including for personnel, equipment, transport, stationery, communication, computer use, etc. A clearly thought out and fully justified budget is more likely to be supported.

Annex D: Critical context for assessment of STI surveillance

Question 1

1	Which components of STI surveillance are currently implemented?
	• Case reporting • Prevalence assessments • Etiological studies • Antimicrobial resistance (AMR) monitoring

Details

This question asks which of the **four key components** of STI surveillance are currently implemented. Comments should indicate strengths as well as gaps and weaknesses of the current STI surveillance system.

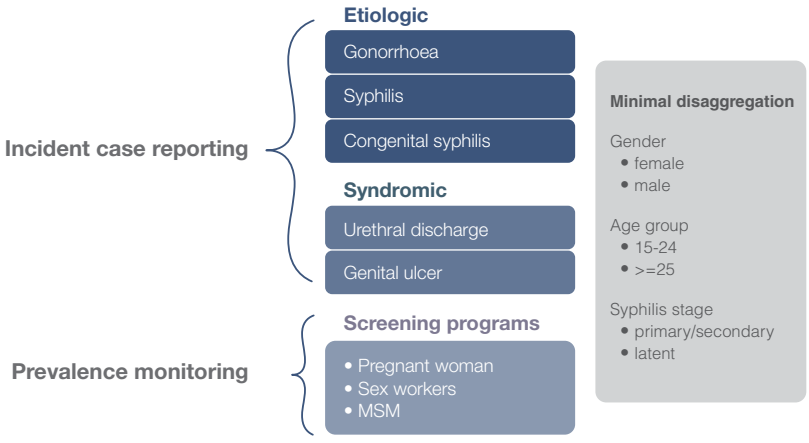
Plan

- Focus first on strengthening two components – case reporting and prevalence monitoring – as an initial platform for more comprehensive STI surveillance activities.
- Discuss and arrange, as appropriate, additional support for strengthening AMR surveillance and/or etiological studies *(2)*.

Notes: Components of STI surveillance

In 2013, WHO outlined a roadmap for strengthening STI surveillance at the global, regional and national levels *(9)*. In this document, the core indicators for routine collection were identified (Figure 3), and have now been incorporated as indicators reported by countries through the Joint United Nations Programme on HIV/AIDS (UNAIDS)/United Nations Children's Fund (UNICEF)/WHO GARPR system (Table 1) *(3)*. Strengthening the first two components of STI surveillance is critical for ensuring the highest quality of these indicators.

Figure 3: Schematic of core indicators for routine collection



Source: Adapted from Figure 17 in Baseline report on global sexually transmitted infection surveillance 2012. Geneva: World Health Organization; 2013:27.

Table 1: List of STI indicators incorporated into the 2014 UNAIDS/UNICEF/WHO GARPR system

Indicator	Numerator	Denominator	Source	Notes
ANC syphilis testing coverage	# ANC attendees tested for syphilis	# ANC attendees	National programme records (not special studies, unless representative)	Disaggregate: tested at any visit, tested at first visit
ANC syphilis positivity	# ANC attendees who tested positive for syphilis	# ANC attendees who were tested for syphilis	Special survey or national programme records	Disaggregate by age: total, 15–24, ≥25 years. Must note test type and definition of positivity (e.g. treponemal +, non-treponemal+, positive on both)
ANC syphilis treatment	# syphilis-seropositive ANC attendees who received at least 1 dose benzathine penicillin	# ANC attendees who tested positive for syphilis	National programme records (not special studies, unless representative)	
Congenital syphilis rate	# congenital syphilis cases (live and stillbirths) in past 12 months	# live births	Universal or sentinel case reporting	Note differences between national and global case definitions
Sex worker (SW) syphilis positivity	# SWs who tested positive for syphilis	# SWs who were tested for syphilis	Special survey or routine programme data	Disaggregation: total, male, female. Positivity = both treponemal and non-treponemal test positive
MSM syphilis positivity	# MSM who tested positive for syphilis	# MSM who were tested for syphilis	Special survey or routine programme data	Positivity = both treponemal and non-treponemal test positive
Syphilis in adults	# adults reported with syphilis	# adults aged 15 years and older	Universal or sentinel case reporting	Disaggregation: primary/ secondary, latent/ unknown duration. Assess representativeness, trends over time most useful.
Gonorrhoea in men	# men reported with gonorrhoea	# males aged 15 years and older	Universal or sentinel case reporting	Assess representativeness, trends over time most useful
Urethral discharge in men	# men reported with urethral discharge	# males aged 15 years and older	Universal or sentinel case reporting	Assess representativeness, trends over time most useful, periodic etiological assessments are important

Question 2

2	Which syndromes are reported?
	• Genital ulcer disease • Urethral discharge • Vaginal discharge • Lower abdominal pain • Other (specify)

Details

This question asks about the **STI syndromes** currently reported.

Plan

- Promote adoption of genital ulcer disease (GUD) and urethral discharge (UD) as the minimal set of WHO-recommended syndromic indicators (Table 1).
- Discuss inclusion of other syndromes (vaginal discharge [VD] and lower abdominal pain [LAP]), as desired for programme monitoring purposes (e.g. to follow service delivery volume, to assist with planning procurement of medications for STI/reproductive tract infection [RTI]).
- Syndromic reporting should be promoted even in countries that have laboratory capacity and do etiological reporting. The rationale for this is that often not all health facilities have laboratory capacity – basic syndromic reporting can thus be conducted at all facilities while etiological reporting can be done by sites with laboratory capacity.

Notes: Syndromic STI indicators, sample form

This form can be adapted for systems using syndromic reporting (adapted from *(2)*).

Aggregate STI report based on syndromic diagnosis (or presenting complaint)

Geographical unit:_____Date of report:_____ Time period covered by report:_____ to _____

Syndromic diagnosis	Number of cases by sex and age group (years)				Total
	Males		Females		
	15–24	25+	15–24	25+	
Urethral discharge					
Vaginal discharge*					
Genital ulcer					
Lower abdominal pain (women)*					

*Not collected globally, but may be useful for national purposes.

Aggregate STI report based on etiological diagnosis

Geographical unit:_____ Date of report:_____ Time period covered by report:_____ to _____

Etiological diagnosis	Number of cases by sex and age group (years)				Total
	Males		Females		
	15–24	25+	15–24	25+	
Syphilis (primary/secondary)					
Syphilis (latent/unknown duration)					
Gonorrhoea*					
Congenital syphilis					

*Gonorrhoea in women is not collected globally, but may be useful for national purposes.

Question 4

4	Are STI data reported reliably?
	• Are case definitions used for STI etiologies and syndromes? • Is laboratory capacity needed for case definition available at the reporting level? • Are probable cases reported? If so, are they aggregated with confirmed cases or reported separately?

Details

This question explores the reliability of STI indicators listed in questions 2 and 3 – whether **case definitions** are used, and whether there is adequate laboratory capacity to support etiological case definitions. Obtain copies of case definitions and comment on whether they are consistent with WHO case definitions or not. Probe further about laboratory capacity with attention to simple tests required by case definition e.g., (serological tests for syphilis, Gram stain for gonorrhoea) (Tables 2 and 3).

Plan

- Promote adoption of WHO case definitions.
- Plan for laboratory strengthening if indicated.

Notes: Case definitions

The following are the recommended case definitions for both syndromic and etiological STI indicators (Tables 2 and 3) *(2,6).*

Table 2: WHO case definitions for syndromic reporting

Case definition	Presumed cause	Notes on reporting
Genital ulcer disease An ulcer (a visible break in the skin) on the penis, scrotum or rectum in men, and on the labia, vagina, cervix or rectum in women	Genital ulcer disease **(GUD)** syndrome can be caused by syphilis, herpes, chancroid, lymphogranuloma venereum or granuloma inguinale.	All primary syphilis (etiological reports meeting case definition) should also be reported as GUD (unless the chancres are extragenital).
Urethral discharge A discharge in men (with or without dysuria), seen at the urethral meatus, with or without milking/expressing the urethra	Urethral discharge **(UD)** syndrome is commonly caused by *Neisseria gonorrhoeae or Chlamydia trachomatis;* other infectious agents associated with urethral discharge syndrome include *Mycoplasma genitalium, Ureaplasma urealyticum and Trichomonas vaginalis.*	Most cases of gonorrhoea in men (etiological reports meeting case definition) should also be reported as UD.
Vaginal discharge An abnormal vaginal discharge with change in the quantity, consistency, colour or odour (with or without vulval itching or burning)	Vaginal discharge **(VD)** syndrome is commonly caused by trichomoniasis, bacterial vaginosis and vulvovaginal candidiasis; it is less frequently caused by gonococcal or chlamydial cervical infection.	Gonorrhoea in women (etiological reports meeting case definition) should also be reported as VD if that is the presenting syndrome.
Lower abdominal pain in women Pain in the lower part of the abdomen	If accompanied by abnormal vaginal discharge, marked pelvic tenderness and cervical motion tenderness with or without fever, lower abdominal pain **(LAP)** is suggestive of pelvic inflammatory disease.	Gonorrhoea in women (etiological reports meeting case definition) should also be reported as LAP if that is the presenting syndrome.

Table 3: WHO case definitions for etiological reporting

Case definition	Additional criteria	Notes on reporting
Gonorrhoea Probable Microscopic demonstration of Gram-negative intracellular diplococci in a sample from the endocervix or urethra or rectum	Confirmed Isolation by culture of oxidase-positive, Gram-negative intracellular diplococci confirmed by an appropriate assay *(2,14)* or demonstration of *Neisseria gonorrhoeae*-specific DNA in a clinical specimen (from the endocervix, urethra, rectum or pharynx) by a properly evaluated nucleic acid detection test.	Gonorrhoea cases should also be reported as UD if the presenting syndrome is urethral discharge.
Syphilis, primary and secondary Probable An illness with ulcers (primary) or mucocutaneous lesions (secondary) and a reactive serological test (non-treponemal or treponemal). Primary syphilis lesions may occur on sites other than in the anogenital area.	Confirmed Demonstration of *Treponema pallidum* in clinical specimens by dark-field microscopy, direct fluorescent antibody-*Treponema pallidum* test (DFA-TP), nucleic acid test or equivalent methods	Primary syphilis cases should also be reported as GUD if the presenting syndrome is a genital ulcer.
Syphilis, latent No clinical signs or symptoms of syphilis and (1) a reactive non-treponemal and treponemal test in a patient with no prior diagnosis of syphilis; or (2) a non-treponemal test titre demonstrating fourfold or higher increase from the last non-treponemal test titre in a patient with a prior diagnosis of syphilis	Latent syphilis may be further characterized as early latent, if there is evidence that the infection was acquired within the previous 24 (or 12) months, and late latent, if there is evidence that the infection was acquired earlier. *Note: for reporting purposes, disaggregation of latent syphilis into early and late is unnecessary.*	Most latent syphilis is detected through screening and should be reported in the appropriate table for prevalence monitoring (antenatal care [ANC], SWs or MSM).

Simplified global surveillance case definition for congenital syphilis ***(11)***

Case definition
Congenital syphilis The global surveillance case definition for congenital syphilis is as follows: • a stillbirth, live birth or fetal loss at >20 weeks of gestation or weighing >500 g to a syphilis-seropositive mother without adequate syphilis treatment;[a] OR • a stillbirth, live birth or child aged <2 years with microbiological evidence of syphilis infection.[b]

[a] Adequate syphilis treatment is defined for reporting purposes as at least one dose of benzathine penicillin 2.4 mU IM (12).

[b] Microbiological evidence of congenital syphilis includes any one of the following:

- Demonstration by dark-field microscopy or fluorescent antibody detection of *T. pallidum* in the umbilical cord, placenta, nasal discharge or skin lesion material;
- Detection of *T. pallidum*-specific IgM;
- Infant with a positive non-treponemal serology titre ≥fourfold above that of the mother.

Question 5

5	How much disaggregation is reported?
	• Are STI reports disaggregated by sex? • Are STI reports disaggregated by age group? (comment if disaggregated by age groups of 15–24 and ≥25 years) • Are new cases of primary and secondary syphilis reported separately from latent syphilis or syphilis of unknown duration?

Details

This question asks whether STI reports are **disaggregated** and how. Comment on whether sex and age group disaggregation is compatible with WHO priority indicator reporting. Comment on whether sex disaggregation includes transgender persons or not. If the age groups are different from those given above, can they be aggregated into the age groups of 15–24 and ≥25 years? Comment on how syphilis cases are reported, in particular, if they are disaggregated by stage of disease. Countries that have the capacity to go beyond the minimal WHO priority disaggregation can also consider disaggregation by the presence or absence of symptoms, and/or disaggregation for different key populations (such as transgender persons, MSM or SWs).

Plan

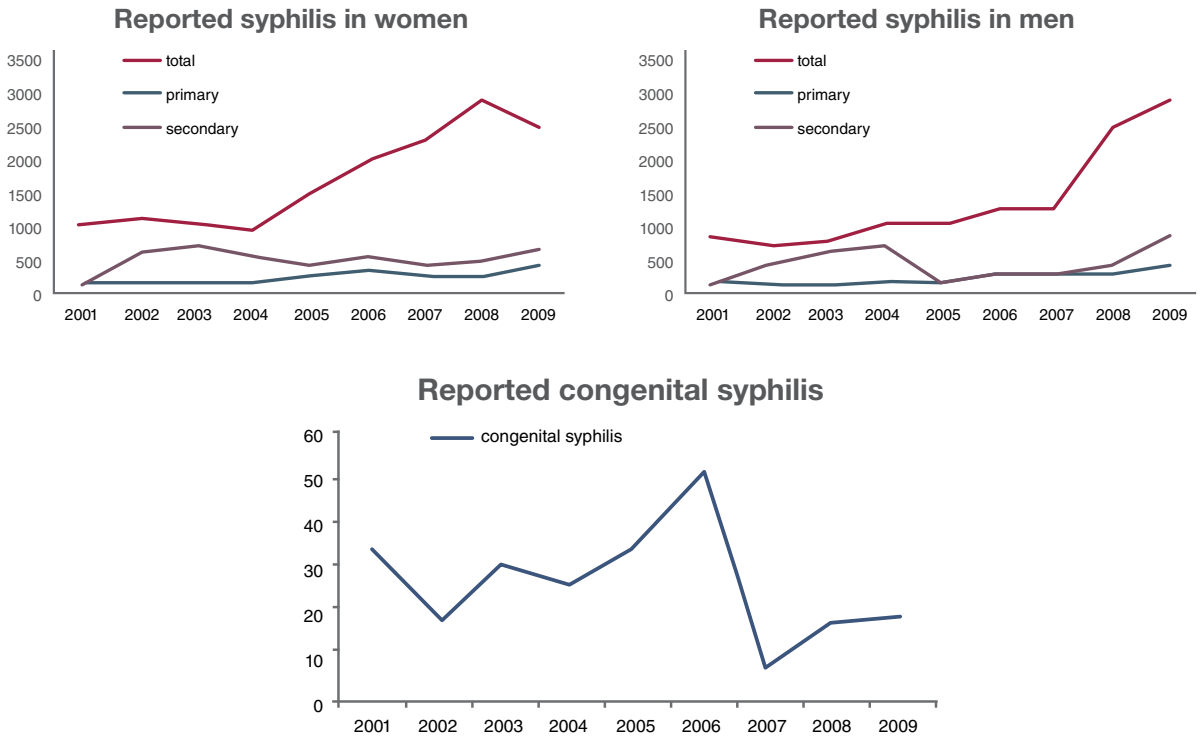
- Promote adoption of WHO priorities for disaggregation by sex and age group.
- Promote disaggregation of syphilis case reports as in question 5 (two categories: (1) primary/secondary, and (2) latent or unknown duration).

Notes: Disaggregation

The following data from Mongolia illustrate the importance of basic disaggregation of syphilis by sex and stage of disease (Figure 4).

1. The overall increase in detected syphilis cases among women is almost entirely due to detection of latent cases through antenatal syphilis screening, which was strengthened from 2005 (note also a change in case definition for secondary syphilis after 2004).
2. The increase in detected syphilis cases among men followed from 2008 when an effort was made to treat male partners of pregnant women with syphilis.
3. Monitoring of congenital syphilis cases provides evidence that improved detection of syphilis in pregnancy may be interrupting vertical transmission.

Figure 4: Trends in syphilis in Mongolia disaggregated by sex and stage of disease



Source: Ministry of Health, Mongolia, 2014 (unpublished data)

Question 6

6	**For which populations is syphilis screening offered routinely?**
	• Pregnant women • SWs (male, female and transgender) • MSM • Other

Details

This question focuses on **prevalence monitoring** among populations that are offered routine screening for syphilis – the one STI for which screening is universally feasible. First, ask about whether syphilis screening is routinely offered to these populations, and then determine whether data from the screening programmes are reported. Prevalence monitoring may also be possible from sentinel surveillance conducted periodically in these populations.

Plan

- Promote adoption of WHO recommendations on syphilis screening in each population group – pregnant women, SWs, MSM (see sample forms below).
- Promote reporting of routine screening data for each population.

Notes: Prevalence monitoring

These forms can be adapted for prevalence monitoring in services that offer routine screening for syphilis to specific populations, such as pregnant women, SWs or MSM.

Results of syphilis serology screening programmes

Geographical unit:_____ Date of report:_____ Time period covered by report:_____ to _____

Type of syphilis test used for screening (e.g. RPR, rapid treponemal test, TPPA, etc.):_____

_____

Persons tested	Number of persons attending facility	Number tested for syphilis	Number positive	Number treated	Remarks
Pregnant women (first ANC visit)					
SWs					
MSM					
Total					

RPR rapid plasma reagin test, TPPA *Treponema pallidum* particle agglutination assay

Question 7

7	What methods are used to obtain STI data?
	• STI data collected widely ("universal", from all or most health-care facilities) • STIs monitored at select "sentinel" sites • If sentinel, comment on criteria for selection (high STI burden, trained staff, laboratory capacity, etc.) and scope (more detailed indicators?) • If combined universal and sentinel reporting, comment on how they relate to each other • What STI special studies have been conducted recently?

Details

This question considers the **methods** of the surveillance system, whether universal and/or sentinel. **Universal surveillance** allows surveillance of an entire facility-based population and tracking of trends, and provides information useful for planning STI services. However, with universal surveillance it can be difficult to interpret trends because of underreporting, underdetection and fluctuations in health-care-seeking behaviours. **Sentinel surveillance** in a subset of facilities may make it more feasible to obtain higher-quality data, more manageable in terms of supervision, training and logistics, easier to conduct specific studies such as resistance monitoring, and may be initiated in a limited number of sites where training, and human and other resources are more readily available. The limitations of sentinel surveillance are that sentinel sites may not be representative of the populations of interest, and can make interpretation of data more challenging. Discussions should weigh the advantages of strengthening STI surveillance in sentinel sites versus universally, or planning for a **combined** system with both sentinel (more detailed) and universal (basic) reporting. In addition, most countries will conduct intermittent **special studies** that include STIs, such as integrated biobehavioural studies, population-based surveys, etc.

In selecting sites for a sentinel system, two important criteria are public health priorities and feasibility. In terms of public health priorities, some countries may prioritize sentinel sites representative of the general population, while others may recommend selection of sites where STI transmission is believed to be important, such as clinics that receive large numbers of STI cases in cities, ports, migrant destinations or border areas, or sites that provide services for subpopulations who are at high risk of contracting and spreading STIs. Such public health priority considerations should be balanced with feasibility considerations, such as the ability to collect high-quality data.

If using a combination of methods selected to be representative of the general population as well as covering high-risk populations, it is possible to calculate prevalence and incidence by weighting high-risk populations appropriately in the analysis.

Plan

- Engage key stakeholders in designing the structure of the system to ensure that the full plan reflects the anticipated data needs of current STI programmatic priorities.

- Determine what is feasible during an initial pilot or phased approach to systems strengthening. It may be preferable to pilot and assess new activities in a limited number of universal or sentinel sites, and then implement the full plan once the methods have been tested.

Notes: Levels of surveillance

STI surveillance data can be collected, analysed and reported through different methods, depending on the epidemiological importance and resources available.

For example, the following matrix shows how data collected through different methods can give a more complete picture of STI epidemiology than a single-level universal or sentinel system (Table 4).

Table 4: Matrix of different methods for collection of STI data

	Universal surveillance	Sentinel surveillance	Special studies
Genital ulcer disease (GUD)	Syndrome-based reporting of GUD	Etiological reporting based on syphilis serology	Etiological testing of GUD samples using multiplex polymerase chain reaction (PCR) (syphilis, chancroid, herpes simplex virus [HSV]-2)
Urethral discharge (UD)	Syndrome-based reporting of UD in men	Etiological reporting based on Gram stain, and/or culture of gonococci	Etiological testing of UD samples using nucleic acid amplification tests (NAATs) (gonorrhoea, chlamydia), antimicrobial resistance monitoring of samples from sentinel sites
Syphilis	Screening for syphilis of all women attending antenatal care (ANC)	Screening for syphilis of all sex workers (SWs) in selected sites Syphilis screening of all men who have sex with men (MSM) in selected sites	Inclusion of syphilis serology (treponemal and non-treponemal) in Demographic Health Surveys or other population-based surveys

Question 8

8	**How are new cases reported?**
	• Individual case notification using case report form • Clinic registers and tally sheets with aggregate monthly reporting • Paper versus online reporting (specify if individual or aggregate) • Other (describe)

Details

This question asks about the **type of reporting** currently practised (or planned). Many countries have legislation that requires **individual** case reports for a specific set of conditions, but compliance may be low. Individual case reporting can be paper-based or online. **Aggregate** reporting is ideal for facilities that provide care for many STI patients, or populations who are routinely screened for STI, as this can be an efficient way to compile data from all patients seen in that facility. Online reporting systems may have advantages in terms of timeliness and reduced burden of data entry, but can face similar problems of compliance as individual paper-based reporting.

Plan

- Assess the current reporting method and decide whether to strengthen or replace it.
- Strive for individual, online reporting where possible.
- Consider aggregate recording in sites with a high STI patient load.

Notes: Reporting methods

See sample of report form on page 13 and 14.

Question 9

9	Who in the health sector is expected to report?
	• Public sector • Private sector (describe key private sector providers) • Other (specify)

Details

This question asks whether reporting is expected from **public** sites only, or also **private**/nongovernmental organization (NGO) sites, and for what services (STI clinics, outpatient clinics, ANC, special services for SWs or MSM).

Plan

- Determine what is most feasible. It is often easier to begin with public sector services, then invite others to participate.
- Private providers (especially high-volume providers who see many STI patients) can be invited to participate using the same forms as in the public sector.
- NGOs, especially those that provide special services (to SWs, MSM), can be asked to provide data on syphilis prevalence in those populations.
- Determine which other services or departments (eg., Maternal and Child Health) need to be involved and how.

Notes: Private sector surveillance

In some countries, where many STI patients are believed to be seen by private health-care providers, attempts have been made to promote STI reporting from private sector facilities and providers. These include paper-based and online individual case reporting systems. Reporting biases may be different and more difficult to assess among private providers. If such a bias is thought to exist in private sector data, it is advised to disaggregate public and private sector data sources for reporting and analysis purposes. In countries where routine reporting by a large proportion of the private sector is not feasible, the use of sentinel surveillance for the private sector should be considered. This could include monitoring of large health insurance systems or the largest private sector providers. Further information on how to involve the private sector in STI surveillance can be found in the WHO publication Strategies and laboratory methods for strengthening surveillance of sexually transmitted infection, 2012 *(2)*.

Question 10

10	Is reporting monitored for
	• Completeness • Timeliness • Quality • Confidentiality?

Details

This question considers the **quality** of reporting. Indicate whether there are systems and data to assess completeness, timeliness, quality and confidentiality of reporting.

Plan

- Determine how monitoring the quality of reporting will be done and who will be responsible.
- Develop or adapt a reporting flowchart (Figure 5) to indicate the flow of data with expected deadlines.

- Develop criteria and methods for assessing completeness, timeliness and quality.
- Develop a written policy of confidentiality and other requisites to ensure privacy of the data.

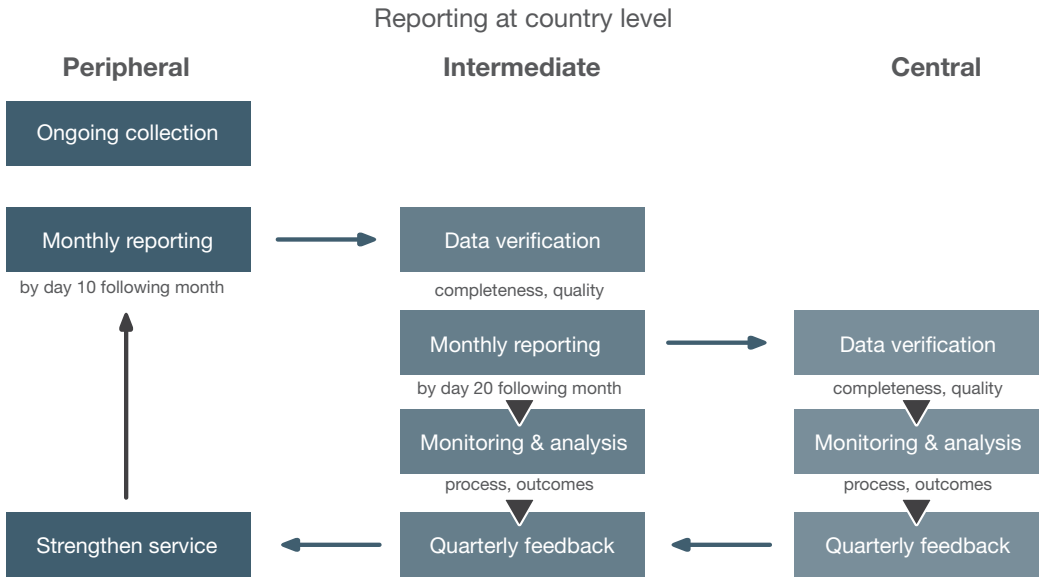
Notes: Completeness, timeliness, quality and confidentiality

Ensuring the completeness and timeliness of routinely reported STI data is of utmost importance.

A simple measure of data completeness is the proportion of "unknown" or blank responses to items on surveillance forms *(2)*. STI surveillance reports should note, when possible, the completeness of the data and recommend investigation in cases of systemic incompleteness.

Systems that passively wait for sites to report generally have poorer timeliness than active systems. Figure 5 is an example of a flowchart that includes reporting deadlines, and verification and feedback loops. This can be adapted as necessary to reflect the reporting system and country priorities.

Figure 5: Sample flowchart of STI surveillance reporting



Responsibilities for ensuring good operational performance at each step of the data collection and reporting process should be clearly identified and communicated to those who are involved at each level.

Data quality is a multifaceted property that includes completeness as well as sensitivity, positive predictive value, disaggregation, performance of the screening and diagnostic tests (i.e. the case definition), the clarity of surveillance forms, the quality of training and supervision of persons who complete these surveillance forms, and the care exercised in data management. Data quality is discussed in greater detail elsewhere *(2,4,14)*.

As data move from the local to the central offices, confidentiality should be maintained. All personal identifying information should be removed at the health-care facility before data are reported to the next level, staff handling the data should be educated on the importance of privacy and confidentiality, and the data should be stored in a secure place with limited access to authorized personnel only. Further information on confidentiality and methods to ensure it can be found elsewhere *(2,4,14)*.

Question 11

11	**How are STI data analysed?**
	• Prevalence data are analysed separately from case reports. • Trends are monitored. • Geographical variation is considered. • Analysis includes triangulation with HIV and behavioural data, across different populations.

Details

This question asks about data analysis. If the country has an **analysis** plan for its STI surveillance data, this should be reviewed. Are data disaggregated appropriately in the analysis? Are trends monitored? Are variations in disease by geographical area examined?

Plan

- Develop an analysis schedule – how often data will be analysed and in what detail (for example, basic analysis quarterly, more complete on an annual basis).
- Develop an analysis plan that includes the basic analyses that will be done during each period (Table 5).
- Promote separate analysis of incidence (case reports) and prevalence data.
- Promote triangulation of multiple sources of STI data, including syndromic, etiological, population-specific, behavioural, service delivery and HIV data (as in second generation HIV surveillance).

Notes: Analysis plan

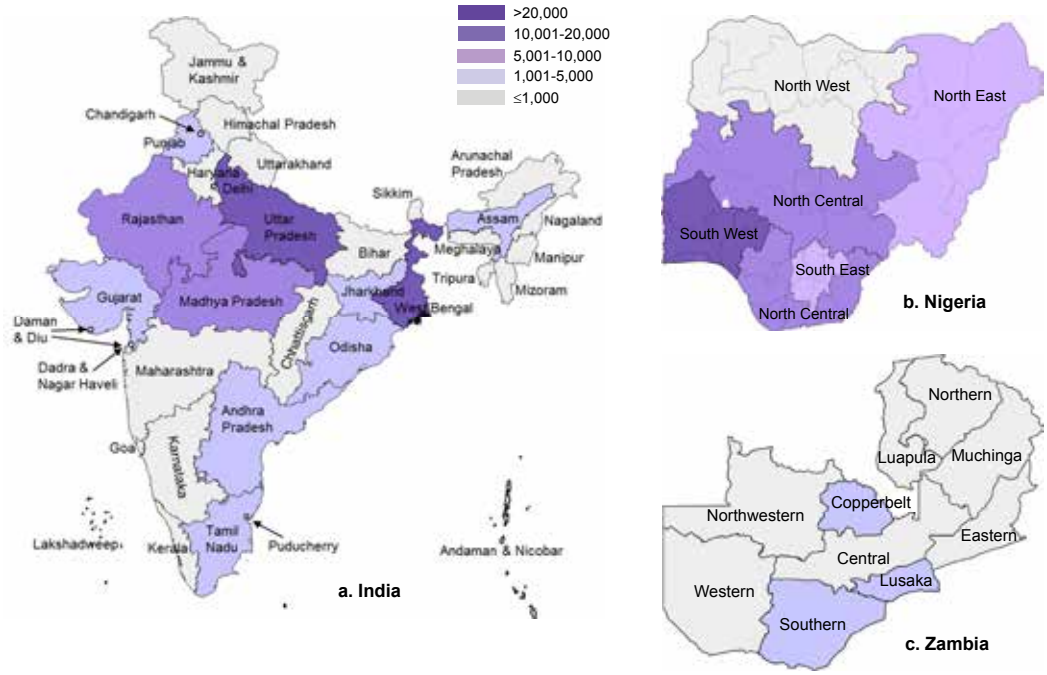
The following table should be adapted to address country needs (Table 5).

Table 5: Priority analyses of national STI surveillance data

Analyses	Details
• Monitor incidence (case reports)	• Gonorrhoea and syphilis • Common syndromes (GUD, UD, VD, LAP) • Congenital syphilis
• Monitor prevalence	• Syphilis in ANC, SWs, and MSM
• Disaggregate by demographics (minimal)	• Sex • Age groups: 15–24 and ≥25 years
• Disaggregate by populations	• Key populations (SWs, MSM, etc.) • Male bridging groups (STI patients) • General population (pregnant women)
• Analyse trends by time and place	• STIs are a sensitive marker of increasing (or decreasing) sexual transmission trends
• Triangulate with other data • Assess whether trends are consistent with transmission dynamics	• Condom use trends in key populations • HIV prevalence trends • Plausible patterns of trends among high-risk, bridging groups and general population
• Relate to programme inputs and other control efforts	• Identify areas where interventions need strengthening

Maps can be a useful way to show differences by region (Figure 6). However, interpretation of disease by geographical area, whether using maps, charts or tables, should be done with caution to avoid misinterpretation – regions with poor reporting may appear to have lower disease rates unless completeness of reporting is taken into account.

Figure 6: Disease burden of maternal syphilis cases by subnational area in India, Nigeria and Zambia in 2012



Source: Chen XS, et al. Estimating disease burden of maternal syphilis and associated adverse pregnancy outcomes in India, Nigeria and Zambia. IJGO (in press).(15)

Question 12

12	**Are STI data used to strengthen prevention and control programmes?**
	• Is feedback given to reporting sites? How? • Is there an annual STI report? • How else are data disseminated and used?

Details

This question is about **feedback and use of data** to improve programmes. All countries should plan to disseminate data, including providing regular feedback to reporting sites – both on STI trends as well as reporting performance (see example report format below).

Plan

- Decide on a feedback mechanism to reporting sites.
- Discuss how STI data will be disseminated.
- Coordinate the analysis schedule with programme planning cycles.
- Discuss how STI data will be used to improve programmes.

In addition, countries are able to view their data in a regional and global context. Several of the indicators reported through the GARPR system have been made publicly available through the WHO Global Health Observatory (GHO), which makes the data easily accessible online: http://apps.who.int/gho/data/node.main.

Notes: Feedback and use of data

An example of an outline for an annual STI report is given below:

Executive summary

1. **Introduction**
    - 1.1. Update on STI programme developments
    - 1.2. Emphasis on STI surveillance
2. **Reporting performance**
    - 2.1. Completeness (bar chart showing percentage of sites reporting per region)
    - 2.2. Timeliness (bar chart showing percentage of sites reporting on time per region)
3. **STI trends** (line charts for trends, bar charts for geographical comparison)
    - 3.1. Case reporting syndromic (universal: all possible sites)
        - 3.1.1. Urethral discharge (UD): men
        - 3.1.2. Genital ulcer disease (GUD): men and women
    - 3.2. Case reporting etiological (sentinel: all sites with laboratory capacity)
        - 3.2.1. Gonorrhoea: men
        - 3.2.2. Syphilis: men and women
            - 3.2.2.1. Primary and secondary (symptomatic cases)
            - 3.2.2.2. Latent or unknown duration (cases detected largely through screening programmes)
    - 3.3. Prevalence monitoring
        - 3.3.1. Syphilis prevalence among pregnant women (ANC)
        - 3.3.2. Syphilis prevalence among SWs (clinics serving SWs)
        - 3.3.3. Syphilis prevalence among MSM (clinics serving MSM)
    - 3.4. Other
        - 3.4.1. Any gonococcal antimicrobial surveillance programme (GASP) data
        - 3.4.2. Any relevant programmatic process data (coverage, attendance rates, etc.)
4. **Conclusion and recommendations**
    - 4.1. STI trends and programme priorities
    - 4.2. STI surveillance and recommendations for strengthening

Annex E: Post-assessment

Post-assessment follow up is critical to ensure that the findings and recommendations from the assessment result in a strengthened STI surveillance system. Such activities include the following:

- Write the assessment report.
- Convene a workshop to disseminate the report and develop priority recommendations.
- Implement the recommendations.
- Monitor progress in implementing the recommendations.

These steps are outlined in greater detail in other WHO publications *(8)*.

The results of the assessment and specific plans for next steps (both initial and subsequent, or short term and long term) should be clearly summarized in the assessment report (Table 6). These next steps constitute the beginning of an action plan for strengthening STI surveillance. In addition, it is important to identify who is responsible for each of these steps, what the timeline for accomplishing each step will be, and how progress of the work will be monitored. Through careful attention to post-assessment activities, the STI surveillance assessment can lead to a more robust, streamlined and effective STI surveillance system.

Table 6: Sample STI surveillance assessment report: findings and next steps

Proposed area of improvement	Initial steps (√=done)	Subsequent steps
Universal reporting of syndromes	• Agreed that this is useful but not currently feasible. Focus on implementing syndromic and etiological reporting at sentinel sites in first phase	Consider extending syndromic reporting to all health facilities in the subsequent phase based on sentinel site experience
Initial focus on strengthening sentinel sites	• Sentinel sites (departments) chosen based on criteria of likely STI burden and feasibility	Reporting sites within sentinel departments to be selected for (1) case reporting and (2) prevalence monitoring (ANC, SWs, MSM)
Selection of STIs with case definitions for sentinel site reporting	• Gonorrhoea in men • Syphilis (primary/secondary and latent/unknown) • Congenital syphilis	Review WHO updated case definitions Ministry of Health (MoH) to plan for dissemination of case definitions and training of sentinel site staff
Selection of STI syndromes with case definitions for universal reporting	• Urethral discharge in men • Genital ulcer disease in men and women	Review WHO updated case definitions MoH to plan for dissemination of case definitions and training of sentinel site staff
Define level of disaggregation by age, sex and stage (syphilis) for reporting	• Gender: female, male, transgender • Age groups: 15–24 and ≥25 years • Syphilis: primary/secondary and latent/unknown	MoH to plan for dissemination of case definitions and training of sentinel site staff
Online reporting	Assess feasibility of recording clinical and laboratory data separately or linking databases by patient (MoH)	Plan to validate online reporting in sentinel sites with data from clinic and laboratory registers (MoH)

Proposed area of improvement	Initial steps (√=done)	Subsequent steps
Reporting based on clinic registers	Assess whether clinical and laboratory data from clinic registers can be used for monthly or weekly reports (MoH)	Review existing registers and adapt as needed (MoH)
Improving completeness, timeliness, quality and use of data	Develop a plan for monitoring the surveillance system (MoH)	WHO to provide operational guidelines and support to improve performance of the surveillance system MoH to adapt and implement these

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