

Report on global sexually transmitted infection surveillance 2013



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Abbreviations and acronyms

AMR	antimicrobial resistance
ANC	antenatal care
CAREC	Caribbean Epidemiology Center
CDC	United States Centers for Disease Control and Prevention
CISID	Centralized Information System for Infectious Diseases
DTECS	Dual Testing for the Elimination of Congenital Syphilis
ECDC	European Centre for Disease Prevention and Control
EMTCT	elimination of mother-to-child transmission
ESC	extended-spectrum cephalosporin
FSW	female sex worker
GARPR	Global AIDS Response Progress Reporting
GASP	Gonococcal Antimicrobial Surveillance Programme
GUD	genital ulcer disease
HSV	herpes simplex virus
LGV	lymphogranuloma venereum
MSM	men who have sex with men
MTCT	mother-to-child transmission
PAHO	Pan American Health Organization
PID	pelvic inflammatory disease
PMTCT	prevention of mother-to-child transmission
PPT	periodic presumptive treatment
PWID	people who inject drugs
STI	sexually transmitted infection
UD	urethral discharge
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Executive summary

Sexually transmitted infections (STIs) are among the most widespread and harmful infectious diseases. An estimated half a billion new curable STIs occur worldwide each year. Syphilis, gonorrhoea and chlamydia remain major causes of disability and death despite being curable with antibiotics. Viral STIs, including herpes simplex virus (HSV), human papillomavirus (HPV), hepatitis B (HBV) and human immunodeficiency virus (HIV), are incurable and even more prevalent. Infection with multiple STIs is common and greatly facilitates sexual transmission of HIV. The largely preventable burden of disease attributable to sexual transmission, together with increasing resistance of *Neisseria gonorrhoeae* to available antibiotics, argue for a strong public health response.

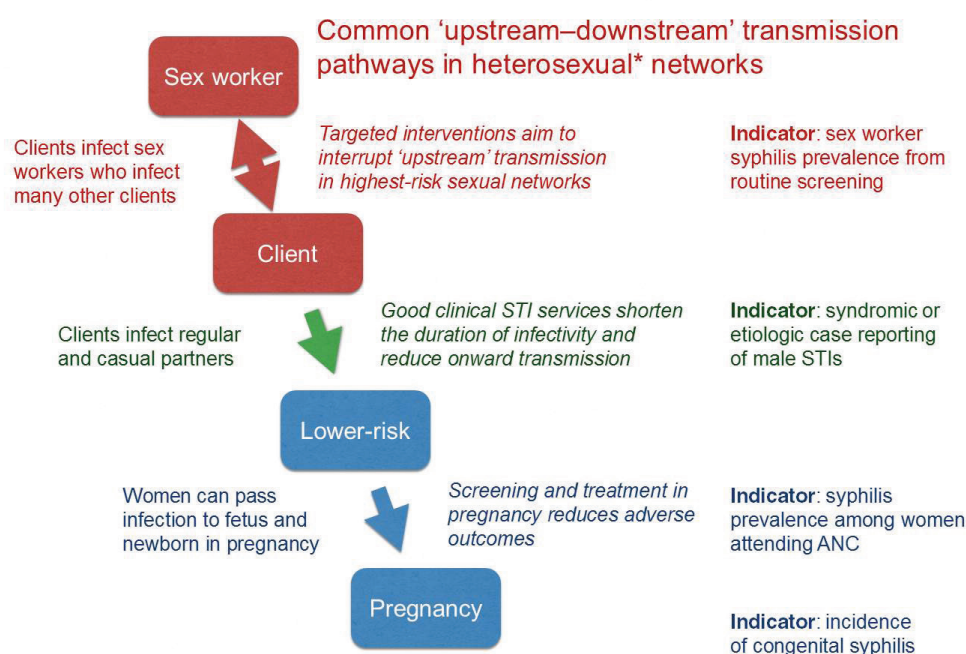
Fortunately, the prevention and control of all these infections involves similar interventions to interrupt sexual transmission. Where implemented well and at sufficient scale, such interventions have led to large declines in prevalence, elimination of several

STIs and reversal of HIV epidemics. The World Health Organization's (WHO's) *Global strategy for the prevention and control of sexually transmitted infections: 2006–2015: breaking the chain of transmission*¹ outlines the key strategies and promotes proven, affordable and highly cost-effective interventions to both (a) interrupt transmission where it spreads fastest and (b) provide services for all who may need them. Figure 1 illustrates how preventing infections in high-risk sex work networks slows transmission overall, and how different STI services are needed for different populations in different situations.

The success of such efforts depends on reliable data to guide an effective response. The Global AIDS Response Progress Reporting (GARPR) has recently added new STI indicators to inform HIV/STI prevention and control interventions at the local level and to monitor progress of national programmes. The need for more reliable data is an underlying theme highlighted in this report and is supported by new STI surveillance guidelines and a roadmap for strengthening routine reporting in

1 Available at: <http://www.who.int/reproductivehealth/publications/rtis/9789241563475/en>

Figure 1. STI transmission dynamics and related indicators



* similar transmission pathways operate in MSM networks with male sex work

countries. Better reporting is also promoted in the context of strengthening the Gonococcal Antimicrobial Surveillance Programme (GASP).

In this annual STI report for 2013, we pay special attention to syphilis, historically one of the highest priority STIs for control programmes due in part to its severe impact on pregnancy. Simple, affordable diagnostic tests and effective treatment make elimination of mother-to-child transmission of syphilis a real possibility. Progress has already been seen in several countries. Yet, in others, syphilis continues to spread rapidly, through higher-risk sexual networks to lower-risk populations and congenitally during pregnancy.

Recent progress can be seen in preventing both infectious and congenital syphilis. Each year, more women are being screened for syphilis in pregnancy and more countries are using routine service delivery data to report on key indicators of this intervention (Chapter 1). This allows for better monitoring and estimates – significant declines in maternal syphilis and adverse outcomes are already apparent between 2008 and 2012 – and criteria for certifying elimination of congenital syphilis are being piloted in several regions. At the same time, control of sexually transmitted syphilis is receiving renewed attention (Chapter 2).

Effective STI control efforts include good clinical services available to anyone who needs them, more intensive interventions to reach those at highest risk, and reliable data to guide the response. We review experience from several countries that report declining syphilis incidence (from routine case reporting) and consider the example of a comprehensive package of interventions for syphilis elimination in China. An important part of such STI control efforts – interrupting transmission in higher-risk sexual networks – is examined in the context of efforts to reduce syphilis prevalence among sex workers and men who have sex with men (Chapter 3).

Gonorrhoea and chlamydia control continue to present major challenges in most regions (Chapter 2). Lack of simple, accurate and affordable diagnostics limits screening options for asymptomatic infections in women. For gonorrhoea, resistance to antibiotics is an added concern. This report includes updates on the global situation from GASP (Chapter 5).

A key requisite for guiding STI prevention efforts is reliable data on disease burden and trends. Declining trends suggest that interventions are working while increasing rates are red flags signalling a weak response. Since STIs are transmitted by similar behaviour, reliable data on even a few STIs can provide programmes with the information they need to direct an effective prevention response in order to slow sexual transmission overall. Unfortunately, few countries currently collect, report, analyse and use STI data in a systematic manner to improve prevention and control programmes. In the WHO African Region, for example, an assessment summarized in this report identified a dearth of reliable STI data and few etiological or prevalence studies in the past 15 years, since existing STI programmes were largely subsumed into HIV programmes. Similar gaps have been highlighted in other regions.

Recognizing these challenges, WHO published updated guidelines on STI surveillance in 2012,² and developed a roadmap³ for countries to strengthen routine reporting as a platform for more comprehensive STI surveillance activities. In addition, new indicators for genital ulcer disease (GUD) and urethral discharge (UD) syndromes, syphilis and male gonorrhoea – with standardized definitions and data formats – were adopted for the GARPR. Declining STI incidence and prevalence rates can already be seen in some countries with long-term data, and strengthening of reporting systems will improve confidence in the validity of trends across regions.

More reliable and comparable data from countries should also help improve global estimates. WHO is currently working on 2012 estimates using similar methods as in the past, recognizing the limitations of published data sources. Following a global consultation on the issue, it was decided that methods would be broadened and improved in 2016 by taking into account other sources of data (i.e. routine case reports, behavioural and STI data from high-risk populations, etc.) and by employing modelling to analyse trends, describe likely

2 *Strategies and laboratory methods for strengthening surveillance of sexually transmitted infections 2012* (http://apps.who.int/iris/bitstream/10665/75729/1/9789241504478_eng.pdf)

3 The roadmap is contained in WHO's Baseline report on global sexually transmitted infection surveillance 2012 (<http://www.who.int/reproductivehealth/publications/rtis/9789241505895/en/>)

transmission dynamics and explore areas of uncertainty.

Improved STI surveillance and estimates give us a better idea of the extent of the problem, while also providing feedback to programmes on the effectiveness of interventions. Available data, as partially summarized in this report, demonstrate that STI control is both feasible and leads to measurable and cost-effective improvements in public health across a wide range of countries.

Introduction

Sexually transmitted infections (STIs) are among the most widespread infectious diseases, exacting substantial social and economic burden on families and communities worldwide. They remain important causes of morbidity and mortality due to common complications such as pelvic inflammatory disease, infertility, ectopic pregnancy, miscarriage, fetal deaths and congenital infections. Moreover, HIV epidemics develop more rapidly and spread more widely in places where other STIs are poorly controlled.

Strengthening STI control can thus deliver broad and important public health benefits, contributing to the Millennium Development Goals (MDGs) for child health, maternal health and HIV. A growing number of countries are demonstrating that control of common, curable STIs is indeed feasible, even in resource-limited settings. Countries such as Cuba, Sri Lanka and Thailand report sustained STI reductions to levels comparable to those seen in richer countries of Europe and North America. As highlighted in this report, a number of countries in each region report declining trends for syphilis in multiple populations, adding credibility to the vision of eliminating congenital syphilis as well as building momentum towards higher levels of syphilis control among adults. Disappearance of several previously common STIs like chancroid and lymphogranuloma venereum (LGV) in some countries suggests that wider elimination of certain STIs may be feasible. Moreover, such results have been achieved with affordable and highly cost-effective interventions, as recommended in WHO's *Global strategy for the prevention and control of sexually transmitted infections: 2006–2015: breaking the chain of transmission* (1).

The continued success of such efforts depends on reliable data to guide an effective response – from informing interventions at the local level to assessing the progress of national programmes. This is an underlying theme that runs through this entire report. Last year's report showed that most countries worldwide invest in STI surveillance despite lack of standardized methods and systems for regional and global reporting (2). This situation is improving with several initiatives, including WHO's updated STI surveillance guidelines, *Strategies and laboratory methods for strengthening surveillance of sexually transmitted infections 2012* (3), a roadmap for strengthening routine reporting (2), addition of new STI indicators to the Global AIDS

Response Progress Reporting (GARPR) and strengthening of the Gonococcal Antimicrobial Surveillance Programme (GASP).

The STI indicators collected through GARPR for 2012 included the following:⁴

1. Percentage of antenatal care (ANC) attendees who were tested for syphilis
2. Percentage of ANC attendees tested who were positive for syphilis
3. Percentage of ANC attendees positive for syphilis who received treatment
4. Number of reported congenital syphilis cases
5. Number of adults reported with syphilis
6. Number of adults reported with genital ulcer disease
7. Number of men reported with urethral discharge
8. Number of men reported with gonorrhoea
9. Percentage of female sex workers (FSWs) with active syphilis
10. Percentage of men who have sex with men (MSM) with active syphilis

Initial assessments of STI reporting in eight countries highlight a number of weaknesses that require attention in order to provide timely, complete and accurate epidemiological information that can be used to analyse trends, compare regional differences and triangulate with related data on HIV and sexual behaviours. We report on the early experiences of several countries in strengthening routine reporting systems and utilizing their data to improve programmes.

Pointing the way in this area is the recent experience of improving the detection and treatment of syphilis in pregnancy, under the initiative to eliminate mother-to-child transmission (EMTCT) of syphilis. With simple diagnostics and effective treatment available, indicators and targets were promoted to monitor antenatal clinic attendance, screen women early in pregnancy and treat those who test positive. Indicators are designed to be collected from all pregnant women at every service delivery point,

⁴ The indicators are numbered here in the order in which they appear in this report.

providing frequent and complete data without the need for special surveys (such methods mirror and are increasingly harmonized with reporting for prevention of mother-to-child transmission of HIV). This report includes updates on key indicators from global reporting, as well as recent estimates that indicate declining maternal syphilis and a reduction in adverse pregnancy outcomes.

Similar approaches are relevant in other areas of STI control and are currently being applied to strengthen the control of infectious syphilis. Routinely offering a syphilis screening test is recommended for populations at high risk for STIs, including sex workers and men who have sex with men (MSM) (4, 5). Systematic monitoring can provide regular data on the number of sex workers or MSM attending services, the proportion screened and treated for syphilis, as well as prevalence rates. These data can be used to improve interventions and to estimate sexual transmission trends over time. We present examples from several countries of such data that support declining transmission of infectious syphilis.

Lacking affordable, rapid, point-of-care diagnostic tests, routine reporting for STIs other than syphilis is more challenging. Yet, reliable reporting of syndromic data can provide critical information on more general sexual transmission trends, as shown in a recent example from Cambodia. Triangulated with behavioural and HIV data, such data can be used to assess and strengthen the performance of STI/HIV prevention programmes, as recommended in second-generation HIV surveillance (6).

Estimates of STI burden at the regional and global levels require additional data inputs – currently limited to reviews of published prevalence studies

– and new methods. Despite incomplete data and potential biases, however, we can estimate that common curable STIs account for roughly half a billion new infections each year, while common viral STIs account for several times more (7). This represents a huge and largely preventable burden of disease. Nevertheless, we present examples and data from several countries and regions indicating good progress with several STIs.

Resistance of bacteria, particularly *Neisseria gonorrhoeae*, to available antibiotics is progressing as reported in last year's report. The threat continues – we update the data and call for more countries to strengthen systems for monitoring this critical area of surveillance.

Other important and related areas of work further underline the need for better STI surveillance. As mentioned, STIs are important causes of a number of adverse sexual and reproductive health outcomes, yet estimates remain imprecise. Considerable progress has been made with estimating adverse pregnancy outcomes due to syphilis, and this has helped catalyse commitment to better syphilis control. Research has established the important causative role of gonorrhoea and chlamydia in pelvic inflammatory disease (PID), with common sequelae of infertility, ectopic pregnancy and sepsis. Better estimates of the burden of disease attributable to these important STIs and their complications depend on having better incidence and prevalence data on the causative STIs themselves. In addition, a recent technical consultation on vaccine development for both viral and bacterial STIs highlighted the need for more reliable data on which to model potential vaccine delivery and outcomes (8).

1. Progress controlling mother-to-child transmission of syphilis

Key points:

- Elimination of mother-to-child transmission of syphilis is a feasible, high-priority public health objective.
- Interventions focus on timely detection and treatment of syphilis among pregnant women.
- Key indicators of progress measure attendance for antenatal care (ANC), syphilis screening during ANC, syphilis positivity in pregnancy and treatment for cases of syphilis in pregnancy.
- Process measures indicate that progress is being seen in EMTCT of syphilis, and global estimates suggest a likely decrease in the burden of congenital syphilis.

One area of STI control that has seen measurable progress in recent years focuses on the prevention of maternal and congenital syphilis. In 2007, the World Health Organization (WHO) and partners launched a global initiative – elimination of mother-to-child transmission (EMTCT) of syphilis – to eliminate congenital syphilis as a public health problem. In the Americas, Asia–Pacific, Africa, and Europe, these programmes are combined with prevention of mother-to-child transmission (PMTCT) of HIV as dual elimination initiatives. According to the criteria established to guide programmes, validation of EMTCT of syphilis will be based on a country achieving:

- ANC coverage (pregnant women having at least one ANC visit) of $\geq 95\%$
- coverage of syphilis testing of ANC attendees of $\geq 95\%$ (see indicator 1)
- treatment of syphilis-seropositive ANC attendees of $\geq 95\%$ (see indicator 3)
- incidence of congenital syphilis of ≤ 50 cases per 100 000 live births (see indicator 4) (9).

Progress towards EMTCT of syphilis is reflected in the cascade of key indicators; the most recently reported data are displayed by country in Annex 1. The cascade of essential services – from ANC attendance, to screening for syphilis during pregnancy, to treatment of cases – are captured in the above priority indicators, along with outcomes

of syphilis positivity among pregnant women, such as incidence of congenital syphilis. The importance of a well-performing and complete cascade of services is emphasized in the selection of EMTCT targets – effective treatment depends on complete screening coverage, which in turn depends on high levels of ANC attendance.

1.1 Syphilis in pregnancy

Screening of pregnant women for syphilis is increasing in many countries, as is the treatment of women who test positive. Importantly, these improvements are often captured through routine reporting systems. With a continuous flow of service delivery data, programmes receive critical information from a large number of sites, permitting close monitoring and timely adjustments.

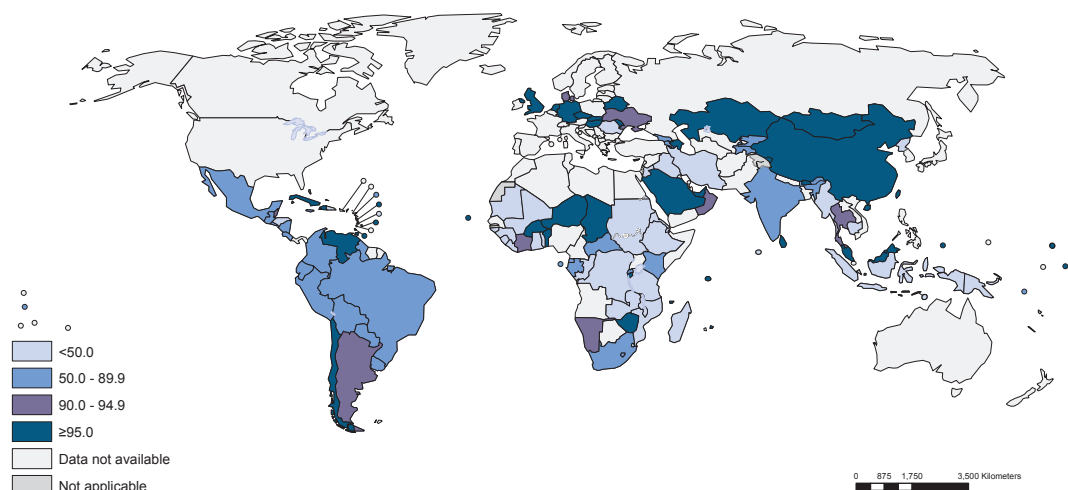
Programme indicators routinely reported from antenatal services are (1) summarized below for 2012 and (2) mapped by most recent year of reporting since 2005 (Annex 1, column 2).

Table 1.1 summarizes 2012 data on the three priority service indicators by WHO region for low- and middle-income countries, compared to 2008/2010 when reporting was first monitored at the global level. Increases in testing and declining rates of syphilis positivity suggest improvement, while reported treatment rates are generally high.

Indicator 1: Percentage of ANC attendees who were tested for syphilis

In 2012, 61 low- and middle-income countries reported on the proportion of women attending ANC who were tested for syphilis, up from 51 in 2008 (the first year monitored by United Nations reporting systems) (see Table 1.1). Figure 1.1 shows values for this indicator from each country's most recent year of reporting (see also Annex 1, column 4). Individual countries in each region are showing themselves to be models of high service delivery coverage.

Figure 1.1 Percentage of antenatal care attendees tested for syphilis (latest available data since 2008)

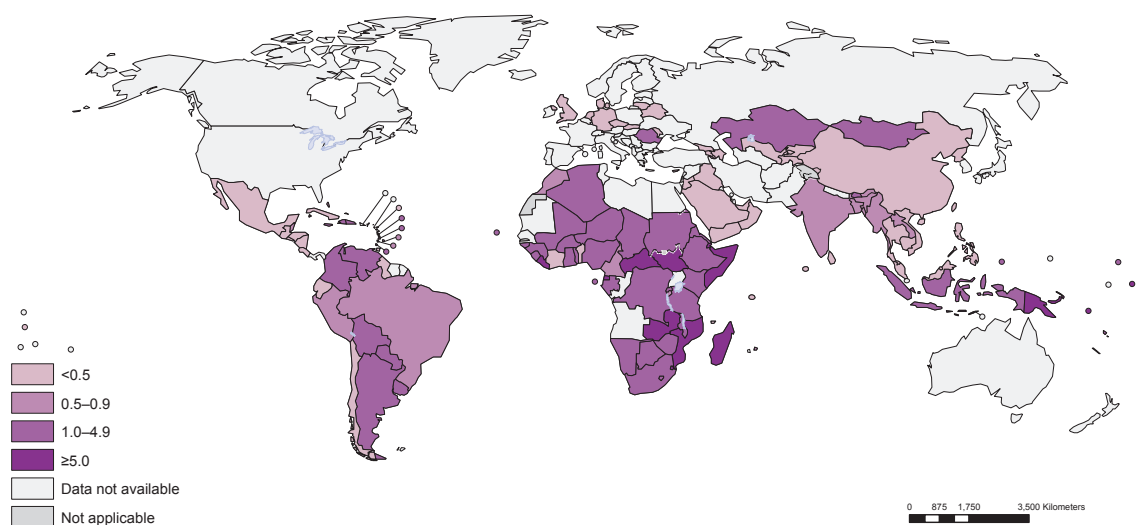


Source: WHO Global Health Observatory Data Repository (<http://gamapserver.who.int/mapLibrary/app/searchResults.aspx>).

Indicator 2: Percentage of ANC attendees tested who were positive for syphilis

Sixty-four countries provided data on the prevalence of syphilis among ANC attendees in 2012 (Table 1.1). The global mean positivity rate was 1.0% for 2012, with a prevalence above 5% in seven countries. Figure 1.2 shows values for this indicator from each country's most recent year of reporting (see also Annex 1, column 6). Even though countries may not report on these indicators every year, data are now available for 124 of 194 countries.

Figure 1.2 Percentage of antenatal care attendees positive for syphilis (latest available data since 2008)

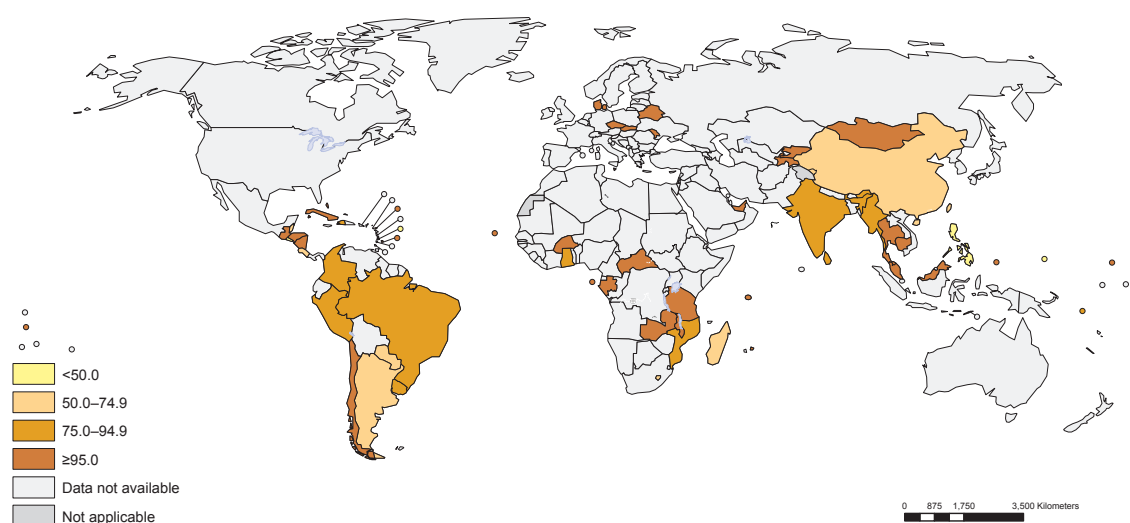


Source: WHO Global Health Observatory Data Repository (<http://gamapserver.who.int/mapLibrary/app/searchResults.aspx>).

Indicator 3: Percentage of ANC attendees positive for syphilis who received treatment

In 2012, 43 countries reported data on the proportion of syphilis seropositive women who received appropriate treatment, with a global mean of 94.2% reported for 2012. Figure 1.3 shows values for this indicator from each country's most recent year of reporting, with 21 countries reporting having attained the validation target of 95% treatment (see also Annex 1, column 8). Clearly most African countries are not yet able to collect this indicator. Data from countries clearly indicating that they were reporting on treatment policy, not actual treatment data, were not included in this report, nor were data that were clearly derived from a sentinel survey or special study conditions. However, it is felt by experts that many countries overreport treatment coverage and that these reported values are overly optimistic.

Figure 1.3 Percentage of ANC attendees positive for syphilis who are treated appropriately (latest available data since 2008)

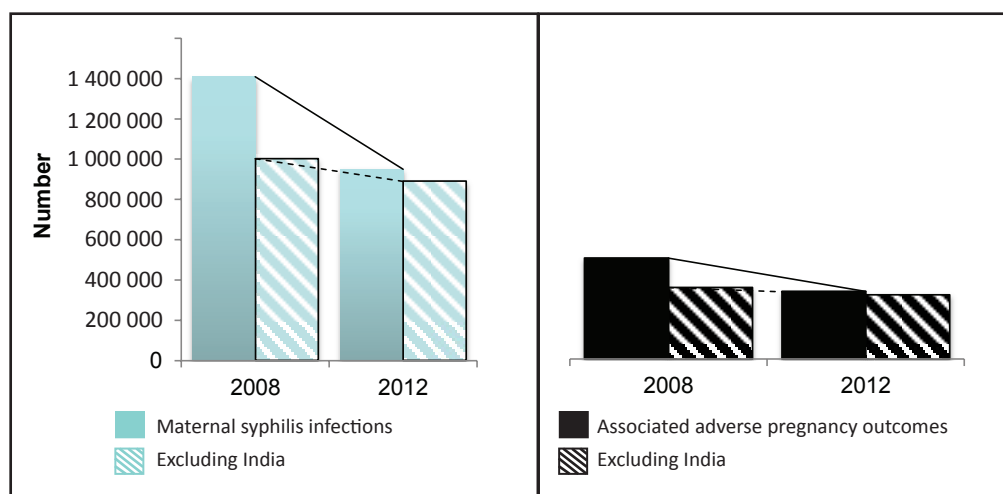


Source: WHO Global Health Observatory Data Repository (<http://gamapserver.who.int/mapLibrary/app/searchResults.aspx>).

Box 1: Using routinely reported data to monitor progress towards EMTCT of syphilis

Using modelling based on data reported through the Global AIDS Response Progress Reporting (GARPR) and previously published methods (10), WHO estimates that in 2012 there were approximately 950 000 maternal syphilis infections that resulted in 360 000 adverse outcomes, including 150 000 early fetal deaths or stillbirths, 50 000 preterm or low-birth-weight infants, 60 000 neonatal deaths, and 110 000 infants with congenital infection. An estimated 96% of maternal syphilis infection and 98% of adverse outcomes occurred in low- and middle-income countries. From 2008 to 2012, maternal syphilis infections and adverse pregnancy outcomes declined by 33%. Although India alone represented 37% of this decline due to improvements in data quality and STI control efforts, even when India was excluded from the analysis, the decline from 2008 to 2012 persisted at 11% for maternal syphilis infections and 10% for adverse pregnancy outcomes. Such data are a promising sign that efforts to control syphilis in pregnant women and other populations are having a true public health impact.

Figure 1.4 Estimated number of maternal syphilis infections and associated adverse pregnancy outcomes, 2008 and 2012

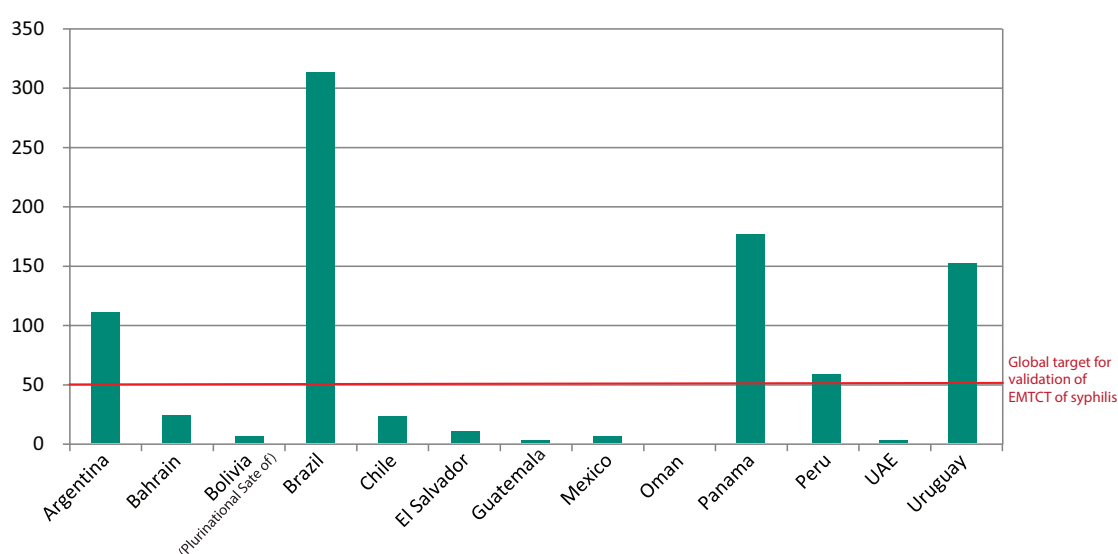


Source: Wijesooriya NS, Rochat RW, Kamb M, Turlapati P, Temmerman M, Broutet N, Newman LM, WHO, unpublished draft manuscript, 2014.

1.2 Congenital syphilis

Monitoring the incidence of congenital syphilis itself is more challenging than tracking indicators 1, 2 and 3 on syphilis in pregnancy. To assist countries with reporting, WHO has developed case definitions and tools. Congenital syphilis was piloted in two regions in 2012, and became part of routine GARPR starting in 2013 reporting. Prior to this, data on congenital syphilis case reporting were not routinely collected at the global level. Agreement has been reached on the criteria and processes for validation of (EMTCT) of HIV and syphilis, and guidance has been released (9).

Figure 1.5 Congenital syphilis rate (cases per 100 000 live births) in two pilot regions, 2012



Source: GARPR 2013, unpublished data.

Indicator 4: Number of reported congenital syphilis cases

Figure 1.5 shows 2012 pilot data from the Region of the Americas and the Eastern Mediterranean Region. Variability in reported rates between countries may reflect differences in case definitions and reporting as well as disease patterns. However, over time it is anticipated that trends within a country may be useful and that countries can be supported to strive for improvement of data quality.

Box 2: Elimination of congenital syphilis in the WHO European Region

Elimination of congenital syphilis in the WHO European Region is addressed as part of the initiative for dual EMTCT of both syphilis and HIV. Available data suggest low reported numbers of congenital syphilis, and high antenatal coverage, syphilis testing and treatment of those pregnant women who are found to be positive. In a recent survey of 53 countries conducted by the WHO Regional Office for Europe, it was found that the congenital syphilis prevention components in the majority of countries are incorporated into other relevant programmes such as maternal and child health programmes, PMTCT-HIV programmes, and broader STI control programmes (see Table 1.2). Integration across these different programme components helps to increase the overall opportunities for women (and men) to access screening and treatment interventions, and maximizes the overall levels of intervention coverage. The survey also found that many countries have policy/programme guidelines in place to ensure that the partners of syphilis seropositive pregnant women are also treated. However, even in the absence of a written policy/guidelines, the majority of the European countries surveyed had a variety of strategies in place to facilitate partner notification.

Ongoing data review and modelling efforts in the region may lead to a more stringent regional congenital syphilis elimination target than the global target, since low syphilis rates in the general population mean that a more ambitious target is attainable in most European countries. A regional consultation is being prepared to review progress made, to identify remaining challenges and to elaborate actions to accelerate efforts towards dual EMTCT of syphilis and HIV and validation in the region.

Table 1.2 Results of a survey on congenital syphilis policies and programmes in 53 European countries, 2012

Policy question	Number of positive country responses
<i>Integration of congenital syphilis strategy with other programmes</i>	
Integration of congenital syphilis strategy with broad STI strategy	21
Integration of congenital syphilis strategy with PMTCT-HIV guidelines	18
Integration of congenital syphilis strategy with maternal and child health or reproductive health strategy	23
<i>Partner notification policy and strategy</i>	
Patient advised to speak with partner	38
Patient given information to give to partner	23
Patient given prescription to give to partner	3
Provider-led notification	20
Outreach worker contacts partner	4

Source: WHO Regional Office for Europe, Survey of congenital syphilis policies and programmes in 53 countries, European countries, 2012.

Although reported congenital syphilis rates are available for some countries, in many countries congenital syphilis is not a reportable condition and thus no national data are available. In order to provide some information for such countries, WHO has worked to identify a simple method to model the adverse outcomes of syphilis in pregnancy using the data routinely collected through GARPR. This tool has not yet been validated for accuracy, but the modelled data may be helpful in understanding the current situation for countries without strong case report data; the data can be used to look at variation between countries and at the subnational level, and can be triangulated with other sources of data (see Box 3). Such data are useful for countries such as India, Nigeria and Zambia, which are striving to improve services and increase coverage for pregnant women to eliminate MTCT of syphilis.

Box 3: A tool to estimate the burden of maternal syphilis and adverse outcomes⁵

In 2013, the Bill & Melinda Gates Foundation initiated a project with WHO and PATH called Dual Testing for the Elimination of Congenital Syphilis (DTECS). The main goal of the DTECS project was to reduce adverse outcomes for pregnant women and newborns due to congenital syphilis and other maternal infections in three countries: India, Nigeria and Zambia. Prior to this project, none of these three countries had a complete set of quality data for monitoring and evaluating PMTCT or EMTCT of syphilis, partly because of weaknesses in their national surveillance systems and/or data collection systems of routine ANC services.

WHO and PATH have worked with the three countries to estimate the burden of disease, strengthen monitoring systems, analyse previous attempts to eliminate congenital syphilis, analyse country-level readiness, and develop an investment case for the syphilis component of dual EMTCT initiatives.

WHO has developed an online tool to estimate the burden of syphilis in pregnancy and associated adverse outcomes at the national and subnational levels. The tool uses routinely available EMTCT of syphilis programme data in an Excel spread sheet using similar methods used for WHO global and regional estimates (10).

This tool was used in all three countries to generate national and subnational estimates using existing data sources. The online tool and guidance document can be found on the WHO website.

The estimates obtained using the tool have been used by countries as follows:

- India has used the data as a basis to develop a national strategy for elimination of congenital syphilis.
- Nigeria has added syphilis back into its 2014 HIV ANC sentinel survey (after removing it in 2005), in order to identify priority areas for interventions aimed at EMTCT of syphilis.
- Zambia is poised to initiate a field evaluation of dual syphilis/HIV testing in ANC services.

These estimates demonstrated that MTCT of syphilis remains a problem and that there is great potential to save lives if efforts at elimination are increased. These data can be used to: leverage increased political and financial commitment at international and national levels for dual EMTCT of HIV and syphilis; improve availability, quality and uptake of EMTCT services for syphilis; and strengthen information collection, and programme monitoring and evaluation.

5 Available at: http://www.who.int/reproductivehealth/topics/rtis/syphilis/measurement_tool/en/

2. Slowing sexual transmission – infectious syphilis and other STIs

Key points:

- Reducing transmission of infectious syphilis is feasible and synergistic with EMTCT efforts.
- Proven interventions target symptomatic patients and populations at highest risk.
- Key indicators of progress include incident case reports monitored either etiologically (primary/secondary syphilis) and/or syndromically (genital ulcer disease).

Control of STI sequelae and complications – including adverse pregnancy outcomes – depends to a large degree on preventing sexual transmission and reducing STI prevalence among adults and adolescents. We turn our attention in this chapter to general STI control interventions and key indicators that can be used to assess progress.

2.1 Infectious syphilis

The rapid progress made in ramping up antenatal syphilis screening and reducing maternal syphilis and adverse pregnancy outcomes has generated renewed interest in control of infectious syphilis. The overall burden of syphilis can be reduced by slowing transmission among sexually active adults and adolescents. With less syphilis circulating in the population, fewer pregnant women become infected and carry syphilis into pregnancy. This reduces adverse outcomes for fetuses and neonates, as well as averting complications of syphilis among adults.

A number of interventions have been shown to reduce transmission of syphilis and other STIs among sexually active adults and adolescents. One is to improve the detection and management of STIs among people who come into contact with health services, usually because of symptoms. The other is to slow transmission in sexual networks with high incidence rates – including sex workers, MSM, and their clients and partners. The former is the topic of this chapter and the latter is discussed in the following chapter. Together such approaches not only slow syphilis transmission but are also effective against many other STIs. In addition, syphilis in its primary stage is an important cause of genital ulceration, a strong cofactor for HIV acquisition and transmission. Control of infectious syphilis and other ulcerative STIs thus directly contributes to HIV prevention.

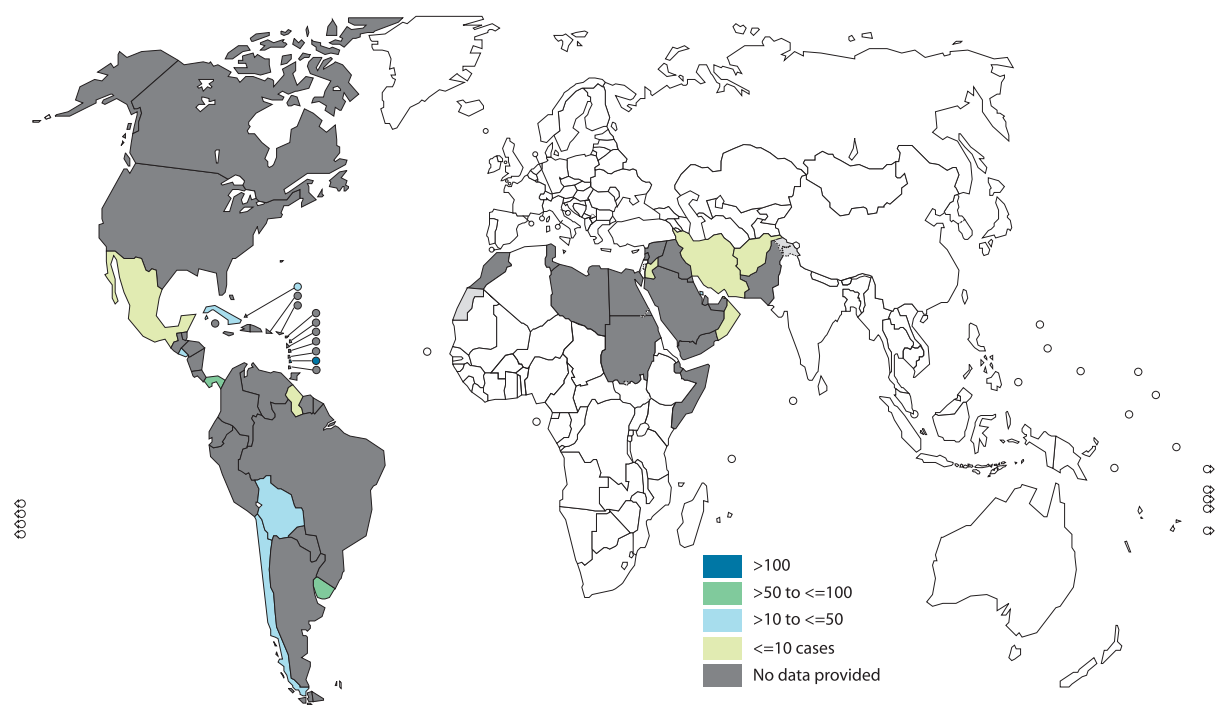
Case reports of primary and secondary syphilis are an important source of information about new cases (syphilis incidence). With good case management based on up-to-date treatment guidelines, early, symptomatic syphilis (primary and secondary) can be cured and sexual partners effectively treated, thus interrupting onward transmission. In addition, trends that show increasing incidence of primary and secondary syphilis can be considered a marker of the level of unprotected sexual activity, important for both second-generation HIV surveillance and STI surveillance.

Indicator 5: Number of adults reported with syphilis

Until now, syphilis data were not routinely collected at the global level. For 2012, reporting was piloted in two WHO regions and was incorporated in GARPR for all regions starting in 2013. Figure 2.1 shows 2012 pilot study data from the Region of the Americas and the Eastern Mediterranean Region. Data were reported for 11 countries in the former and 6 countries in the latter.

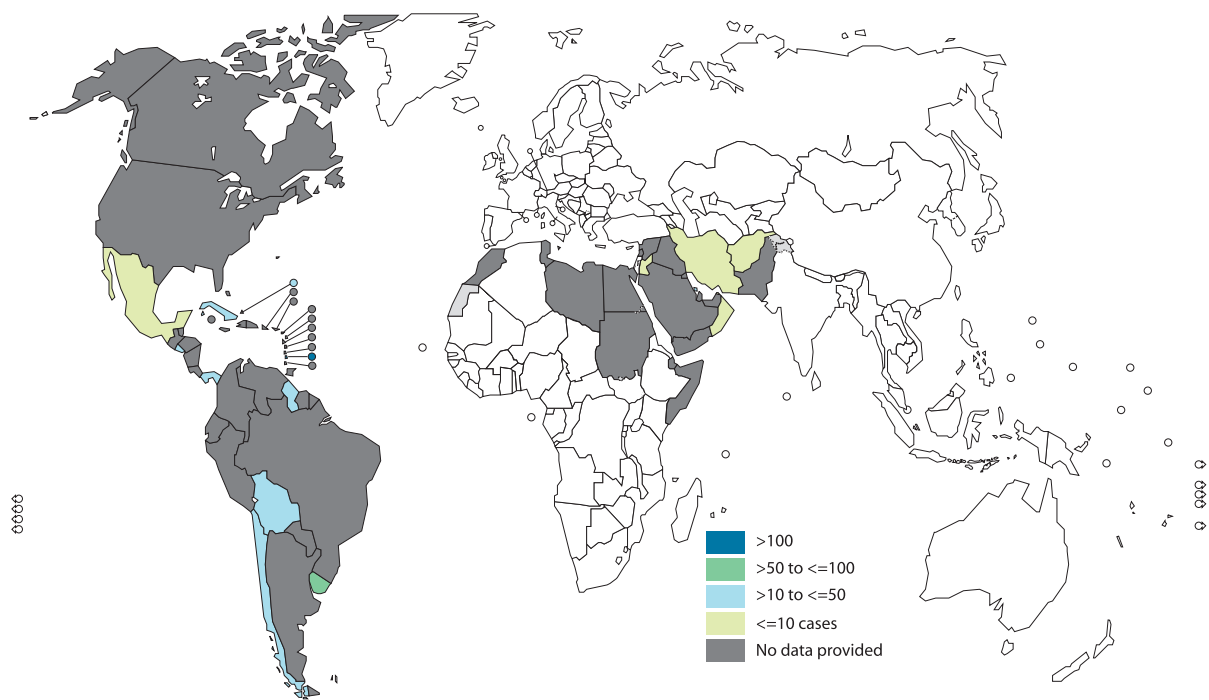
The 2013 pilot study data show high variability of reported syphilis rates. However, it is not possible to determine whether this variation is due to differences in epidemiology, screening programmes or reporting practices. Trends over time are not yet available to assist with interpretation of the data. Countries that report syphilis data do so using a range of case definitions – often combining primary and secondary syphilis with latent syphilis – making comparison difficult. For surveillance purposes, symptomatic cases (primary and secondary syphilis) are the most reliable indicators of recent transmission. Asymptomatic syphilis, identified through screening, provides useful prevalence data for populations being screened (e.g. pregnant women, sex workers, MSM). WHO recommends both indicators, with separate analysis of (1) incident case reports and (2) prevalence data, as illustrated in the following examples from Asia (see Box 4).

Figure 2.1a Syphilis rates (cases per 100 000 males) in two pilot regions, 2012



Source: GARPR 2013, unpublished data.

Figure 2.1b Syphilis rates (cases per 100 000 females) in two pilot regions, 2012

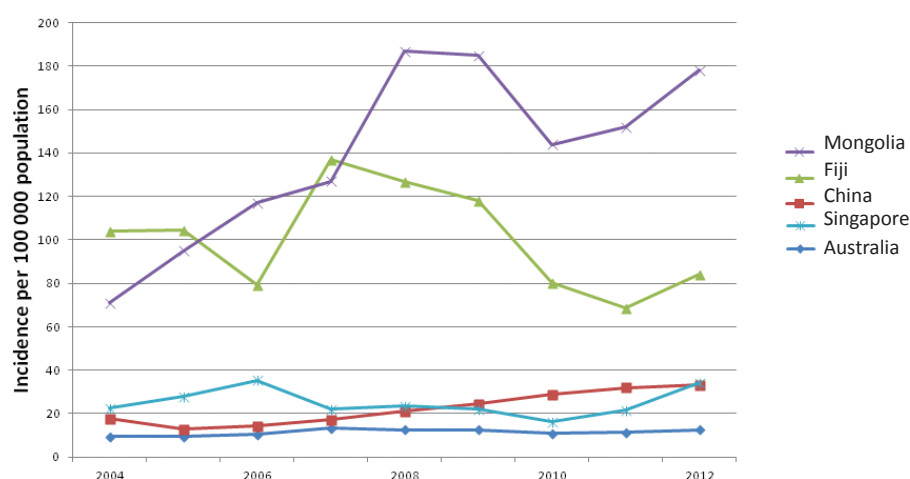


Box 4: Syphilis trends in the WHO Western Pacific Region

According to 2008 global STI estimates, over a quarter of all new curable STIs (syphilis, gonorrhoea, chlamydia and trichomoniasis) occur in the Western Pacific Region (11). Yet, several countries in the region have demonstrated remarkable success in controlling STIs, and improved STI surveillance is becoming a timely source of data to guide those efforts.

Figure 2.2 shows trends of syphilis case reports from several countries in the region which have been consistently reporting since 2004. At first glance, trends appear to be rising.

Figure 2.2 Syphilis incidence in selected countries in the WHO Western Pacific Region, 2004–2012



Compiled using data from Mongolia: Sexually transmitted infection and human immunodeficiency virus surveillance report 2011–2012; Fiji, Ministry of Health: Annual Report 2012; China: Sexually transmitted infection surveillance report 2012; Singapore: Communicable diseases surveillance in Singapore: Annual Report(2004–2012); Australia: National Notifiable Diseases Surveillance System 2012.

However, a substantial proportion of this increase is due to increased detection and reporting of syphilis among pregnant women (and their partners) as a consequence of improved screening in antenatal clinics. When data are disaggregated to separate cases detected through screening, syphilis case rates are low and stable across the region with a few exceptions.

Syphilis prevalence data from specific populations reinforce these findings. The few countries with higher incidence of syphilis in their routine case-reporting system (e.g. Mongolia and Fiji) than other countries also reported higher syphilis prevalence among ANC attendees than other countries. In these same countries, the reported prevalence of syphilis among sex workers was more than 20%. By triangulating data from different populations in this way, programmes gain confidence that surveillance data accurately reflect STI transmission patterns.

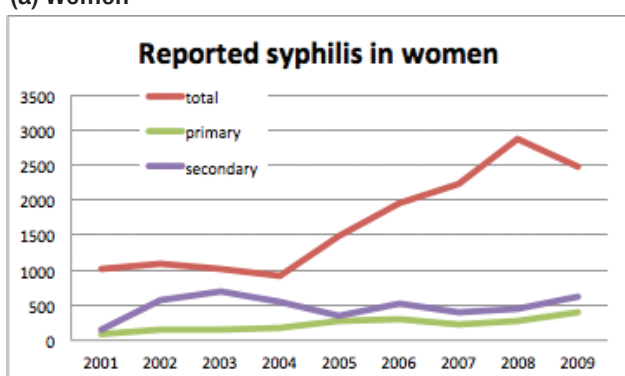
Stronger efforts are clearly needed for better control of infectious syphilis in a few countries in the Western Pacific Region, and routine reporting of new cases and prevalence data provides critical information to guide the response. Case report and prevalence data must be analysed separately, however, as illustrated in the following case study from Mongolia (see Box 5).

Box 5: Disaggregating syphilis cases in Mongolia

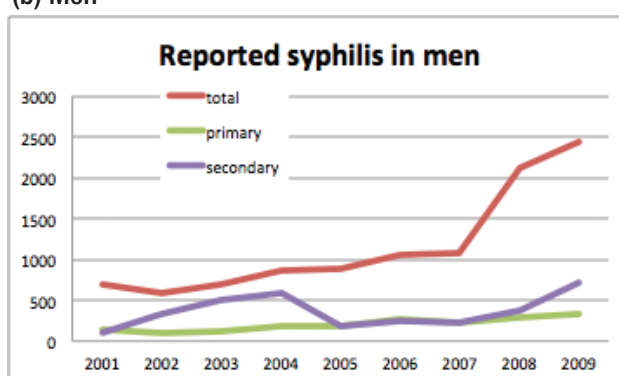
Syphilis remains a persistent problem in Mongolia despite impressive efforts to slow sexual transmission, which are credited with preventing emergence of an HIV epidemic. One area of clear success is the scale-up of syphilis screening for pregnant women beginning in 2005. As a result, many latent syphilis cases were detected, as illustrated by the sex-disaggregated data in Figure 2.3. Figure 2.3 (a) shows that the total number of syphilis case reports for women began to rise in 2005, while Figure 2.3 (b) shows the same for men in 2008 (when partner screening and treatment were strengthened). Separating case reports of primary and secondary syphilis from latent cases allows the programme to distinguish the results of the screening programme (prevalence monitoring) from symptomatic case reports (disease incidence).

Figure 2.3 Syphilis case reports from Mongolia, 2001–2009

(a) Women



(b) Men



Source: Ministry of Health, Mongolia, unpublished data, 2014.

Comprehensive programmes for syphilis control have been initiated in some countries. Progress in syphilis control in China, for example, is evident from the analysis of both incident case reporting of early syphilis and prevalence data (see Box 6).

Box 6: Syphilis elimination in China

Based on the national and province-level programmes and policies for syphilis control and the local situation in Shenzhen, which was experiencing an epidemic of STIs, the Shenzhen health authorities have taken a series of important steps to control syphilis and other STIs. Government endorsement of several key policy documents represents important political commitment to prevention and control of syphilis in Shenzhen. In the last five years, local government bodies have invested around 8 million yuan (US\$ 1.3 million) each year for syphilis control in addition to investments from central government. Approximately half the financial inputs are used for PMTCT of syphilis.

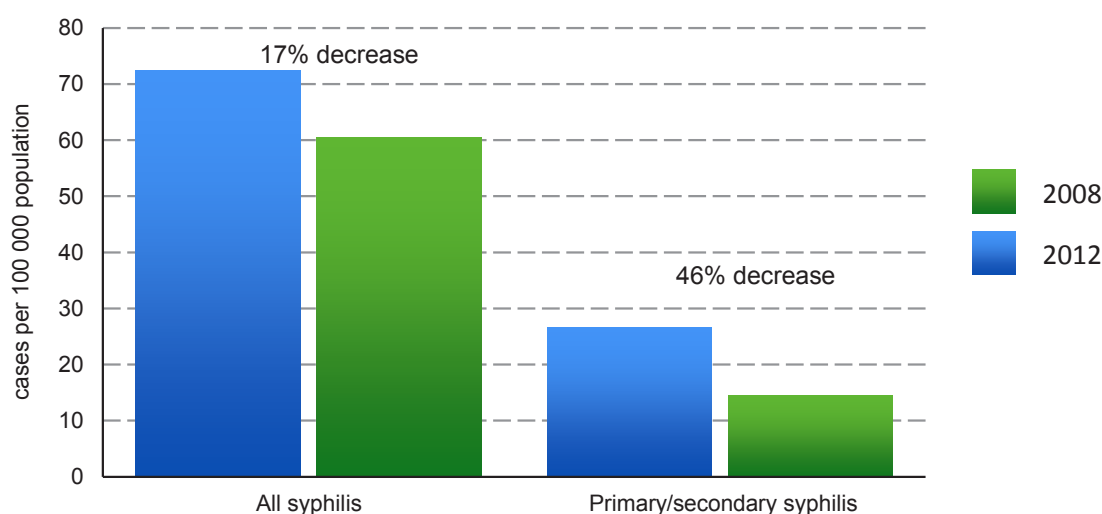
The comprehensive nature of the strategy is apparent from its components, which include:

- integrated syphilis and HIV prevention work, with expanded syphilis screening, early diagnosis and treatment of syphilis;
- enhanced syphilis screening among pregnant women to prevent congenital syphilis;
- comprehensive interventions among high-risk groups to prevent syphilis transmission;

- construction of standard STI clinics;
- centralized syphilis management and treatment to achieve integration of “prevention–treatment–management” of syphilis cases;
- improved laboratory quality assurance;
- established and strengthened syphilis surveillance system;
- strengthened capacity-building.

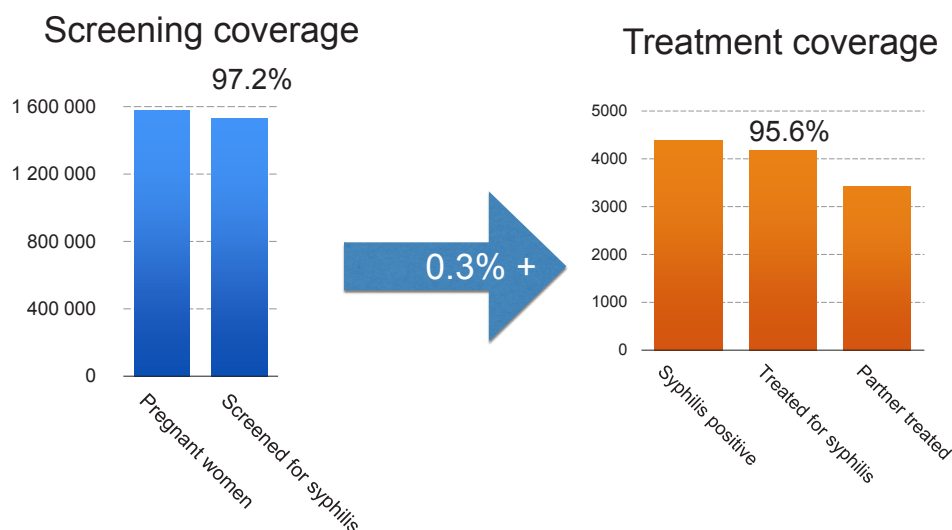
Outcomes measured through the surveillance system suggest that the programme is having a significant impact. Between 2008 and 2012, there was an overall decline in syphilis reports of 17%, while the reported rate of primary and secondary syphilis, a more accurate indicator of actual transmission trends, declined a full 46% (see Figure 2.4).

Figure 2.4 Syphilis case reports, Shenzhen, China, 2008 and 2012



During the same period, syphilis prevalence dropped significantly among nearly all higher-risk populations reached by screening programmes. Among pregnant women, syphilis prevalence is low and stable at 0.3% with nearly universal screening uptake and treatment of those testing positive for syphilis (Figure 2.5).

Figure 2.5 Coverage of screening and treatment, Shenzhen, China, 2008 and 2012



2.2 Genital ulcer disease

Genital ulcer disease (GUD) is commonly caused by herpes simplex virus (HSV-2) or primary syphilis. Chancroid (*Haemophilis ducreyi*) persists in areas where men are not circumcised and condom use in sex work is low, while LGV (lymphogranuloma venereum) outbreaks have been reported mainly among MSM populations. Whatever the causative agent, GUD is the most important STI cofactor for HIV, increasing transmission probabilities in unprotected sex up to several hundred times.

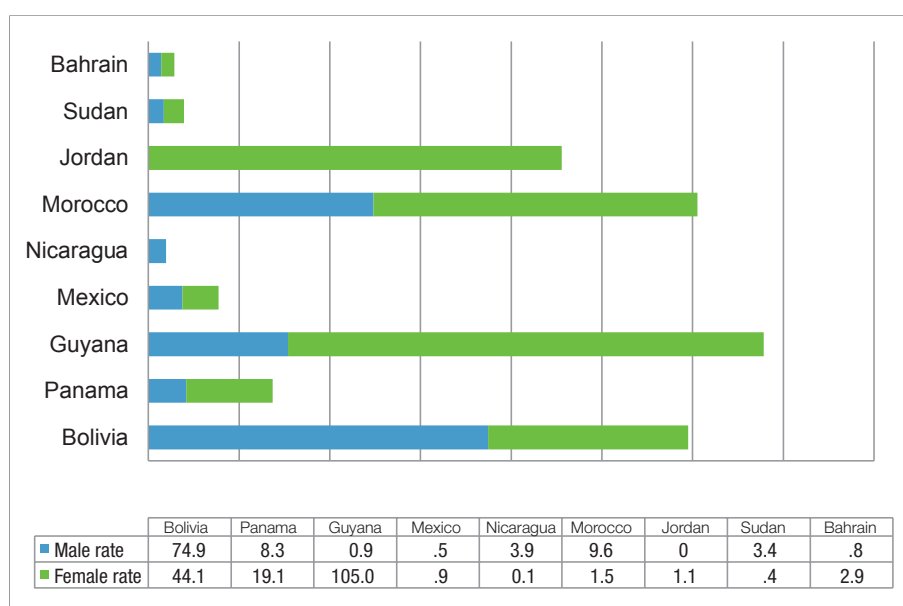
GUD trends are also good indicators of the performance of STI/HIV control efforts. GUD rates have decreased rapidly in countries that have improved prevention efforts, particularly among highest risk populations such as sex workers. A rising GUD trend, on the other hand, is a cause for

concern as it strongly suggests that sexual transmission is increasing, at least in some sexual networks.

Indicator 6: Number of adults reported with genital ulcer disease

Until now, GUD data were not routinely collected at the global level. For 2012, reporting was piloted in two WHO regions and was incorporated in GARPR starting in 2013. Figure 2.6 shows 2012 pilot study data from the Region of the Americas and the Eastern Mediterranean Region. Data were collected from five countries in the former and four countries in the latter region. Variability in reported rates may reflect differences in service provision and reporting, as well as disease patterns. However, it is clear that syndromic management is being used in some countries.

Figure 2.6 Genital ulcer disease (cases per 100 000 adults) in two pilot regions, 2012



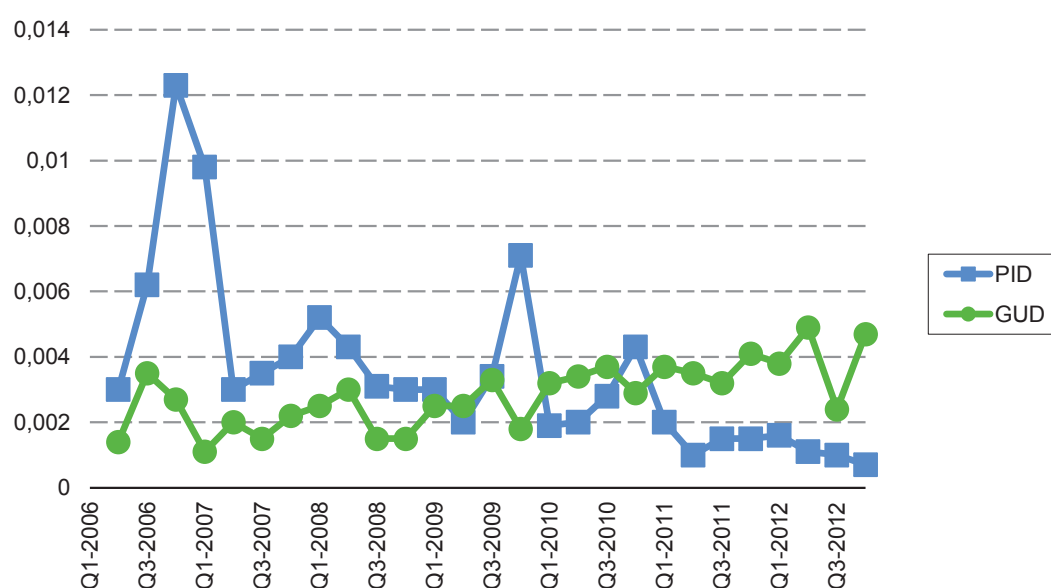
Source: GARPR 2013, unpublished data.

Box 7: Identifying areas of increasing sexual transmission in Cambodia

Monitoring of STI trends provides valuable information even in countries that have succeeded in controlling their STI and HIV epidemics. Using second-generation surveillance methods, Cambodia documented large reductions in HIV, syphilis, chancroid and gonorrhoea over 10 years ago.

Cambodia's National Center for HIV/AIDS, Dermatology and STD (NCHADS) continues to closely monitor STI trends – using syndromic case reports – as indicators of sustained programme effectiveness. Figure 2.7 shows progressive declines in rates of lower abdominal pain (LAP), the symptom used as a basis for syndromic diagnosis and presumptive treatment of pelvic inflammatory disease (PID), among female entertainment workers. This is a common consequence of untreated gonorrhoea and chlamydia among female sex workers in many places and declining trends reflect improved clinical services and shorter duration of infection. During the same period, however, cases of ulcerative STIs (e.g. GUD) are shown to have increased (see Figure 2.7).

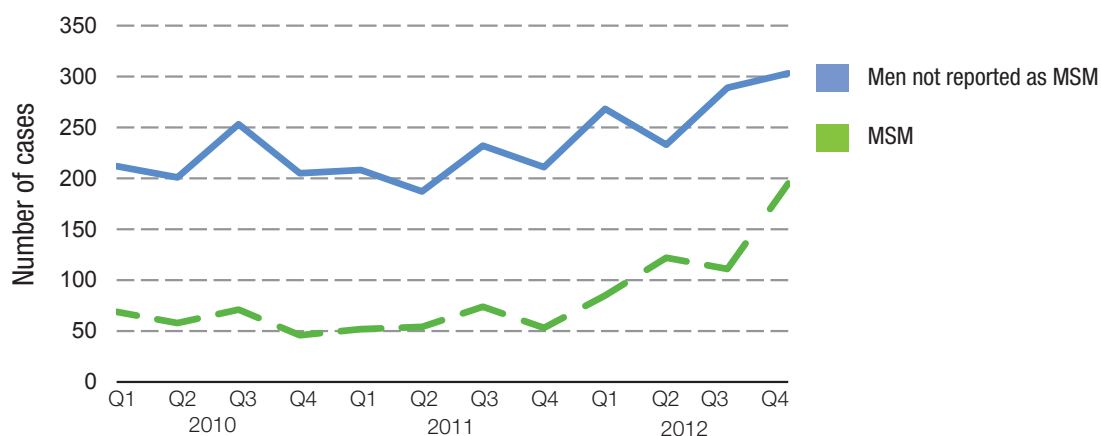
Figure 2.7 Proportion of female entertainment worker clinic visits resulting in a diagnosis of pelvic inflammatory disease (PID) and genital ulcer disease (GUD) in Cambodia, 2006–2012



Source: NCHADS database (www.nchads.org)

Other data show GUD cases also increasing among men. Further investigation revealed that the largest increase was among MSM (see Figure 2.8), and that most cases could be traced to just four urban clinics.

Figure 2.8 Cases of genital ulcer disease (GUD) among men who have sex with men (MSM) and men not reported as MSM in Cambodia, 2010–2012



Source: NCHADS database (www.nchads.org).

In response, the national programme (NCHADS) is refocusing its prevention strategy on rapid assessment and analysis for action. One objective is to improve case-finding and treatment in areas with high STI rates, including through the use of methods to better detect recent HIV infection.

Sources National Center for HIV/AIDS, Dermatology and STD (NCHADS; www.nchads.org); WHO Western Pacific Regional Office, Joint review of the Cambodian national health sector response to HIV (in progress).

2.3 Urethral discharge and gonorrhoea in men

Urethral discharge (UD) is a common STI syndrome among men. It is easy to identify and almost always sexually transmitted. UD is thus a good indicator for monitoring disease trends and for assessing STI prevention and control efforts. Many UD cases caused by gonorrhoea can be accurately diagnosed using Gram stain of urethral exudate, a test which is moderately sensitive and specific, inexpensive, and feasible in basic laboratory settings. Sites with at least this level of laboratory capacity can also report gonorrhoea cases (in addition to UD) following the standardized case definition.

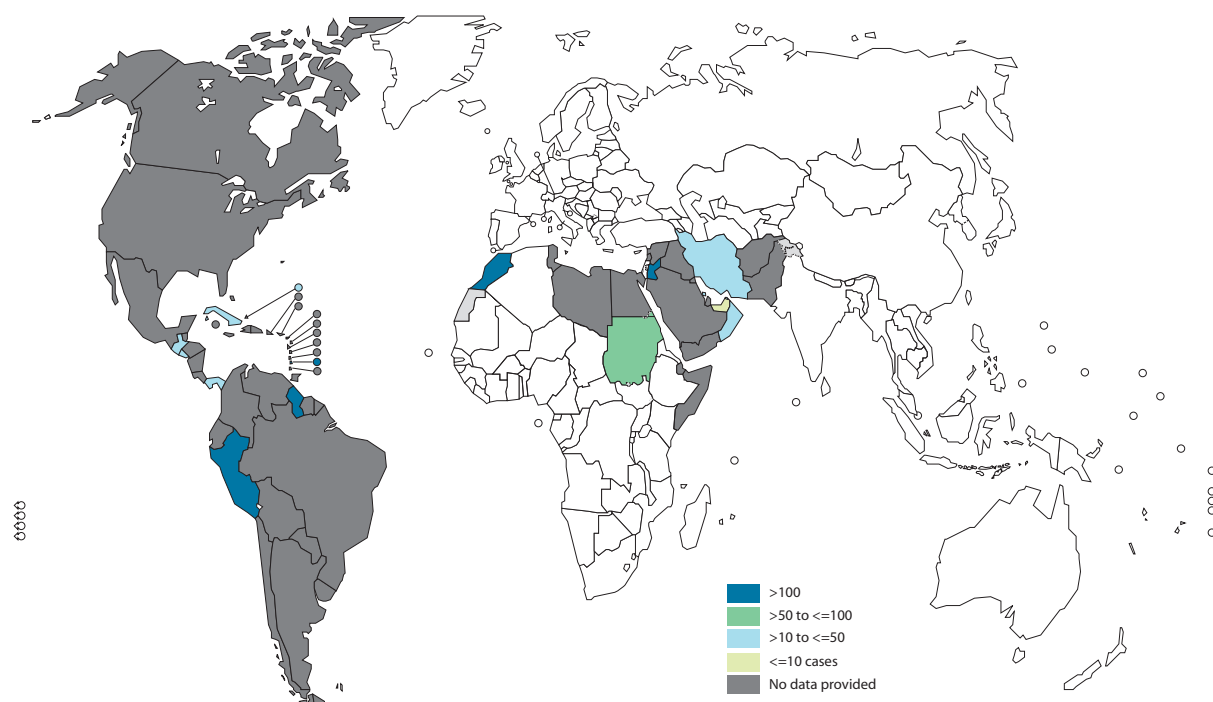
Through a GARPR pilot exercise in two regions, data were collected on UD and gonorrhoea among men (see Figures 2.9 and 2.10). These data show that the majority of countries reporting on either of these indicators report on both UD and gonorrhoea (Bahrain, Cuba, El Salvador, the Islamic Republic of Iran, Guatemala, Nicaragua, Oman, Panama and

United Arab Emirates). Further work is needed to understand how syndromic and etiologic reporting are related and how countries interpret and use these data. Given the likely variation in case definitions and methodology for data collection, it is not advisable to make comparisons between countries. However, monitoring trends over time within a given country may prove valuable.

Indicator 7: Number of men reported with urethral discharge

Until now, UD data were not routinely collected at the global level. For 2012, reporting was piloted in two WHO regions and was incorporated in GARPR starting in 2013. Figure 2.9 shows 2012 pilot data from the WHO Region of the Americas and the Eastern Mediterranean Region. Data were collected from seven countries in each region. Variability in reported rates may reflect differences in service provision and reporting, as well as disease patterns.

Figure 2.9 Urethral discharge rates among men (cases per 100 000 adult men) in two pilot regions, 2012

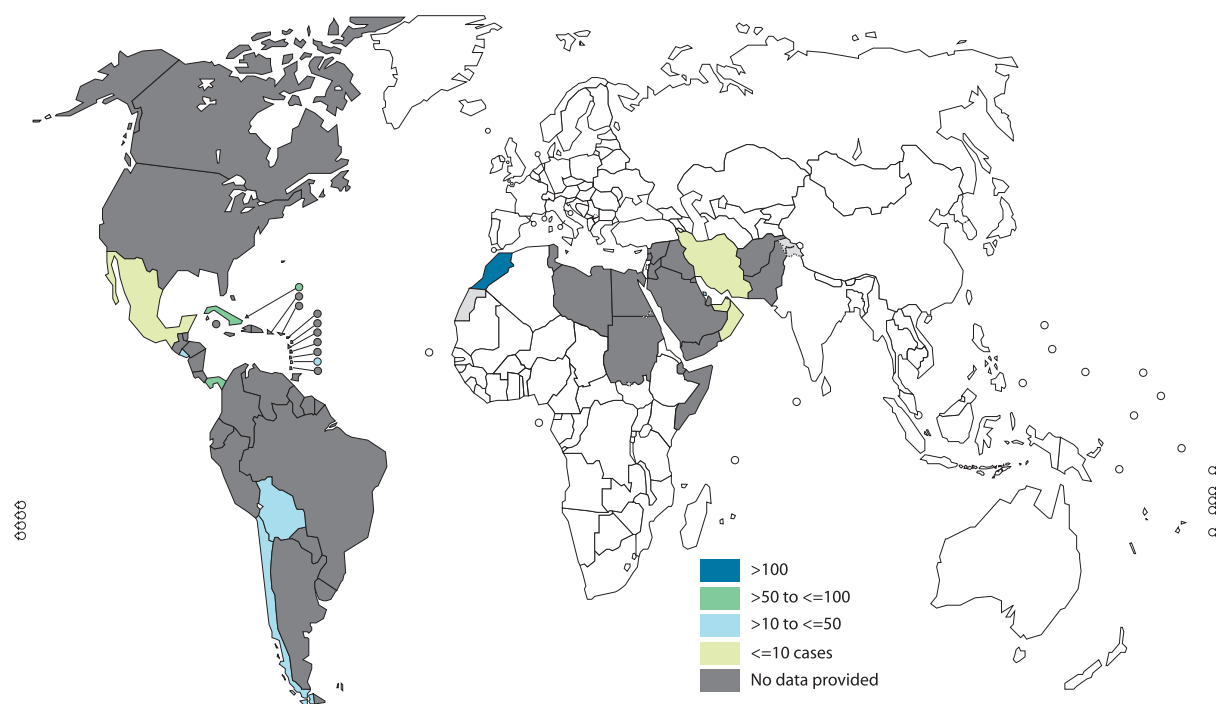


Source: GARPR 2013, unpublished data.

Indicator 8: Number of men reported with gonorrhoea

Until now, gonorrhoea data were not routinely collected at the global level. For 2012, reporting of male gonorrhoea cases was piloted in two WHO regions and was incorporated in GARPR for 2013 data collection. Figure 2.10 shows 2012 pilot study data from the WHO Region of the Americas and the Eastern Mediterranean Region. Data were collected from nine countries in the former and four countries in the latter region. Variability in reported rates may reflect differences in service provision and reporting, as well as disease patterns.

Figure 2.10 Gonorrhoea rates among men (cases per 100 000 adult men) in two pilot regions, 2012



Source: GARPR 2013 reporting, unpublished data.

3. STI control with key populations

Key points:

- Targeted condom and STI interventions in sex work and other high-risk networks lower prevalence in those networks and reduce STI/HIV transmission in the population overall.
- Syphilis prevalence among populations at highest risk, such as sex workers and men who have sex with men (MSM), are key indicators of progress.
- Syphilis prevalence among female sex workers is greater than 5% in at least one country in each region.

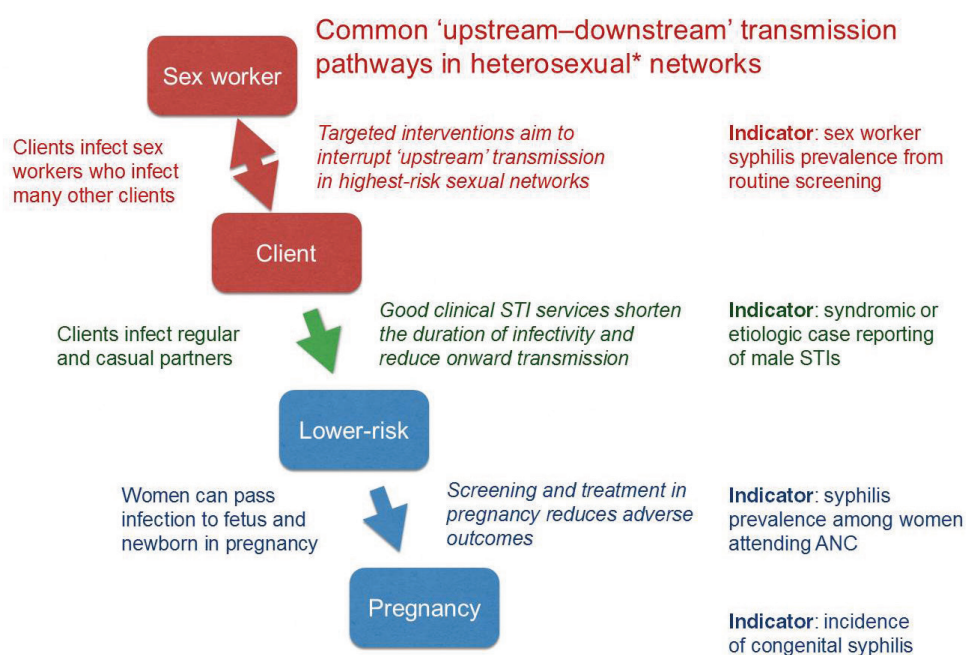
As outlined in WHO's current global strategy, an essential component of STI prevention and control is to slow transmission in the highest-risk sexual networks (1).

Figure 3.1 shows how high-incidence networks – sex workers and clients, for example – can drive transmission downstream in the general population, including among women who may transmit syphilis during pregnancy. Clients infect sex workers who can in turn infect many other clients, and also act as a bridge to extend transmission to lower risk partners outside sex work. The figure also shows how different STI indicators can be monitored as transmission markers at each level. Trends of these markers help programmes to assess whether progress is being made as a result of their prevention efforts.

3.1 STI control with female sex workers

Global experience highlights the importance of targeted STI control efforts in sex work networks to reduce transmission overall. Interventions including peer outreach, condom programming and STI services have been shown to be feasible and effective across countries and regions. Condom use reduces exposure while STI treatment shortens duration of infectiousness. Structural interventions, like 100% condom policies and community mobilization, change the conditions under which sex work takes place, thus reducing vulnerability, removing barriers and making direct interventions easier to adopt, more frequently applied and more effective. Peer-based outreach and interventions facilitate this work and provide a critical link between the sex worker community and public health interventions and services.

Figure 3.1 STI transmission dynamics and related indicators



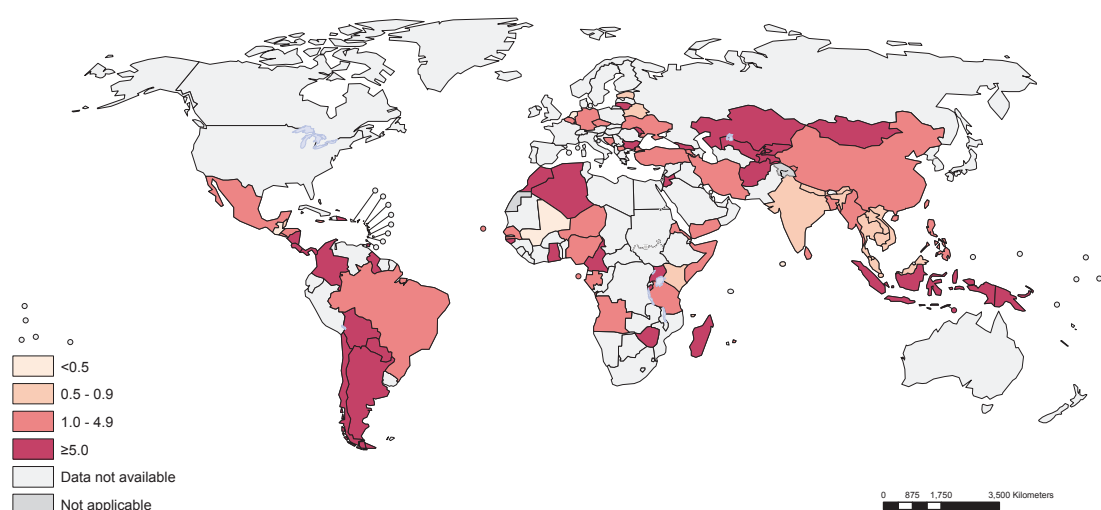
* similar transmission pathways operate in MSM networks with male sex work

These approaches work for HIV as well as other STIs. HIV epidemics in Asia initially took off in areas with poor STI control fuelled by rapid transmission in sex work. Ulcerative STIs, including chancroid and syphilis, were strongly associated with HIV transmission and rapid measures to control these infections preceded HIV declines. Where targeted STI control efforts were implemented at sufficient scale, as in Thailand, Cambodia and more recently in India, HIV trends have followed declines of other STIs. Where STI prevalence was low to begin with, as in Sri Lanka, HIV epidemics have not taken off.

Indicator 9: Percentage of female sex workers (FSWs) with active syphilis

Syphilis prevalence has been found to be a sensitive marker of transmission in sex work – steadily declining trends are generally seen when targeted interventions are scaled up. Syphilis trends among sex workers are currently reported by a number of countries using routine reporting data or special surveys. On a global level, the prevalence of active syphilis (defined as being positive on both a treponemal and non-treponemal test) remains high – above 5% in at least one of the last five years – in all regions (see Figure 3.2).

Figure 3.2 Percentage of female sex workers with active syphilis (latest available data since 2008)



Source: WHO Global Health Observatory Data Repository (<http://gamapserver.who.int/mapLibrary/app/searchResults.aspx>).

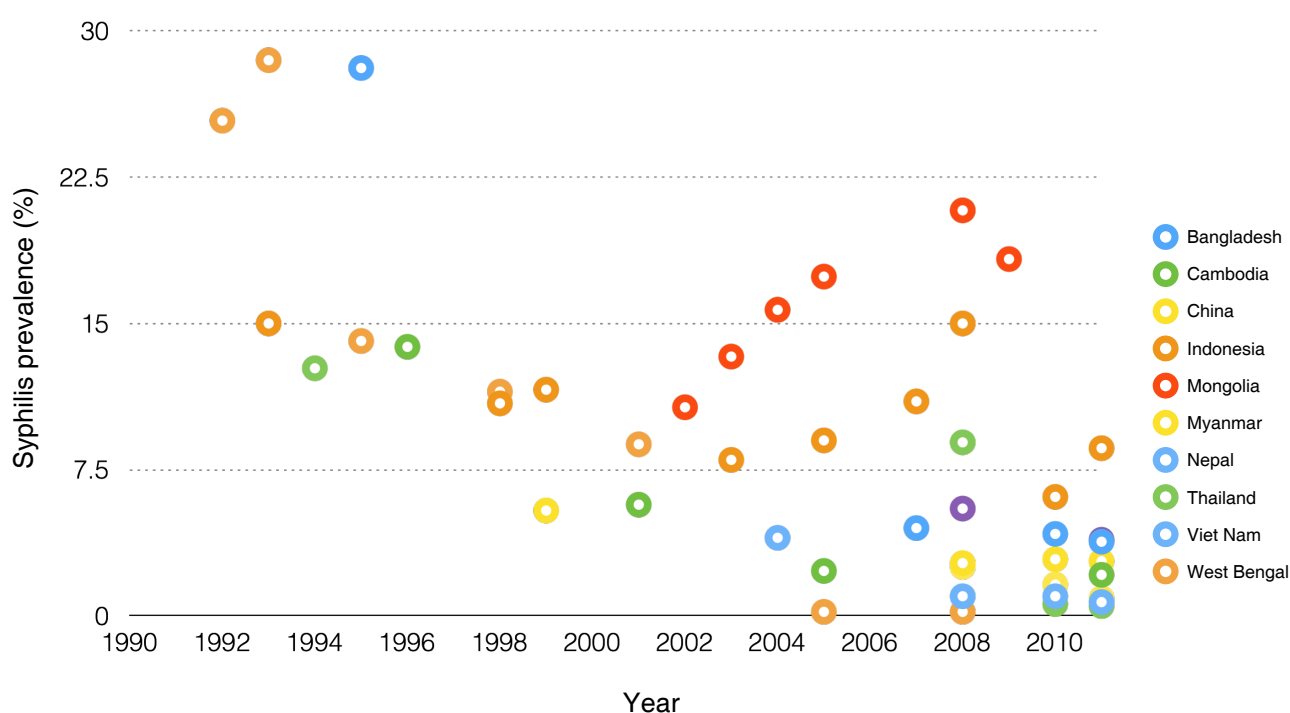
Analysis of trends in consistently reporting countries can help to better understand true trends in disease. For example, review of data on syphilis prevalence among sex workers in Asia over time shows a general decrease in prevalence, with some individual variations (see Box 8).

Box 8: Evidence of declining syphilis prevalence among sex workers in Asia

In a review of 10 Asian countries, recent syphilis prevalence among sex workers (reported through GARPR) is well below 10% in 8 countries, compared to 10–30% reported in the literature for 1990–2000 (see Figure 3.3) (14). Low syphilis prevalence among sex workers also correlates with low or declining prevalence among pregnant women in several countries where data are available – such as Cambodia, Thailand and Myanmar.

Dedicated interventions have contributed to the low prevalence of syphilis among sex workers in some countries. HIV prevention programmes for high-risk groups have stressed the importance of routine STI screening in these populations (see Box 9).

Figure 3.3 Trends in syphilis among female sex workers in 10 Asian countries, 1990–2012



Source: Steen, 2013 (14)

Box 9: Low syphilis prevalence among sex workers in the Philippines

HIV prevalence remains low in the Philippines, even among sex workers. STI data from routine screening thus provides important information about sexual transmission trends and the effectiveness of prevention efforts. In urban areas, social hygiene clinics provide STI screening and treatment for registered female entertainment workers and freelance sex workers, in some sites screening over a thousand women each week. Routinely reported data from 16 clinics show very low (0.12%) syphilis prevalence among both registered and freelance sex workers who attend the clinics and participate in screening.¹

1 Department of Health, Philippines. STI consolidated report: sentinel STI etiologic surveillance system. National Epidemiologic Centre, 2012.

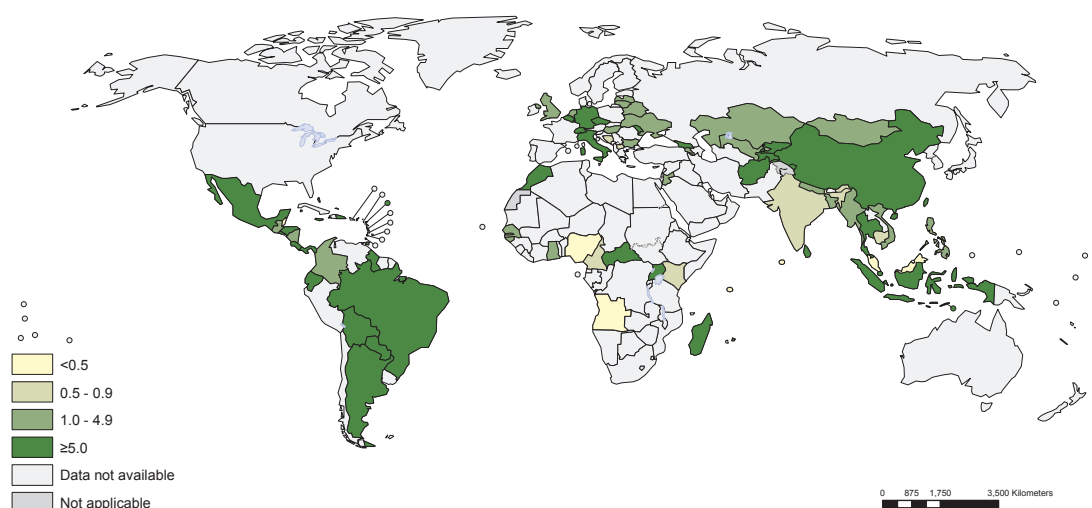
3.2 STI control for men who have sex with men and transgender persons

STIs including HIV can spread rapidly through MSM and transgender networks, where partner change tends to be high and condom use low. As with female sex workers, targeted interventions for MSM – including peer outreach, condom programming and STI services – have been effective in reducing transmission and are enhanced by structural interventions to reduce vulnerability and remove barriers to accessing services. Interventions for MSM and transgender sex workers are a priority and should be monitored with separate indicators.

Indicator 10: Prevalence of syphilis among men who have sex with men

Syphilis has been identified as a growing problem among MSM in a number of countries. Figure 3.4 shows variable prevalence trends from GARPR, which also reflect a diversity of data collection methods from routine reporting to special surveys. However, it is clear that the prevalence of active syphilis (defined as being positive on both a treponemal and non-treponemal test) among MSM, as for sex workers, remains high in all regions of the world. Such a great burden of disease among key populations signifies an ongoing need for STI services for these populations.

Figure 3.4 Percentage of men who have sex with men with active syphilis (latest available data since 2008)



Source: WHO Global Health Observatory Data Repository (<http://gamapserver.who.int/mapLibrary/app/searchResults.aspx>).

As part of GARPR reporting in 2012, a series of policy questions were asked of national HIV/STI programme managers. For STI services, questions focused on services for populations at highest risk – sex workers, MSM and people who inject drugs (PWID). Responses about STI services for sex workers and MSM were received from almost a third of countries, while one country in five reported on services for PWID (Table 3.1).

STI services for PWID were loosely defined as “STI prevention and treatment”. For MSM, the question was more specific, including STI management as well as screening for asymptomatic syphilis, gonorrhoea and chlamydia. For both populations, about four out of five countries that answered the question reported such services (Table 3.1).

For sex workers three specific questions were asked, reflecting a high level of programme attention to STI detection and treatment (see Table 3.1). More than nine out of ten responding countries reported treatment for symptomatic STIs. Six out of ten also reported treatment for asymptomatic STIs, and half as many reported provision of periodic presumptive treatment (PPT) for STIs.

Table 3.1 Responses to policy questions asked of national HIV/STI programme managers through GARPR (N=194 countries), 2012

Target population	Sex workers			Men who have sex with men (MSM)	People who inject drugs (PWID)
STI services provided	Symptomatic STI treatment	Screening for asymptomatic STI	Periodic presumptive STI treatment	STI management; including screening for symptomatic gonorrhoea, chlamydia and syphilis	STI prevention and treatment
Percentage of countries that responded to the questions	32.0% (62/194)			28.4% (55/194)	22.7% (44/194)
Percentage of responding countries reporting the intervention	91.9% (57/62)	59.7% (37/62)	29% (18/62)	78.2% (43/55)	81.8% (36/44)

Source: GARPR, unpublished data.

Indonesia is an example of a country that offers services for key populations (see Box 10).

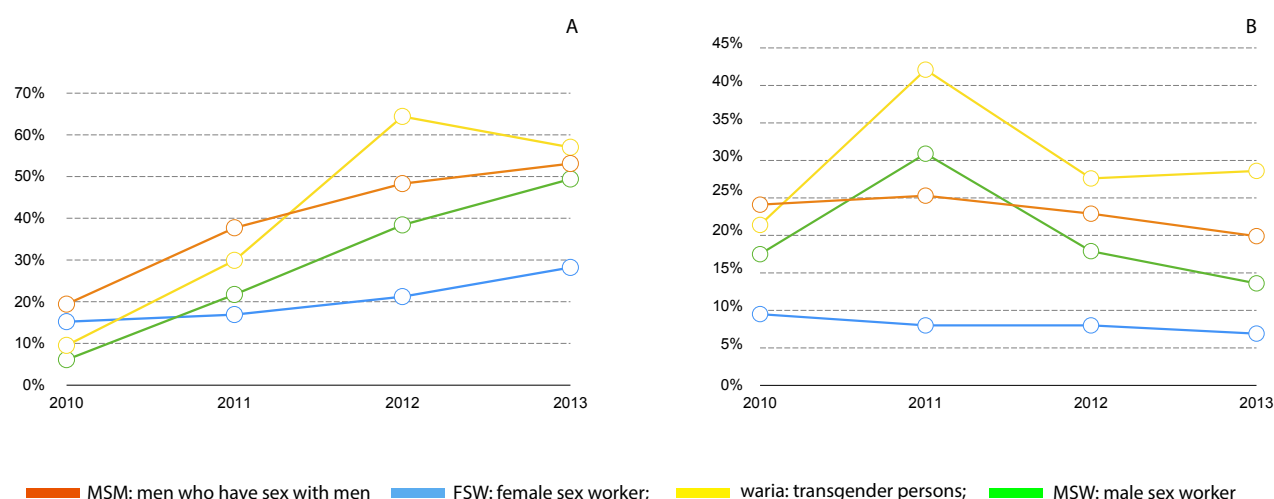
Box 10: Indonesia: monitoring syphilis among key populations

Indonesia is strengthening interventions for populations at highest risk, including female and male sex workers, *waria* (transgender persons) and MSM. Routine STI screening is promoted during regular check-ups and data from these routine services are monitored closely for trends.

Reporting from over a thousand service delivery sites has improved dramatically over four years. The proportion of sites submitting at least one report during the year has increased from 17% to 82%, while complete reporting (all monthly reports) has increased from only 10% of sites in 2010 to over 44% in 2013.

Figure 3.5 A shows that screening for syphilis has increased for each of the four key populations. Figure 3.5 B shows syphilis positivity rates, with possible declining rates in three of the four key groups. Although these data are likely subject to reporting bias due to the low level of reporting in earlier years, trends will be more reliable as reporting improves. Indonesia's Ministry of Health is increasingly prioritizing the use of routine data such as these to assess programme performance and monitor STI trends.

Figure 3.5 Syphilis prevalence monitoring among key populations in Indonesia:
(a) proportion screened for syphilis, (b) syphilis positivity rate, 2010–2013



Source: Ministry of Health, Indonesia, unpublished data, 2013.

4. Building reliable reporting systems

Key points:

- Reliable data are needed to guide STI control programmes.
- Case reporting and prevalence monitoring through routine STI service delivery are readily available sources of data for geographic and trend analyses.

Last year's report on global STI surveillance described WHO efforts to strengthen STI surveillance, including dissemination of new guidelines (3) and a roadmap for strengthening routine reporting, as well as renewed attention to monitoring antimicrobial resistance through Gonococcal Antimicrobial Surveillance Programme (GASP) (2). This year we report on progress in some of these areas, including country experiences and inclusion of new STI indicators for the Global AIDS Response Progress Reporting (GARPR) System.

4.1 Assessing and strengthening routine STI reporting

Assessments of STI reporting systems were conducted in eight countries – Argentina, Cambodia, China, Indonesia, Mongolia, the Republic of Moldova, Uruguay and Zimbabwe – as part of the global roadmap to improve the reliability and comparability of routinely reported STI incidence and prevalence data. A standardized checklist was used to collect data from surveillance databases, key informant interviews and reporting sites.

All national assessment teams recognized weaknesses in existing reporting. Main problems identified included: (1) non-standardized case definitions, (2) aggregation of incident case reports with prevalence data from screening, (3) problems linking clinical and laboratory data, and (4) operational factors affecting the completeness, timeliness and quality of reported data. Country priorities for strengthening STI surveillance included addressing these issues to achieve more reliable case report data, as well as extending coverage of routine syphilis screening and prevalence monitoring for pregnant women, sex workers and MSM.

Box 11: Efforts in the Republic of Moldova and the WHO European Region to strengthen antenatal STI screening and reporting

Interventions and surveillance are complementary activities. As part of the WHO roadmap for strengthening STI reporting, the Republic of Moldova conducted an in-depth review of its STI surveillance activities in 2013 (15). The overall assessment was that the STI surveillance system in the country is well structured, but minor revisions of the STI electronic case-reporting system, including revision of case definitions and STI management guidelines, as well as quality assurance of STI diagnostics to bring routine practices into line with international evidence-based standards and guidelines, would improve the amount and quality of information necessary for better targeting of STI interventions.

Following the review, a number of recommendations are being addressed. National case definitions and STI treatment guidelines are being reviewed and updated. Several laboratory technicians have been trained in international-standard STI laboratory techniques. Guidelines for syphilis screening during ANC and delivery have been updated to ensure that previously unregistered pregnant women who come in only at delivery, such as migrants labourers, will receive services, and that reporting will capture not only the serological status of all pregnant women at 12–16 weeks and 28–32 weeks, but will also report on the proportion of ANC attendees tested for syphilis at their first ANC visit.

Overall, the review demonstrated that the Republic of Moldova's Ministry of Health has made a strong commitment; there is dedicated leadership, technical expertise and a well-structured STI surveillance system. The qualified professional staff is enthusiastic, keen to acquire modern information and improve the programme. This combination provides a strong foundation for a highly effective STI surveillance system and STI control and prevention programme. The country hosted a congenital syphilis elimination pilot and shows strong interest in validating elimination.

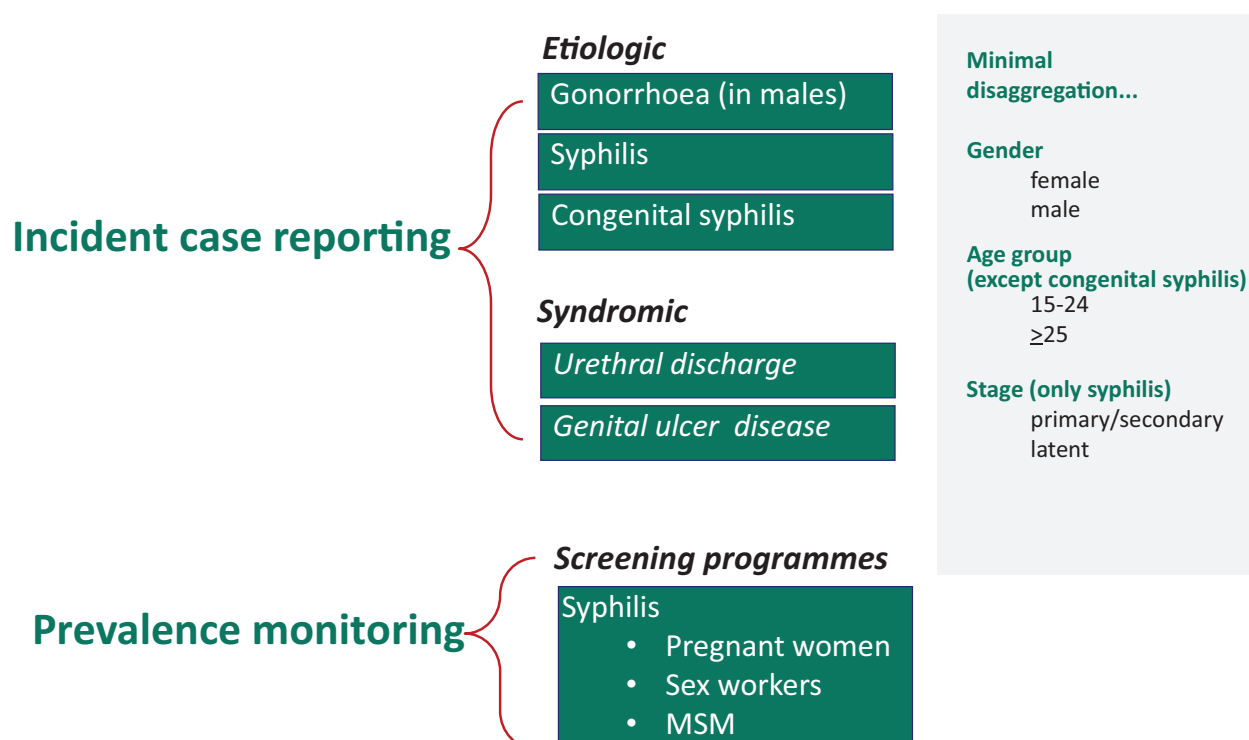
Within the WHO European Region more broadly, serious attention and efforts are being focused on capacity-building for STI surveillance. The WHO collaborating centre based in Zagreb, Croatia, offers assistance on planning and implementing surveillance activities including surveys, studies and dedicated regional and in-country training courses. In 2013, a revision and update of the regional STI training module was undertaken in collaboration with WHO headquarters and the United States Centers for Disease Control and Prevention (CDC), and a training module is currently in the final stage of revision. The Centralized Information System for Infectious Diseases (CISID) of the WHO European Region compiles incidence case report data disaggregated by sex and age. There are ongoing efforts in the WHO European Region to further improve the quality of STI data covered within CISID.

4.2 Using syndromic information together with etiologic data to improve programmes

The value of etiologic data on the prevalence and incidence of syphilis in different populations has been illustrated in previous sections. Unfortunately, for most other STIs, accurate and feasible diagnostic tests are not available or affordable. Even where advanced laboratory capacity is available, it is generally not universally accessible but limited to a few reference laboratories. This limitation reduces its utility for surveillance purposes which – as in the syphilis example – depends on the continuous flow of data from all health-care facilities.

Syndromic reporting is a useful workaround for this problem. In the WHO STI surveillance roadmap, WHO recommends that countries using syndromic management prioritize reporting of two common STI syndromes – genital ulcer disease (GUD) and urethral discharge (UD) – from all sites, in addition to etiologic reporting on gonorrhoea, syphilis, and congenital syphilis from sites with higher laboratory capacity (see Figure 4.1).

Figure 4.1 Recommended STI indicators for routine reporting



4.3 Piloting new STI indicators for HIV programmes

In 2013, new STI indicators were piloted in two WHO regions – the Eastern Mediterranean Region and the Region of the Americas – through the GARPR mechanism. For the first time, countries were asked to report sex-disaggregated data on GUD and UD syndromes, and etiologic diagnoses of adult and congenital syphilis and male gonorrhoea cases.

Results of the pilot are presented in Chapters 1 and 2 of this report. Considerable variability can be seen in the data reported by countries in these two regions. This is likely due to a number of factors that were highlighted in last year's report, which examined STI data retrieved from online sources. These factors include differences in case definitions, service delivery approaches, and screening and

reporting patterns. For example, a country with an active antenatal syphilis screening programme is likely to identify more cases of syphilis (with a higher proportion among women) than a country where few women are screened in pregnancy.

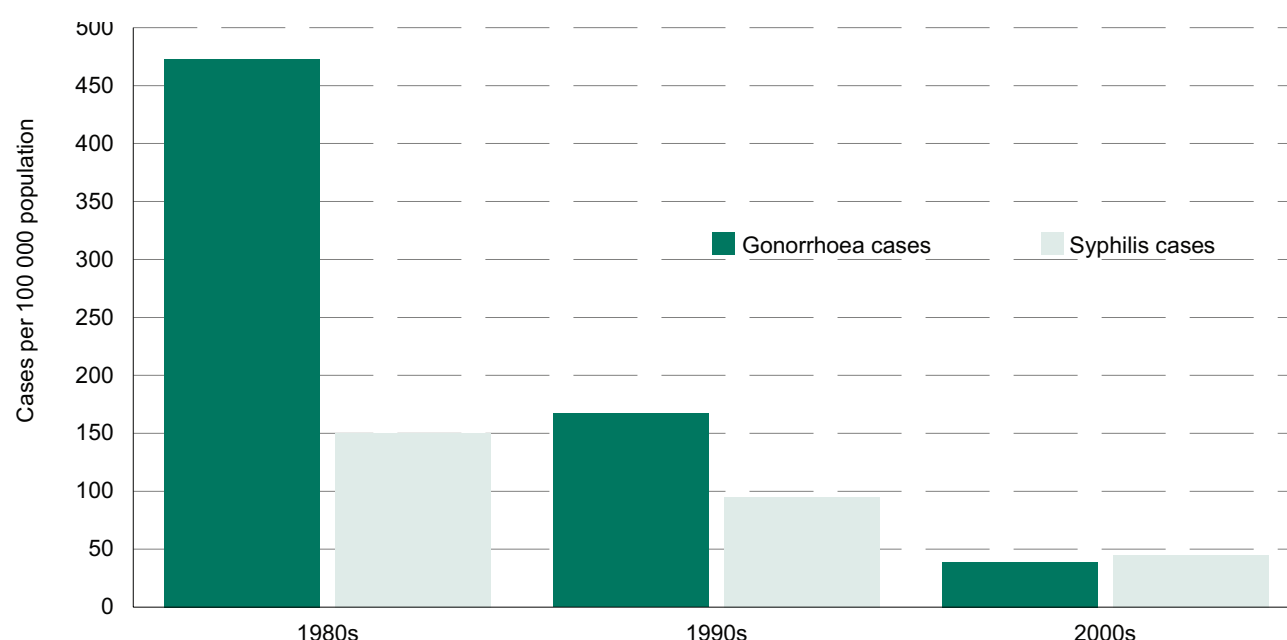
Cross-country comparisons are thus not possible at this stage without more information about country-specific protocols and reporting methods. Within each country, however, assuming that methods are fairly consistent from year to year, STI trends can be monitored over time to identify transmission patterns and assess the performance of control efforts. Examples of such trends can be found in Box 12, which examines regional data from Latin America and the Caribbean over several decades.

Box 12: STI surveillance in Latin America and the Caribbean – an example of regional progress

According to global estimates for 2008, a quarter of all new cases of curable STI (chlamydia, gonorrhoea, syphilis and trichomoniasis) occurred in the Americas (11). Understanding the epidemiology of STIs in Latin America and the Caribbean (LAC) based on reliable surveillance data is a high priority for WHO/PAHO.

Reported figures for newly diagnosed syphilis and gonorrhoea cases are available from as far back as 1980 for 14 Caribbean countries participating in Caribbean Epidemiology Center (CAREC) regional surveillance. Data from eight Caribbean countries that have reported gonorrhoea and syphilis cases (in adults of both sexes) for most years since 1980 show declining incidence rates (see Figure 4.2), suggesting that STI control in the English-speaking Caribbean has been steadily improving over the last three decades.

Figure 4.2 Gonorrhoea and syphilis rates reported by eight Caribbean countries (mean), by decade

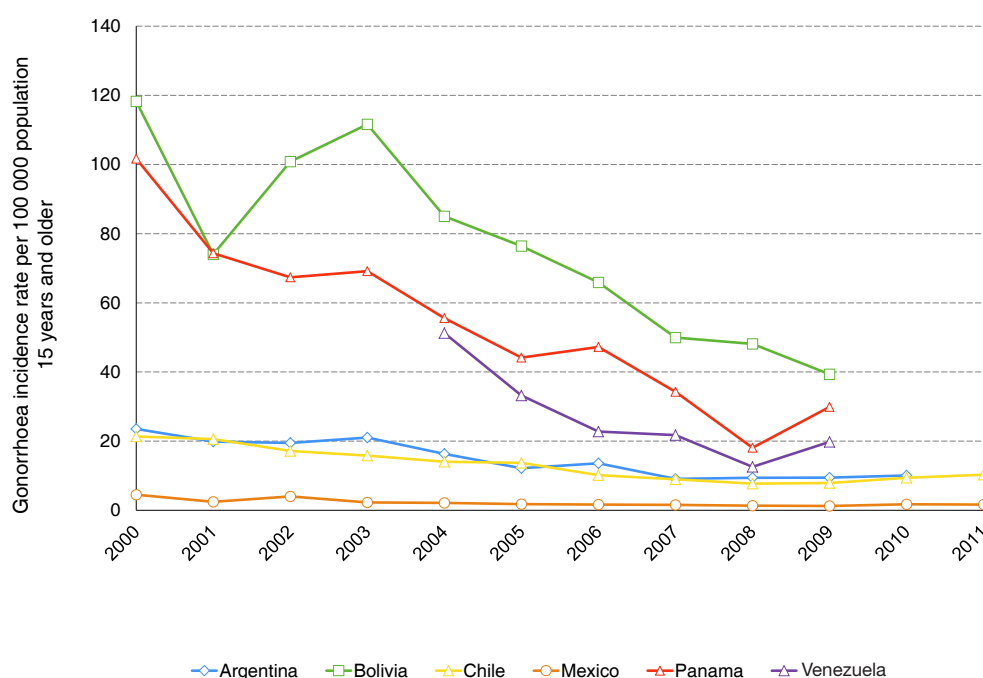


Note: The eight countries are: Bahamas, Belize, Cuba, Grenada, Guyana, Jamaica, Saint Lucia, and Saint Vincent and the Grenadines.

For Latin America, a review of published country epidemiologic bulletins and studies available through the Web shows that 22 Latin American countries (63% of 35 reviewed countries and territories) published syphilis and gonorrhoea incidence rates in 2009. Among Latin American countries with consistent reporting, gonorrhoea case reports show declining trends since 2000 (Figure 4.3).

STI prevalence monitoring is a more recent surveillance activity that began with monitoring results of routine syphilis screening among pregnant women. Reporting of antenatal syphilis prevalence data is increasing in the WHO Region of the Americas; 14 countries reported in 2008, rising to 18 in 2012. Countries have also monitored syphilis prevalence among sex workers and MSM but mainly through special studies, which are costly and have differing sampling methodologies. Routine screening for syphilis is now recommended for sex workers and MSM as part of interventions, with regular monitoring of prevalence trends.

Figure 4.3 Gonorrhoea incidence rates reported by select Latin American countries, 2000–2011



Note: Full country names are: Plurinational State of Bolivia; Bolivarian Republic of Venezuela

In addition to routine case reporting and prevalence monitoring, the monitoring of STI etiologies and antimicrobial resistance (AMR) to ensure availability of effective treatments are also important pillars of STI surveillance systems. Eleven countries in the WHO Region of the Americas participated in a retrospective analysis of the susceptibility of *N. gonorrhoeae* isolates to antibiotics and national treatment guidelines for the years 2000–2009, which found an evolving resistance to ciprofloxacin and azithromycin and decreased susceptibility to ceftriaxone (16). These activities are being strengthened under the regional (GASP).

Regional efforts to strengthen routine STI reporting facilitate better understanding of regional trends and comparisons across countries while enabling programmes to strengthen STI control efforts and monitor progress. WHO/PAHO continues to promote standardization of reporting and support improvements in national STI surveillance systems as part of its strategy to improve the sexual health of populations in the Americas.

Source: Pan American Health Organization, 2013.

5. Gonococcal Antimicrobial Surveillance Programme (GASP)

Key points:

- Resistance of *N. gonorrhoeae* to commonly used antibiotics is increasing globally.
- Since 2002, at least 10 countries have reported confirmed treatment failure using extended-spectrum cephalosporins (ESCs), and 42 countries have reported decreased susceptibility to ESCs.

Initial emergence of *N. gonorrhoeae* resistance is often followed by rapid spread. Unrestricted access to antimicrobials, inappropriate selection and overuse of antibiotics, and suboptimal quality of antibiotics, as well as inherent genetic mutations within the organism contribute to the development of resistance.

AMR surveillance is essential to optimize treatment recommendations and detect emerging antimicrobial resistance. The majority of developed countries have established AMR surveillance systems. However, there is a lack of AMR data in many countries, especially those with a high burden of gonorrhoea. In addition, AMR data are not comparable across countries and are of varying quality, which hinders the early detection of emerging resistance.

5.1 Aims, structure, coordination and participation

WHO coordinates GASP, which consists of six regional networks/reference centres supporting participating laboratories in over 60 countries. GASP aims to:

- ensure adequate sentinel antimicrobial resistance (AMR) surveillance in order to inform national treatment guidelines;
- establish a strategy to rapidly detect patients with gonococcal infection who experience a clinical and/or microbiological treatment failure following treatment with recommended cephalosporin therapy; and
- inform the effective clinical management of infected patients and their sexual partners.

The regional GASP networks are coordinated by regional reference laboratories that have been developing and implementing surveillance of antimicrobial susceptibility to obtain accurate information on gonococcal AMR, supporting countries to ensure valid and quality assured data through enhancing laboratory capacity, and supporting laboratory external quality assessment systems. Region-specific manuals for gonorrhoea

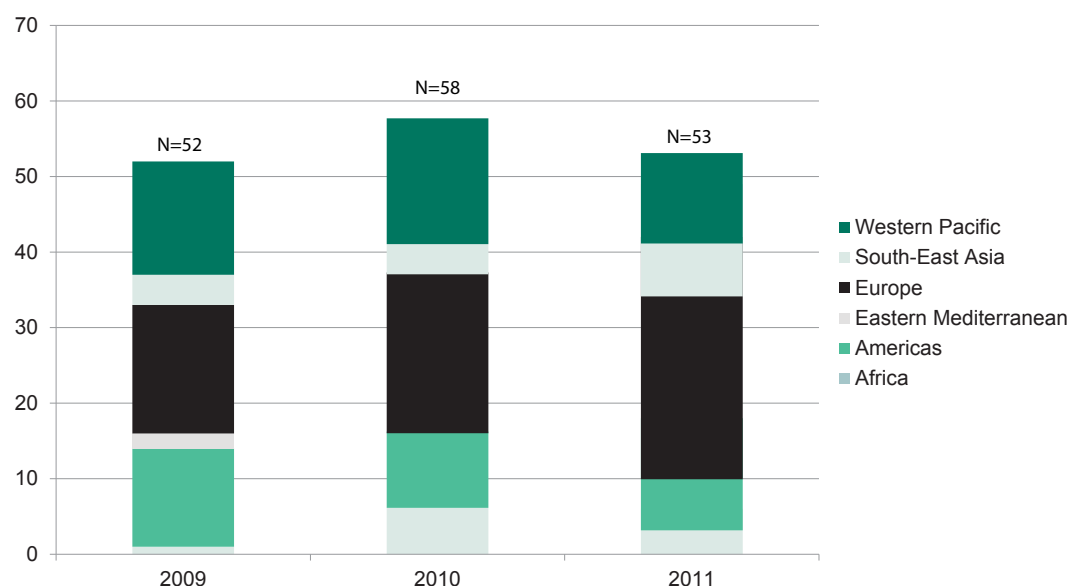
culture and susceptibility testing and laboratory quality assurance systems have been developed and laboratory training sessions have been conducted to ensure quality laboratory testing. GASP collates and analyses data on AMR and disseminates the results through peer-reviewed journals and WHO publications.

WHO works with regional reference laboratories to coordinate the GASP network and works with country governments to monitor AMR in *N. gonorrhoeae* and implement activities to prevent and respond to AMR. WHO's Department of Reproductive Health and Research also coordinates with the Global AMR initiative to ensure monitoring of AMR in *N. gonorrhoeae* and to address cross-cutting issues such as advocacy, rational use of antimicrobials and research for new technologies.

As an example, the WHO European Region, responding to the threat of untreatable gonorrhoea, supports efforts to expand GASP to the eastern part of the region. Dedicated missions supporting reviews of STI lab diagnosis and *N. gonorrhoeae* AMR monitoring were implemented in Kazakhstan, Kyrgyzstan and Tajikistan. These issues were also addressed by the STI surveillance review mission implemented in the Republic of Moldova in 2013 (see Box 11 in Chapter 4). The WHO STI collaborating centre in Orebro, Sweden, assists countries to develop and strengthen AMR monitoring capacities, including training courses for national STI laboratory experts and distance supervision of dedicated staff in a number of eastern European countries.

The number of countries continuously participating or partially participating in GASP reflects the changing laboratory capacity and availability of financial support to conduct AMR testing and surveys. The number of countries reporting AMR data on cephalosporins, azithromycin, or quinolones for *N. gonorrhoeae* remains similar from 2009 to 2011: 52 countries reported in 2009 (27% of WHO Member States), 58 (30%) in 2010, and 53 (27%) in 2011 (Figure 5.1).

Figure 5.1 Number of countries contributing data on antimicrobial resistance (AMR) to cephalosporins, azithromycin, or quinolones, 2009 – 2011



Source: WHO/GASP, 2014 (see Annexes 4 and 5 for data and further information).

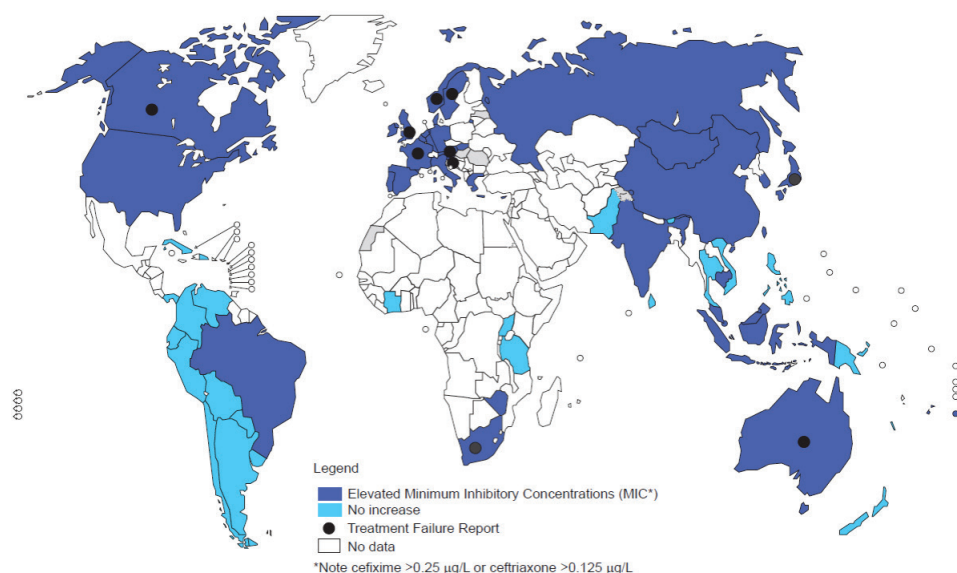
5.2 Antimicrobial resistance patterns

Antimicrobial resistance (AMR) in *N. gonorrhoeae* is increasing in prevalence, which compromises effective treatment and disease control efforts. High rates of penicillin, tetracycline and quinolone resistance have been recognized for many years, and these antibiotics are currently not recommended for gonorrhoea treatment in the majority of countries in the world. Antimicrobial resistance to newer antibiotics such as azithromycin has also emerged. There are increasing reports of clinical treatment failures and decreased susceptibility to cephalosporins, the last line of treatment for gonorrhoea, raising concerns that gonorrhoea may become untreatable.

Extended-spectrum cephalosporins

In 2002, Japan documented the first case of resistance to ESCs. This was followed by 10 other countries reporting ESC resistance and some countries reporting decreased susceptibility. In 2011, 28 (62%) of the countries participating in GASP reported decreased susceptibility to ESC through GASP (see Figure 5.2, and data in Annex 5). Since 2009, a cumulative total of 42 countries have reported decreased susceptibility to ESC. Nine countries reported decreased susceptibility in 2009–2010, but not in 2011.

Figure 5.2 Countries reporting elevated minimum inhibitory concentrations to extended-spectrum cephalosporins, 2011



Penicillin and quinolones

Resistance to penicillin and quinolone remains widespread globally. High levels of quinolone resistance – more than 90% – have been noted in the majority of Asian countries except for Australia, New Zealand and New Caledonia. Quinolone resistance of less than 50% has been noted in the majority of Latin American, Caribbean and European countries. Globally, all countries have reported more than 5% resistance, the cut-off point recommended by WHO to warrant a change in treatment guidelines for *N. gonorrhoeae*.

Azithromycin

Countries in the European GASP network have been conducting AMR testing for azithromycin. Moderate levels of resistance of more than 20% of isolates have been reported in Norway and Slovakia, and more than 10% resistance has been reported in Austria, Denmark and Slovenia. The majority of countries conducting AMR testing for azithromycin have shown low levels of resistance of less than 5%. In addition to European countries, Australia, Canada, Chile and the United States have conducted AMR testing. These countries have reported low levels of resistance.

Box 13: STI surveillance and GASP in countries of the WHO African Region

Starting with the first WHO global STI estimates in 1995, the African Region has consistently ranked highest in STI prevalence, and has ranked second only to the Western Pacific Region in absolute numbers of new infections. Yet, over recent years, prevalence data for general populations in African countries have become sparse and few etiological studies have been conducted. It is thus difficult to estimate the burden of STIs or identify the most prevalent STI pathogens in the region.

As part of WHO's STI surveillance roadmap, the WHO Regional Office for Africa conducted a survey to assess the adequacy of surveillance systems, including monitoring of antimicrobial resistance of *N. gonorrhoeae*. A questionnaire was sent out to each of the 47 countries covered by the WHO Regional Office for Africa, between March and July 2013; 14 countries (30%) responded. The findings relating to general STI surveillance efforts include:

- Ten of the 14 countries have routine surveillance activities for STIs.
- Most STI surveillance was based on syndromic reporting from all clinics (universal), while the remainder was from sentinel sites.
- Syndromic STI surveillance was used in nine countries while five countries indicated that etiological (predominantly syphilis serology) surveillance was also conducted.
- Four countries out of 13 (31%) responding to questions about etiological studies of organisms causing STI syndromes had conducted such a study in the past five years.
- Six countries had conducted STI prevalence studies in the past five years.

Responses to questions on AMR monitoring indicated that:

- Four countries out of 12 respondents (33%) had implemented activities to determine gonococcal antimicrobial susceptibility.
- Nine out of 12 responding countries (75%) stated that facilities to conduct gonococcal culture exist in their countries.

Only five countries (36% of the 14 respondents) have national STI control programme managers distinct from the HIV/AIDS programme managers. The Gambia and Swaziland reported that they have no STI programme.

Source: WHO Regional Office for Africa, unpublished survey data, 2013.

Conclusions

Data from scores of countries spanning all regions illustrate the scope and gravity of infections that spread through sexual contact. Yet, a growing number of countries in all regions are showing encouraging signs of progress in slowing sexual transmission and in reducing the burden of STIs on individuals, families and communities. On a global level, perhaps the most impressive recent gains can be seen in reductions of maternal and congenital syphilis. STI control is not limited to specific populations or diseases, however. Increasingly, countries are also finding ways to slow sexual transmission among high-risk and bridging populations, resulting in measurable improvements in STI control across the board.

In closing this report, we briefly sketch out some details from several countries to show what is possible, even in settings with limited resources, when comprehensive STI control interventions are well implemented. Countries such as Cuba and Sri Lanka offer a basic set of quality STI services that are widely accessible and include outreach to high-risk settings. Others, including Thailand, Cambodia and India, have also managed to change structural conditions in sex work resulting in large increases in condom use and rapid STI declines. Common to these examples are large and sustained STI reductions over time, and a strong commitment to prevention and control of HIV.

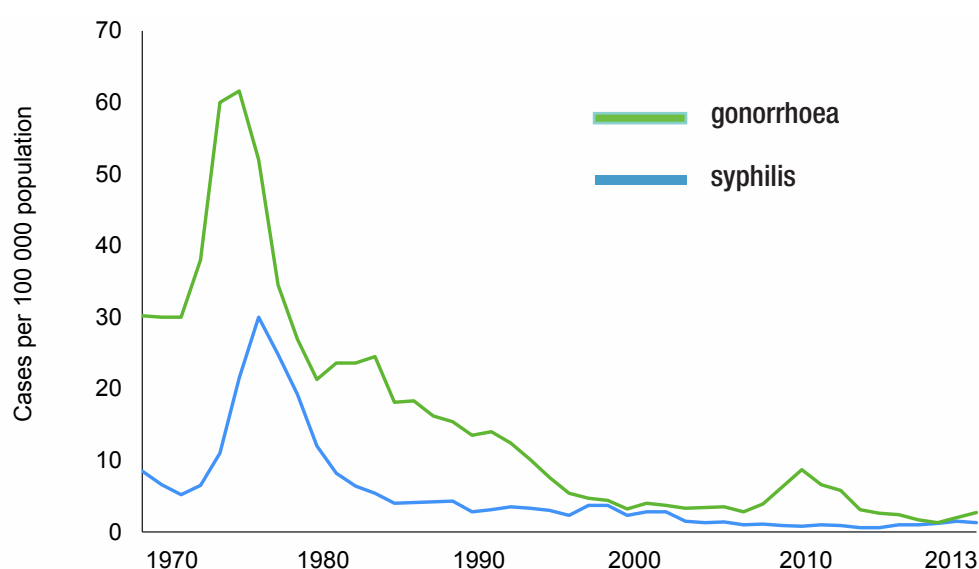
These experiences highlight three critical areas for countries that aspire to similar achievements in STI control:

- Basic STI services of good quality should be available and accessible to all who need them.
- Steps should be taken urgently to reduce high-incidence transmission in sex work and MSM networks.
- Reliable incidence and prevalence data from high-risk and general population groups should be routinely monitored to guide programme efforts.

When these three pieces come together, STI transmission can be slowed rapidly, bringing multiple benefits in terms of averted complications and fewer HIV infections. The following figures put some numbers on these public health benefits.

The experience of Sri Lanka can be described all the way from the 1970s to the present (Figure 6.1). STIs have been in decline over decades and were already low in the 1980s when HIV emerged globally. Continued strengthening of STI control and further declines helped to avert emergence of an HIV epidemic despite multiple factors, including an uncircumcised male population and a protracted civil war, that have facilitated growth of HIV epidemics in other countries.

Figure 6.1 Incident case report rates for gonorrhoea and infectious syphilis in Sri Lanka, 1970–2013



Source: National AIDS and STI Control Programme, Sri Lanka, 2013.

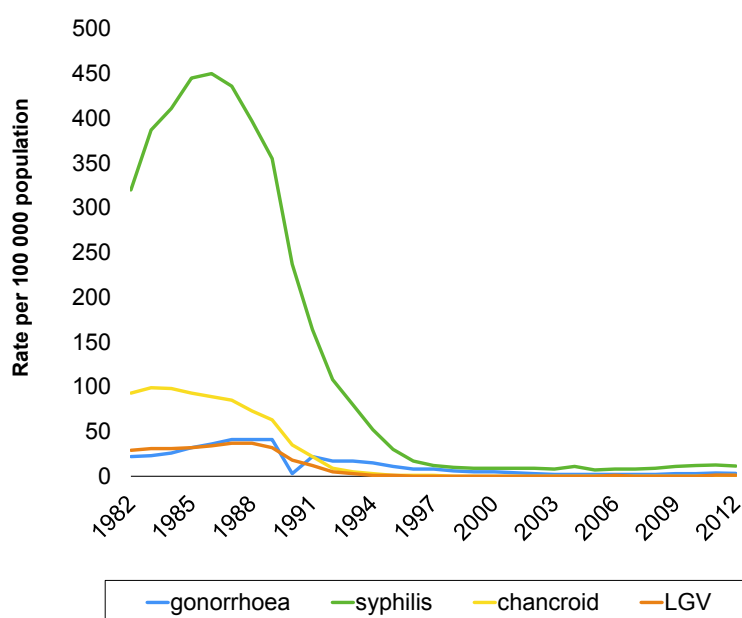
Thailand achieved a 95% reduction in incident case reports for five common, curable STIs following the launch of a package of STI services: the 100% condom use programme, STI screening and management in key affected populations (especially in sex workers), performance measurement and quality development in STI services (Figure 6.2). Two of these five common STIs, chancroid and LGV, meet criteria for elimination with near elimination of chancroid and LGV in recent years. HIV incidence and prevalence have also declined sharply. This has facilitated the achievement of MDG targets for universal access to HIV services and high coverage of dual elimination initiatives.

Implementation of the Thai programme was the responsibility of local STI clinic staff, who organized outreach and interventions to sex work venues in addition to providing clinical services. STI control efforts in Sri Lanka are organized around STI clinics at district hospitals and linked to strong primary health care services in communities, such that STI services include both clinic- and community-based activities.

These two examples illustrate what may be possible elsewhere. Other countries, including Cambodia and Cuba, have strong STI programmes with comparable strategies and show similar trends – from high condom use in sex work and strong programme implementation, to key outcomes of declining STI incidence and prevalence.

For example, Cuba has a strong STI control programme that monitors new STI cases from 452 polyclinics that provide personal, family and community-level prevention and case management services. Following evaluation of the STI programme in 2001, services were strengthened and the existing obligatory reporting of syphilis and gonorrhoea was expanded. Urethral and vaginal discharge syndromes and lower abdominal pain syndrome in women are now included, as are clinical diagnoses of chancroid, LGV, genital herpes and condyloma accuminata.

Figure 6.2 Incident case report rates for common STIs in Thailand, 1982–2012



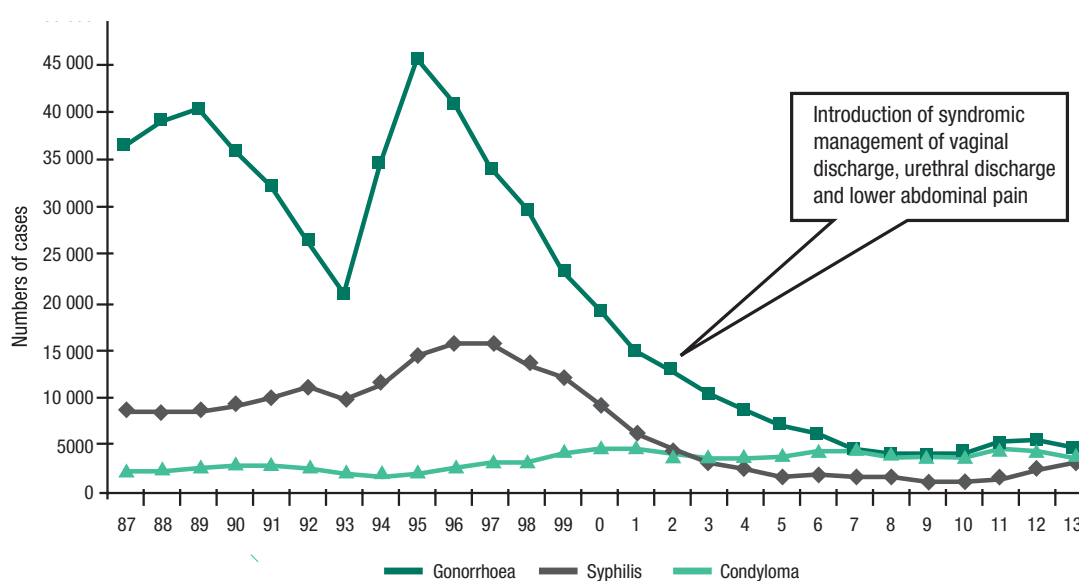
During the 1990s, the mean annual number of new syphilis and gonorrhoea cases reached 12 000 and 31 000 cases, respectively. Both STIs declined by approximately two thirds from the late 1990s (see Figure 6.3). In addition to providing reliable data for programme monitoring, STI reporting is used to facilitate and monitor partner notification and treatment. National-level data show a 94–97% partner notification rate for gonorrhoea during 2011–2013, with an average of 1.9 to 2.2 contacts per case notified and provided treatment and screening for other STIs.

WHO aims to support more countries to strengthen their STI control efforts so that they can replicate the results achieved in Cuba, Sri Lanka and Thailand. New guidance has been released on interventions with sex workers and MSM, and on reducing

mother-to-child transmission of syphilis and HIV (4, 5, 9). In addition to interventions themselves, WHO is taking steps to improve STI surveillance globally – including developing new guidelines and operational tools, and providing technical support – and has added several priority STI indicators to GARPR (see Sections 4 and 5).

The examples described here demonstrate that STI control is indeed feasible in a range of country settings, leading to lower morbidity and mortality, and to fewer STI sequelae and complications including adverse pregnancy outcomes and congenital infections. Improvements in STI surveillance should make it possible to document similar successes in other countries in the coming years.

Figure 6.3 Mandatory STI reporting in Cuba, 1987–2013



Annexes

Annex 1: Cascade of indicators for elimination of mother-to-child transmission of syphilis using most recent data reported through the Global AIDS Response Progress Reporting (GARPR) system, 2008–2012

All data for a given country (row) are highlighted in blue if the country has data for at least three of the four validation indicators that meet the global minimum criteria for validation of elimination of mother-to-child transmission (EMTCT) of syphilis.

Country	% of pregnant women with at least 1 ANC visit	Year	Indicator 1: % of ANC attendees tested for syphilis	Year	Indicator 2: % of ANC attendees tested who were positive for syphilis	Year	Indicator 3: % of ANC attendees positive for syphilis who received treatment	Year	Indicator 4: Congenital syphilis rate (cases per 100 000 live births)	Year
Africa										
Algeria	89.4	2006	–		1.9	2011	–		–	
Angola	67.6	2009	–		–		–		–	
Benin	85.8	2012	100.0	2011	0.1	2011	–		–	
Botswana	93.6	2007	–		1.3	2010	–		–	
Burkina Faso	94.9	2010	100.0	2011	1.9	2011	100.0	2010	–	
Burundi	98.9	2010	100.0	2010	0.8	2010	–		–	
Côte d'Ivoire	90.6	2012	92.1	2008	0.2	2010	–		–	
Cape Verde	94.9	2006	95.0	2012	1.0	2012	100.0	2012	–	
Cameroon	84.7	2011	–		0.6	2010	–		–	
Central African Republic	57.3	2006	82.6	2011	7.6	2011	97.8	2011	–	
Chad	42.6	2010	100.0	2012	4.7	2012	–		–	
Comoros	–		95.0	2008	0.0	2010	–		–	
Congo	92.6	2012	0.3	2012	–	–	–		–	
Democratic Republic of the Congo	88.8	2010	4.2	2011	3.3	2010	–		–	
Equatorial Guinea	91.0	2011	75.8	2012	6.8	2012	–		–	
Eritrea	–		0.0	2010	1.1	2008	–		–	
Ethiopia	33.9	2011	0.0	2010	2.2	2010	–		–	
Gabon	–		61.4	2012	2.2	2012	100.0	2012	–	
Gambia	96.9	2010	41.5	2012	–		–		–	
Ghana	86.7	2008	30.8	2008	1.5	2012	91.9	2012	–	
Guinea	88.4	2007	–		1.5	2009	–		–	
Guinea-Bissau	93.0	2010	0.4	2008	1.1	2010	–		–	
Kenya	91.5	2009	71.8	2012	1.3	2012	–		–	
Lesotho	91.8	2009	70.0	2012	2.9	2012	79.2		–	
Liberia	79.3	2007	10.9	2010	10.3	2012	–		–	
Madagascar	86.3	2009	37.7	2012	5.9	2012	64.6	2012	–	
Malawi	94.7	2010	23.0	2012	2.1	2012	100.0		–	
Mali	70.4	2006	4.8	2008	2.4	2010	–		–	
Mauritania	72.3	2007	4.9	2012	–		–		–	
Mauritius	–		100.0	2012	0.6	2012	100.0	2012	–	
Mozambique	90.6	2011	36.8	2012	6.4	2012	87.2	2012	–	
Namibia	94.6	2007	93.8	2010	1.9	2012	–		–	
Niger	46.1	2006	95.0	2011	2.6	2009	–		–	
Nigeria	52.9	2008	–		1.5	2005	–		–	
Rwanda	98.0	2010	72.3	2012	2.7	2011	–		–	
Sao Tome and Principe	97.5	2009	54.7	2012	1.6	2012	100.0	2012	–	
Senegal	93.3	2011	–				–		–	

Country	% of pregnant women with at least 1 ANC visit	Year	Indicator 1: % of ANC attendees tested for syphilis	Year	Indicator 2: % of ANC attendees tested who were positive for syphilis	Year	Indicator 3: % of ANC attendees positive for syphilis who received treatment	Year	Indicator 4: Congenital syphilis rate (cases per 100 000 live births)	Year
Seychelles	–		100.0	2012	0.0	2012	100.0	2012	–	
Sierra Leone	91.1	2010	0.0	2010	1.4	2010	–		–	
South Africa	–		74.5	2010	1.6	2011	–		–	
Swaziland	96.8	2010	34.8	2010	8.3	2010	–		–	
Togo	50.7	2010	4.6	2010	1.2	2011	–		–	
Uganda	94.9	2011	–		–		–		–	
United Republic of Tanzania	87.8	2010	44.9	2010	3.8	2010	100.0	2010	–	
Zambia	93.7	2007	27.6	2012	14.6	2012	100.0	2011	–	
Zimbabwe	89.8	2011	95.7	2012	1.9	2012	–		–	
Americas										
Antigua and Barbuda	100.0	2009	71.0	2012	0.2	2012	100.0	2012	–	
Argentina	91.4	2006	90.9	2011	1.1	2011	74.1	2011	109.6	2012
Bahamas	98.0	2008	91.6	2012	0.6	2012	100.0	2012	–	
Barbados	100.0	2008	99.5	2012	0.7	2012	100.0	2012		
Belize	99.3	2008	92.8	2012	0.5	2012	78.8	2012	–	
Bolivia (Plurinational State of)	85.8	2008	58.0	2012	1.3	2012	–		5.5	2012
Brazil	97.3	2010	88.2	2011	0.8	2011	83.0	2012	311.6	2012
Canada	100.0	2007	–		–		–		–	
Chile	–		–		–		100.0	2011	22.4	2012
Colombia	97.0	2010	73.6	2011	1.0	2011	89.4	2011	–	
Costa Rica	98.8	2010	87.0	2011	0.3	2010	73.3	2010	–	
Cuba	100.0	2009	100.0	2012	0.1	2012	100.0	2012		
Dominica	100.0	2009	100.0	2011	2.3	2011	–		–	
Dominican Republic	96.0	2010	13.7	2012	3.4	2012	–		–	
Ecuador	84.1	2007	67.8	2010	0.1	2010	–		–	
El Salvador	94.0	2008	89.6	2012	0.2	2012	12.3	2012	10.2	2012
Grenada	100.0	2009	100.0	2010	3.7	2010	–			
Guatemala	93.0	2009	50.9	2012	0.4	2012	100.0	2011	2.3	2012
Guyana	85.7	2009	85.0	2011	0.4	2011	–		–	
Haiti	84.5	2006	68.4	2010	3.9	2012	84.3	2012	–	
Honduras	83.9	2006	40.7	2012	0.1	2012	100.0	2012	–	
Jamaica	98.7	2009	82.5	2010	1.7	2010	–		–	
Mexico	95.8	2009	82.0	2011	0.2	2012	–		5.2	2012
Nicaragua	90.2	2007	70.9	2012	0.2	2012	98.5	2012	–	
Panama	95.9	2009	–		–		–		175.7	2012
Paraguay	96.1	2008	60.5	2012	2.1	2012	64.0	2012	–	
Peru	95.4	2011	78.5	2012	0.5	2012	72.8	2012	57.3	2012
Saint Kitts and Nevis	100.0	2007	–		–		–		–	
Saint Lucia	98.9	2008	44.6	2012	2.3	2011	33.3	2011	–	
Saint Vincent and the Grenadines	99.5	2008	–		0.7	2011	–		–	
Suriname	88.6	2006	–		–		–		–	
Trinidad and Tobago	95.3	2006	97.8	2009	0.1	2010	–		–	
Uruguay	96.2	2007	82.6	2012	1.5	2012	80.5	2012	151.6	
Venezuela (Bolivarian Republic of)	–		96.1	2010	1.9	2010	–		–	

Country	% of pregnant women with at least 1 ANC visit	Year	Indicator 1: % of ANC attendees tested for syphilis	Year	Indicator 2: % of ANC attendees tested who were positive for syphilis	Year	Indicator 3: % of ANC attendees positive for syphilis who received treatment	Year	Indicator 4: Congenital syphilis rate (cases per 100 000 live births)	Year
Eastern Mediterranean										
Afghanistan	45.5	2011	–		–		–		–	
Bahrain	100.0	2007	–		–		–		24.9	
Djibouti	81.0	2006	11.5	2010	8.1	2010	–		–	
Egypt	73.6	2008	–		–		–		–	
Iran (Islamic Republic of)	98.0	2005	0.0	2010	–		–		–	
Iraq	83.8	2006	27.3	2010	0.0	2010	–		–	
Jordan	98.8	2007	0.0	2010	0.0	2009	–		–	
Libya	93.1	2007	–		–		–		–	
Morocco	77.1	2011	–		0.9	2012	–		–	
Oman	99.4	2010	90.4	2012	0.0	2012	–		0.0	
Pakistan	64.0	2011	–		–		–		–	
Qatar	91.0	2012	–		–		–		–	
Saudi Arabia	98.0	2011	100.0	2008	0.1	2009	–		–	
Somalia	22.0	2006	8.5	2010	8.7	2011	–		–	
South Sudan	3.4	2010	3.4	2010	8.3	2012	–		–	
Sudan	3.4	2010	3.4	2010	2.2	2010	–		–	
Syrian Arab Republic	87.7	2009	–		–		–		–	
Tunisia	96.0	2006	–		–		–		–	
United Arab Emirates	100.0	2011	100.0	2011	0.1	2011	100.0	2011	1.5	
Yemen	47.0	2006	–		0.4	2010	–		–	
Europe										
Albania	97.3	2009	–		–		–		0.0	2010
Armenia	99.1	2010	89.2	2012	0.0	2012	–		–	
Azerbaijan	76.9	2006	100.0	2008	0.0	2008	–		0.1	2011
Belarus	99.4	2005	96.9	2012	0.0	2012	100.0	2012	0.0	2011
Bosnia and Herzegovina	98.9	2006	–		–		–		–	
Bulgaria	–		–		–		–		42.0	2012
Croatia	–		–		–		–		0.0	2012
Cyprus	99.2	2007	100.0	2011	0.0	2011	–		0.0	2012
Czech Republic	98.1	2010	100.0	2010	0.1	2010	100.0	2010	0.1	2012
Denmark	–		94.1	2010	0.0	2010	100.0	2010	0.0	2011
Estonia	94.5	2011	–		–		–		0.0	2012
France	100.0	2010	–		–		–		–	
Georgia	97.6	2010	86.1	2012	0.1	2012	–		0.2	2011
Germany	–		97.1	2008	0.2	2011	–		0.6	2012
Greece	–		–		–		–		0.0	2012
Hungary	–		100.0	2008	–		–		0.0	2012
Ireland	99.8	2010	–		–		–		0.0	2012
Italy	98.2	2009	–		–		–		0.0	2012
Kazakhstan	98.0	2006	100.0	2008	2.2	2008	–		–	
Kyrgyzstan	96.6	2006	88.8	2012	0.1	2012	100.0	2012	0.3	2010
Latvia	97.3	2010	–		–		–		5.0	2012
Lithuania	–		–		0.1	2012	–		3.3	2012
Luxembourg	–		–		–		–		0.0	2012

Country	% of pregnant women with at least 1 ANC visit	Year	Indicator 1: % of ANC attendees tested for syphilis	Year	Indicator 2: % of ANC attendees tested who were positive for syphilis	Year	Indicator 3: % of ANC attendees positive for syphilis who received treatment	Year	Indicator 4: Congenital syphilis rate (cases per 100 000 live births)	Year
Malta	–		100.0	2011	0.5	2011	–		0.0	2012
Montenegro	97.4	2005	–		–		–		–	
Netherlands	–		100.0	2007	0.1	2008	–		–	
Norway	–		–		–		–		0.0	2012
Poland	–		–		–		–		8.3	2012
Portugal	–		–		–		–		24.5	2012
Republic of Moldova	98.0	2005	100.0	2012	0.3	2012	100.0	2011	0.14	2011
Romania	–		30.1	2008	1.6	2009	–		–	
Serbia	98.9	2010	–		–		–		0.01	2011
Slovakia	–		100.0	2012	0.0	2012	98.7	2012	0.02	2011
Tajikistan	88.8	2007	57.7	2011	0.0	2011	100.0	2011	0.03	2010
The former Yugoslav Republic of Macedonia	94.0	2006	–		–		–		–	
Turkey	92.0	2008	–		–		–		–	
Turkmenistan	99.0	2006	–		–		–		–	
Ukraine	98.5	2007	92.4	2011	–		–		0.01	2011
United Kingdom	–		96.7	2010	0.2	2010	–		–	
Uzbekistan	98.7	2006	–		0.0	2009	–		–	
South-East Asia										
Bangladesh	49.8	2011	–		0.6	2010	–		–	
Bhutan	74.4	2010	97.3	2010	1.0	2010	–		–	
Democratic People's Republic of Korea	100.0	2009	0.3	2012	0.0	2012	–		–	
India	75.1	2008	69.2	2012	0.6	2012	89.0	2012	–	
Indonesia	93.3	2007	0.1	2012	1.2	2009	–		–	
Maldives	99.2	2009	37.4	2012	0.0	2012	–		–	
Myanmar	83.1	2010	11.8	2012	0.6	2012	85.8	2012	–	
Nepal	58.3	2011	–		–		–		–	
Sri Lanka	99.4	2007	96.0	2010	0.1	2012	97.8	2012	–	
Thailand	99.1	2009	91.6	2012	0.1	2012	93.1	2012	–	
Timor-Leste	84.4	2010	0.0	2010	–		–		–	
Western Pacific										
Australia	97.1	2009	–		–		–		–	
Brunei Darussalam	100.0	2011	100.0	2012	0.4	2012	–		–	
Cambodia	89.1	2010	49.3	2012	0.1	2012	98.5	2012	–	
China	94.1	2010	95.1	2012	0.2	2012	63.1	2012	–	
Cook Islands	100.0	2005	–		–		–		–	
Fiji	100.0	2005	100.0	2012	0.9	2012	–		–	
Kiribati	100.0	2005	100.0	2010	5.6	2009	–		–	
Lao People's Democratic Republic	71.0	2010	–		0.8	2009	–		–	
Malaysia	83.4	2010	99.5	2012	0.1	2012	100.0	2012	–	
Marshall Islands	81.2	2007	100.0	2012	4.7	2012	100.0	2012	–	
Mongolia	99.0	2010	97.1	2012	2.1	2012	89.3	2012	–	

Country	% of pregnant women with at least 1 ANC visit	Year	Indicator 1: % of ANC attendees tested for syphilis	Year	Indicator 2: % of ANC attendees tested who were positive for syphilis	Year	Indicator 3: % of ANC attendees positive for syphilis who received treatment	Year	Indicator 4: Congenital syphilis rate (cases per 100 000 live births)	Year
Nauru	94.1	2007	–		–		–		–	
Niue	100.0	2005	–		–		–		–	
Palau	90.3	2010	100.0	2012	1.6	2012	100.0	2012	–	
Papua New Guinea	64.7	2011	8.9	2011	6.7	2011	–		–	
Philippines	91.1	2008	–		0.1	2011	43.3	2011	–	
Republic of Korea	100.0	2009	–		–		–		–	
Samoa	93.0	2009	88.7	2012	0.0	2012	100.0	2011	–	
Singapore	100.0	2006	–		–		–		–	
Solomon Islands	73.9	2007	80.8	2012	6.2	2012	87.5		–	
Tonga	99.0	2010	–		–		–		–	
Tuvalu	93.3	2007	–		–		–		–	
Vanuatu	84.3	2007	46.4	2011	3.1	2011	–		–	
Viet Nam	93.7	2010	–		0.0	2012	–		–	

Sources: WHO Global Health Observatory Data Repository (<http://apps.who.int/gho/data/node.main.A1357STI>); GARPR 2013; Centralized Information System for Infectious Diseases (CISID; <http://data.euro.who.int/cisid/>); European Centre for Disease Prevention and Control (ECDC).

Annex 2: Syphilis prevalence reported for sex workers and men who have sex with men (MSM) using most recent data reported through the Global AIDS Response Progress Reporting (GARPR) system, 2008–2012

WHO Region	Sex workers		MSM	
Country	%	year	%	year
Africa				
Algeria	18.4	2008	0.3	2011
Angola	3.7	2010	–	–
Burundi	28.1	2008	–	–
Cameroon	17.5	2010	0.4	2011
Cape Verde	1.8	2012	–	–
Central African Republic	–	–	5.5	2011
Comoros	0.5	2010	–	–
Eritrea	1.3	2008	–	–
Gabon	2.1	2010	–	–
Ghana	6.3	2011	3.8	2011
Guinea-Bissau	19.6	2010	2.0	2010
Kenya	0.9	2011	0.7	2010
Madagascar	15.6	2010	5.4	2010
Mali	0.0	2010	–	–
Mauritius	4.4	2010	5.8	2010
Niger	2.3	2010	–	–
Nigeria	1.4	2008	0.0	2008
Sao Tome and Principe	4.7	2012	–	–
Senegal	3.4	2010	3.4	2008
Seychelles	–	–	0.0	2012
Uganda	20.4	2008	9.7	2008
United Republic of Tanzania	2.5	2010	–	–
Zimbabwe	12.3	2012	–	–
Americas				
Antigua and Barbuda	–	–	10.0	2012
Argentina	22.4	2010	20.1	2009
Bahamas	0.0	2010	44.1	2010
Belize	0.5	2012	0.0	2012
Bolivia (Plurinational State of)	5.2	2011	18.9	2011
Brazil	2.5	2010	13.4	2010
Chile	10.3	2011	–	–
Colombia	18.0	2008	3.3	2010
Costa Rica	12.9	2010	13.7	2010
Dominican Republic	9.0	2008	7.0	2008
Ecuador	–	–	6.5	2010
El Salvador	1.4	2012	5.3	2012
Guatemala	0.3	2012	2.2	2012
Guyana	15.4	2008	10.0	2008
Honduras	2.0	2012	5.6	2012
Jamaica	1.2	2010	15.0	2010
Mexico	3.5	2012	10.0	2012
Nicaragua	5.3	2010	2.0	2010
Panama	6.5	2012	30.4	2012
Paraguay	7.9	2012	13.4	2012
Trinidad and Tobago	10.8	2011	8.9	2011
Eastern Mediterranean				
Afghanistan	5.7	2012	18.8	2012
Iran (Islamic Republic of)	1.6	2008	–	–

WHO Region	Sex workers		MSM	
Country	%	year	%	year
Jordan	6.7	2008	1.8	2008
Morocco	17.7	2011	8.3	2011
Somalia	3.4	2008	–	–
Yemen	4.9	2008	–	–
Europe				
Armenia	4.0	2012	2.3	2012
Belarus	0.6	2011	1.1	2011
Belgium	1.0	2011	7.7	2010
Bosnia and Herzegovina	4.0	2011	0.6	2011
Bulgaria	9.6	2011	4.9	2011
Czech Republic	2.1	2010	9.6	2010
Estonia	0.9	2011	–	–
Georgia	23.8	2006	31.4	2006
Germany	2.3	2010	8.1	2010
Hungary	–	–	4.4	2010
Italy	–	–	9.1	2010
Kazakhstan	17.7	2008	4.1	2008
Kyrgyzstan	10.4	2010	5.7	2010
Latvia	–	–	1.6	2008
Lithuania	5.7	2008	1.9	2010
Netherlands	0.2	2010	2.3	2010
Republic of Moldova	8.9	2010	12.1	2010
Switzerland	–	–	7.0	2008
Tajikistan	9.6	2010	5.1	2011
The former Yugoslav Republic of Macedonia	1.1	2011	0.5	2011
Turkey	2.9	2010	–	–
Ukraine	4.4	2009	1.9	2010
United Kingdom	–	–	2.5	2010
Uzbekistan	5.4	2011	1.3	2011
South-East Asia				
Bangladesh	3.8	2011	1.5	2011
India	0.8	2012	0.8	2012
Indonesia	7.9	2012	21.9	2012
Maldives	0.0	2008	0.0	2008
Myanmar	3.8	2012	3.3	2012
Nepal	0.7	2011	1.5	2010
Sri Lanka	2.4	2011	11.7	2011
Thailand	0.5	2011	21.6	2008
Timor-Leste	9.8	2011	7.1	2011
Western Pacific				
Cambodia	0.9	2012	0.9	2012
China	2.6	2012	7.5	2012
Fiji	28.0	2012	26.5	2010
Lao People's Democratic Republic	0.5	2011	–	–
Malaysia	0.7	2012	0.0	2011
Mongolia	27.5	2012	4.1	2012
Papua New Guinea	21.1	2010	–	–
Philippines	1.3	2009	2.1	2010
Singapore	0.7	2010	18.4	2010
Viet Nam	0.7	2012	1.1	2012

Sources: GARPR 2013, unpublished data.

Annex 3: Pilot data on new STI indicators from two regions reported through the Global AIDS Response Progress Reporting (GARPR) system, 2012

Table A. Pilot data: syphilis among adults

WHO Region Country	Total rate per 100 000	Female rate per 100 000	Male rate per 100 000
Americas			
Argentina	22.1	–	–
Bolivia (Plurinational State of)	36.2	49.4	22.6
Chile	30.4	27.7	33.2
Uruguay	79.8	65.4	96.3
Nicaragua	0.0	–	–
Panama	50.4	49.2	51.6
Cuba	26.9	18.2	35.6
El Salvador	21.8	20.7	23.2
Guyana	12.9	21.8	3.9
Guatemala	5.6	–	–
Mexico	3.6	3.4	3.9
Saint Vincent and the Grenadines	109.6	107.3	116.7
	3.6	3.4	3.9
Eastern Mediterranean			
Afghanistan	4.2	0.7	7.4
Iran (Islamic Republic of)	0.1	0.2	0.0
United Arab Emirates	16.2	–	–
Somalia	10.2	–	–
Jordan	–	0.0	0.0
Oman	0.8	0.4	0.2
Bahrain	17.8	19.6	16.8
Jordan	–	0.0	0.0
Sudan	–		
Oman	0.8	0.4	0.2
Bahrain	17.8	19.6	16.8

Sources: GARPR 2013, unpublished data.

Table B. Pilot data: congenital syphilis

WHO Region Country	Rate per 100 000 live births
Americas	
Argentina	109.6
Brazil	311.6
Bolivia (Plurinational State of)	5.5
Chile	22.4
Uruguay	151.6
Panama	175.7
Peru	57.3
El Salvador	10.2
Guatemala	2.3
Mexico	5.2
Eastern Mediterranean	
Oman	0.0
United Arab Emirates	1.5
Bahrain	24.9

Table C. Pilot data: male gonorrhoea and urethral discharge rates

WHO Region Country	Male gonorrhoea rate per 100 000	Urethral discharge rate per 100 000
Americas		
Bolivia (Plurinational State of)	28.5	—
Chile	18.3	—
Cuba	74.4	45.2
El Salvador	20.4	23.5
Guatemala	—	46.5
Guyana	—	221.9
Mexico	1.2	—
Panama	55.3	32.2
Peru	—	133.0
Saint Vincent and the Grenadines	23.8	—
Eastern Mediterranean		
Bahrain	12.7	28.0
Iran (Islamic Republic of)	2.3	27.5
Jordan	—	100.2
Morocco	366.5	583.6
Oman	5.0	12.6
Sudan	—	51.0
United Arab Emirates	2.1	0.1

Sources: GARPR 2013, unpublished data.

Table D. Pilot data: genital ulcer disease

WHO Region Country	Male rate per 100 000	Female rate per 100 000
Americas		
Bolivia (Plurinational State of)	74.9	44.1
Panama	8.3	19.1
Guyana	30.8	104.9
Mexico	7.5	7.9
Eastern Mediterranean		
Morocco	49.6	71.4
Jordan	0.0	91.1
Sudan	3.4	4.4
Bahrain	2.8	2.9

Sources: GARPR 2013, unpublished data.

Annex 4: Data collected through WHO Gonococcal Antimicrobial Surveillance Programme (GASP), 2010–2011

WHO region Country	Ceftriaxone/Cefixime				Azithromycin				Quinolones/Ciprofloxacin			
	2010		2011		2010		2011		2010		2011	
	# of isolates	%	# of isolates	%	# of isolates	%	# of isolates	%	# of isolates	%	# of isolates	%
Africa												
Côte d'Ivoire	12	0.0	9	0.0	–	–	–	–	12	68.7	–	–
Ethiopia	11	0.0	–	–	–	–	–	–	11	18.0	–	–
Kenya	154	0.0	–	–	108	0.0	–	–	–	–	–	–
South Africa	175	0.0	146	1.4	–	–	–	–	154	53.2	17	71.0
Uganda	–	0.3	151	0.0	–	–	–	–	–	–	9	88.0
Zimbabwe	169	2.9	–	–	–	–	–	–	69	5.8	–	–
Americas												
Argentina	316	0.0	351	0.0	–	–	–	–	316	26.9	351	47.9
Brazil	–	–	–	–	–	–	–	–	–	–	–	–
Chile	508	0.0	743	0.0	189	0.5	743	5.0	538	30.1	743	31.0
Colombia	–	–	–	–	–	–	–	–	24	0.0	41	34.2
Cuba	–	–	33	0.0	–	–	–	–	–	–	33	48.5
Ecuador	6	0.0	–	–	–	–	–	–	6	83.3	–	–
El Salvador	14	0.0	–	–	–	–	–	–	14	0.0	–	–
Panama	1	0.0	–	–	–	–	–	–	1	0.0	–	–
Paraguay	13	0.0	24	0.0	–	–	–	–	13	30.7	12	58.3
Venezuela (Bolivarian Republic of)	14	0.0	6	0.0	–	–	–	–	14	21.4	6	0.0
Regional sub-total (excluding Canada and the United States of America)	872		1157		189		743		926		1186	
Canada	–	7.3	–	–	–	–	–	–	–	–	–	–
United States of America	5693	0.3	5467	0.4	5693	0.5	5467	0.3	5693	12.5	5467	13.3
Overall regional total	7437		7781		6071		6953		7545		7839	
Europe												
Austria	110	22.7	106	13.2	110	10.0	106	12.3	110	61.8	106	67.9
Belgium	110	3.6	110	0.9	110	2.7	110	3.6	110	60.0	110	55.5
Cyprus	12	50.0	10	10.0	12	0.0	10	10.0	12	100.0	10	80.0
Denmark	96	20.8	125	20.0	96	16.7	125	73.0	96	68.8	125	58.4

WHO region Country	Ceftriaxone/Cefixime				Azithromycin				Quinolones/Ciprofloxacin			
	2010		2011		2010		2011		2010		2011	
	# of isolates	%	# of isolates	%	# of isolates	%	# of isolates	%	# of isolates	%	# of isolates	%
Western Pacific												
Australia	3220	2.0	3647	3.6	–	< 1.0	3647	1.3	3997	34.7	3647	31.0
Australia (Remote)	–	–	459	0.4	–	–	459	0.2	–	–	459	3.5
Brunei	389	0.3	295	1.0	–	–	295	–	396	93.2	295	89.0
Cambodia	6	0.0	–	–	–	0.0	–	–	75	8.0	–	–
China	1026	36.9	1349	21.0	–	–	1349	–	1026	125.5	1349	99.0
Fiji	541	0.4	17	0.0	–	–	17	–	336	0.6	252	0.0
Hong Kong, Special Administrative Region, China	1366	0.0	1225	1.6	–	–	1225	3.9	947	98.6	1225	99.0
Japan	263	0.0	441	4.8	–	–	441	–	403	73.2	441	75.0
Korea	61	47.5	64	25.0	–	–	64	–	82	95.1	64	89.0
Malaysia	10	10.0	–	–	–	–	–	–	17	88.2	–	–
Mongolia	150	30.7	–	–	–	–	–	–	690	34.5	–	–
New Caledonia	81	0.0	166	–	–	–	166	–	197	0.5	166	6.0
New Zealand	234	0.0	317	3.2	–	–	317	–	72	29.2	317	45.0
Papua New Guinea	40	0.0	–	–	–	–	–	–	–	–	–	–
Philippines	160	0.0	34	0.0	–	–	34	–	59	96.6	34	94.0
Singapore	80	0.0	160	6.9	–	–	160	–	160	74.4	160	84.0
Tonga	4	25.0	–	–	–	–	–	–	–	–	–	–
Viet Nam	54	0.0	75	1.3	–	0.0	75	1.3	86	100.0	75	96.0
Regional total	7685		8249		–		8249		8543		8484	

Source: Compiled using data from the WHO Global Health Observatory Data Repository (<http://apps.who.int/gho/data/node.main.A1357STI?lang=en>).

Annex 5: Data sources, analysis and interpretation

Data sources

This global STI baseline report includes STI surveillance data collected by several different methods. Data on syphilis in pregnant women, in men who have sex with men, and in sex workers were collected through the WHO HIV Universal Access Reporting system and the Global AIDS Response Progress Reporting (GARPR) system, now merged and jointly called GARPR. GARPR is the annual effort coordinated by the Joint United Nations Programme on HIV/AIDS (UNAIDS), the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) to collect surveillance data and assess the status of universal access to critical HIV services (17).

The Gonococcal Antimicrobial Surveillance Programme (GASP) obtains data through reporting by regional reference laboratories to WHO as well as from published sources in Europe, Asia and the Pacific, and the Americas.

Data for other STI indicators – gonorrhoea, syphilis in adults, urethral discharge, and genital ulcer disease – have not been routinely collected at the global level. However, these indicators were piloted in two regions for 2012 and were incorporated in GARPR for all regions beginning with 2013 data.

Additional data on congenital syphilis case rates came from the WHO European Region online reporting system (the Centralized Information System for Infectious Diseases (CISID)), as well as the European Centre for Disease Prevention and Control (ECDC).¹ The WHO Regional Office for the Americas also collects congenital syphilis data. These data were used for this analysis, although they are currently available only upon request.

Data analysis and conventions

Case report data were collated, and standardized rates calculated. The country case rate is an incidence measure defined as the number of new cases of each syndrome or confirmed etiology divided by the country's sex-specific population

aged 15 years and older (presented as a rate per 100 000). For example:

Urethral discharge rate (cases per 100 000 male adults) = $(100\,000 \times \text{the number of cases of urethral discharge among males}) / (\text{the number of males} \geq 15 \text{ years})$

Case numbers came from country reports, while denominator data for calculation of rates for gonorrhoea, syphilis in adults, urethral discharge and genital ulcer disease came from demographic data files published by the United Nations Department of Economic and Social Affairs (18). Case rates for congenital syphilis were based on the total number of live births and were not disaggregated by sex. Estimates of live births came from the WHO Global Health Observatory Data Repository² for all countries except those in the WHO European Region, where live birth estimates came from the WHO European Region Health for All database.⁸

In this report, data tables are generally organized by WHO region (19) and then alphabetically by country name. Data in Table 1.1 are also analysed by grouping countries by income status, using World Bank classifications (20). To aid interpretation, the source of data is described when available, e.g. whether GARPR data come from routine programme sources or from special studies or surveys. Regional teams have reviewed all the data presented in this report.

Interpretation of case reports

Interpreting how case reporting rates reflect the epidemiology of STIs in the general population is challenging for several reasons. Case rates depend heavily on norms of health-care seeking behaviour among individuals infected with STIs, as well as screening practices and the availability of syndromic or etiologic-based diagnostic services in each country. Case definitions may vary; for example, some countries may not include stillbirths in their case definition for congenital syphilis. Differences in resources for, policies on, and enforcement of STI

1 Available at: <http://data.euro.who.int/cisid/>

2 Available at: <http://apps.who.int/gho/data/node.main>

case reporting can also greatly affect the proportion of infections reported. Case reporting in many countries may be limited to public-sector facilities or to facilities at a specific level of capacity (e.g. district hospitals).

Due to such factors influencing the completeness of reporting, care must be taken when comparing case rates between countries. For the most part, case rates may give an indication of the minimum possible level of STIs in a population. The general assumption is that even relatively strong case reporting systems in resource-rich countries face significant underreporting (10). Within a country, when the system for STI clinical management is stable (i.e. no significant change in diagnostic or screening protocols and no change in reporting practices), trends in case reports can indicate a trend in STI infections among the general population. However, even trends within a country should be viewed with caution. For example, if a new HIV and/or STI prevention programme is initiated to encourage regular reproductive health check-ups or to increase use of services, case rates may appear to be increasing when, in fact, they are not.

References

1. *Global strategy for the prevention and control of sexually transmitted infections: 2006–2015: breaking the chain of transmission*. Geneva: World Health Organization; 2007 (<http://www.who.int/reproductivehealth/publications/rtis/9789241563475/en/>, accessed 15 May 2014).
2. *Baseline report on global sexually transmitted infection surveillance 2012*. Geneva: World Health Organization; 2013 (<http://www.who.int/reproductivehealth/publications/rtis/9789241505895/en/>, accessed 15 May 2014).
3. *Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO) Working Group on HIV/AIDS and STI Surveillance. Strategies and laboratory methods for strengthening surveillance of sexually transmitted infections 2012*. Geneva: WHO; 2012 (http://apps.who.int/iris/bitstream/10665/75729/1/9789241504478_eng.pdf, accessed 26 May 2014).
4. *Prevention and treatment of HIV and other sexually transmitted infections for sex workers in low- and middle-income countries: recommendations for a public health approach*. Geneva: World Health Organization; 2013 (http://www.who.int/hiv/pub/guidelines/sex_worker/en/, accessed 15 May 2014).
5. *Prevention and treatment of HIV and other sexually transmitted infections among men who have sex with men and transgender people: recommendations for a public health approach 2011*. Geneva: World Health Organization; 2011 (http://www.who.int/hiv/pub/guidelines/msm_guidelines2011/en/, accessed 15 May 2014).
6. *UNAIDS/WHO Working Group on Global HIV/AIDS and STI surveillance. Surveillance of the HIV/AIDS epidemic: a comprehensive package*. Geneva: World Health Organization; 2013 (<http://www.who.int/hiv/pub/surveillance/2013package/en/>, accessed 15 May 2014).
7. Gottlieb SL, Low N, Newman LM, Bolan G, Kamb M, Broutet N. Toward global prevention of sexually transmitted infections (STIs): the need for STI vaccines. *Vaccine*. 2014;32:1527–35. doi:10.1016/j.vaccine.2013.07.087.
8. Broutet N, Fruth U, Deal B, Gottlieb SL, Rees H. Vaccines against sexually transmitted infections: the way forward. *Vaccine*. 2014;32:1630–7. doi:10.1016/j.vaccine.2014.01.053.
9. *Global guidance on criteria and processes for validation of elimination of mother-to-child transmission (EMTCT) of HIV and syphilis*. Geneva: World Health Organization; 2014 (<http://www.who.int/reproductivehealth/publications/rtis/9789241505888/en/>, accessed June 2014).
10. Newman L, Kamb M, Hawkes S, Gomez G, Say L, Seuc A, Broutet N. Global estimates of syphilis in pregnancy and associated adverse outcomes: analysis of multinational antenatal surveillance data. *PloS Medicine*. 2013. doi:10.1371/journal.pmed.1001396.
11. *Global incidence and prevalence of selected curable sexually transmitted infections – 2008*. Geneva: World Health Organization; 2012 (<http://www.who.int/reproductivehealth/publications/rtis/stisestimates/en/>, accessed 15 May 2014).
12. Feng TJ (ed). *Epidemiology of sexually transmitted diseases and the factors related to the epidemic in Shenzhen*. Beijing: People's Health Publishing House; 2012.
13. Qin JB, Feng TJ, Yang TB, Hong FC, Lan LN, Zhang CL, et al. Risk factors for congenital syphilis and adverse pregnancy outcomes in offspring of women with syphilis in Shenzhen, China: a prospective nested case-control study. *Sex Transm Dis*. 2014;41(1):13–23.
14. Steen, R, Zhao P, Wi TE, Punchihewa N, Abeyewickreme I, Lo Y-R. Halting and reversing HIV epidemics in Asia by interrupting transmission in sex work: experience and outcomes from ten countries. *Expert Rev Anti Infect Ther*. 2013;11(10):999–1015. doi:10.1586/14787210.2013.824717.
15. *Strengthening of STI surveillance in the Republic of Moldova: report on a mission 11–15 March 2013*. Copenhagen: World Health Organization, Regional Office for Europe; 2013 (http://www.euro.who.int/__data/assets/pdf_file/0011/195482/Moldova-STI-surveillance-report.pdf, accessed 15 May 2014).
16. Starnino S, Galarza P, Carvallo ME, Benzaken AS, Ballesteros AM, Cruz OM, et al.; GASP-LAC Working Group. Retrospective analysis of antimicrobial susceptibility trends (2000–2009) in *Neisseria gonorrhoeae* isolates from countries in Latin America and the Caribbean shows evolving resistance to ciprofloxacin, azithromycin and decreased susceptibility to ceftriaxone. *Sex Transm Dis*. 2012;39(10):813–21 (<http://www.ncbi.nlm.nih.gov/pubmed/23001269>, accessed 26 May 2014).

17. *World Health Organization, Joint United Nations Programme on HIV/AIDS (UNAIDS), United Nations Children's Fund. Global AIDS response progress reporting 2014: construction of core indicators for monitoring the 2011 United Nations political declaration on HIV and AIDS.* Geneva: UNAIDS; 2014 (http://www.unaids.org/en/media/unaids/contentassets/documents/document/2014/GARPR_2014_guidelines_en.pdf, accessed 15 May 2014).
18. *World population prospects: the 2012 revision.* New York (NY): United Nations Department of Economic and Social Affairs; 2010 (<http://esa.un.org/unpd/wpp/index.htm>, accessed 15 May 2014).
19. *About WHO: WHO – its people and offices [website].* Geneva: World Health Organization; 2013 (<http://www.who.int/about/structure/en/index.html>, accessed 15 May 2014).
20. *Data: how we classify countries [website].* Washington (DC): The World Bank; 2014 (<http://data.worldbank.org/about/country-classifications>, accessed 15 May 2014).

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