



SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Syphilis

Key facts

- In 2016, 29 365 syphilis cases were reported in 28 EU/EEA Member States; the incidence rate for 2016 was 6.1 cases per 100 000 population.
- Reported syphilis rates were eight times higher in men than in women and peaked among 25–34-year-old men (25 cases per 100 000 population).
- Two-thirds (66%) of the syphilis cases with information on transmission category were reported in men who have sex with men (MSM).
- The trend in syphilis rates has been on the rise since 2011, particularly among men, mainly due to an increase in the number of cases among MSM.
- Rates among women increased slightly in 2016.

Methods

This report is based on data for 2016 retrieved from The European Surveillance System (TESSy) on 22 January 2018. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases.

For a detailed description of methods used to produce this report, please refer to the *Methods* chapter [1].

An overview of the national surveillance systems is available online [2].

A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [3].

This surveillance report is based on syphilis surveillance data collected by the European Sexually Transmitted Infections Surveillance Network for 2016. Thirty EU/EEA Member States (28 EU Member States plus Iceland and Norway) participate in this network.

In 2016, the majority of countries (19) reported data using the standard EU case definitions [4]. Five countries reported using national case definitions, and four countries did not state which case definition was in use. Most countries (24) have comprehensive surveillance systems. Four have sentinel systems that only capture syphilis diagnoses from a selection of healthcare providers. Reporting of syphilis infection is compulsory in 24 countries,

Suggested citation: European Centre for Disease Prevention and Control. Syphilis. In: ECDC. Annual epidemiological report for 2016. Stockholm: ECDC; 2018.

Stockholm, July 2018

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voluntary in three (all with sentinel systems); syphilis reporting requirements in the United Kingdom are categorised as 'other'.

In the analysis below, data from sentinel systems were not used in the calculation of national or overall rates because population coverage was not always known and denominators were therefore not available. Cases are analysed by date of diagnosis. All reported cases of syphilis are included in the analysis below, which might for some countries also include cases of non-infectious syphilis. It was not possible to exclude cases of late latent syphilis for some countries because they did not provide information on infection stages.

Epidemiology

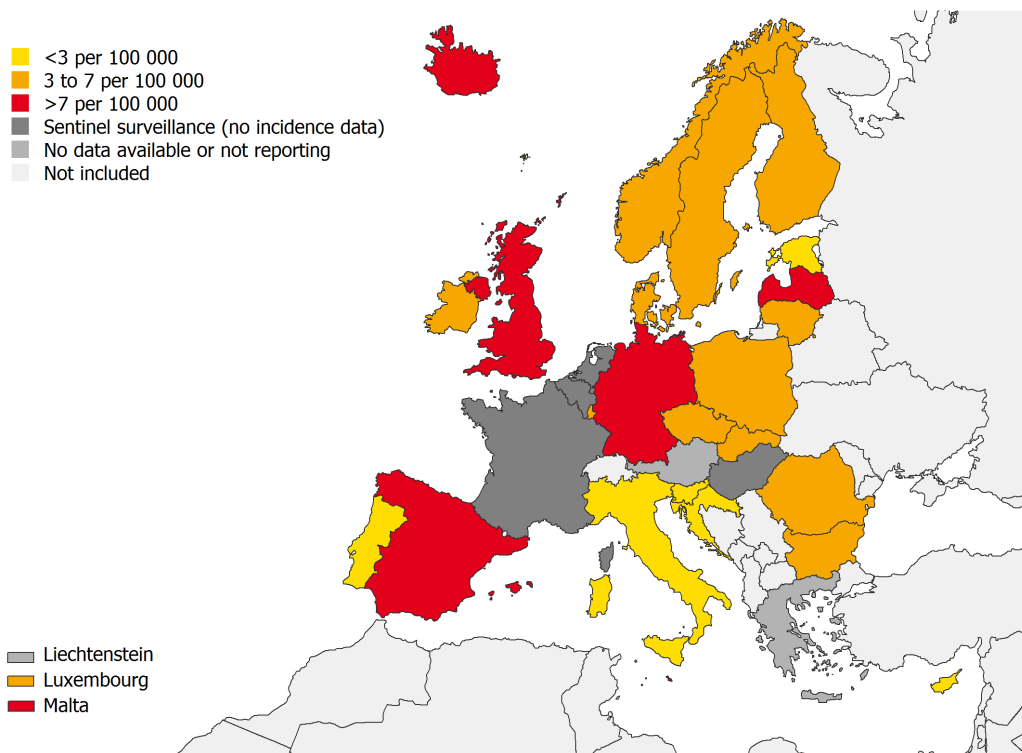
Geographic distribution

In 2016, 29 365 confirmed syphilis cases were reported in 28 countries, giving a crude notification rate of 6.1 cases per 100 000 population (Table 1) for countries with comprehensive surveillance systems. The highest rate was observed in the United Kingdom (9.9 cases per 100 000 population), followed by Malta (9.2), Iceland (9.0) and Germany (8.7). Rates below 2 cases per 100 000 population were observed in Croatia, Cyprus, Estonia, Portugal and Slovenia (Figure 1).

Table 1. Distribution of confirmed cases of syphilis, EU/EEA, 2012–2016

Country	2012		2013		2014		2015		National coverage	Reported cases	2016		
	Confirmed cases		Confirmed cases		Confirmed cases		Confirmed cases				Number	Rate	ASR
	Number	Rate	Number	Rate	Number	Rate	Number	Rate					
Austria	78	-	538	-	-	-	-	-	-	-	-	-	-
Belgium	658	-	867	-	872	-	892	-	N	1531	1531	-	-
Bulgaria	309	4.2	354	4.9	460	6.3	465	6.5	Y	367	367	5.1	-
Croatia	28	0.7	80	1.9	51	1.2	25	0.6	Y	29	27	0.6	0.7
Cyprus	6	0.7	12	1.4	18	2.1	31	3.7	Y	16	16	1.9	1.8
Czech Republic	329	3.1	402	3.8	408	3.9	554	5.3	Y	538	538	5.1	5.1
Denmark	343	6.1	317	5.7	361	6.4	777	13.7	Y	365	365	6.4	6.9
Estonia	40	3.0	39	3.0	35	2.7	25	1.9	Y	25	25	1.9	2.0
Finland	201	3.7	153	2.8	196	3.6	243	4.4	Y	230	211	3.8	4.1
France	865	-	1014	-	1405	-	1755	-	N	1742	1742	-	-
Germany	4414	5.5	5324	6.6	5821	7.2	6688	8.2	Y	7175	7175	8.7	9.2
Greece	363	-	300	-	247	-	320	-	-	-	-	-	-
Hungary	621	-	627	-	622	-	617	-	N	712	712	-	-
Iceland	5	1.6	3	0.9	25	7.7	23	7.0	Y	30	30	9.0	9.7
Ireland	110	2.4	163	3.6	204	4.4	276	6.0	Y	291	291	6.2	6.3
Italy	1138	1.9	1170	2.0	1151	1.9	1060	1.7	Y	1424	1420	2.3	2.3
Latvia	148	7.2	127	6.3	139	6.9	141	7.1	Y	159	159	8.1	8.3
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	227	7.6	269	9.1	257	8.7	130	4.5	Y	151	151	5.2	5.4
Luxembourg	20	3.8	27	5.0	27	4.9	21	3.7	Y	27	27	4.7	4.8
Malta	35	8.4	45	10.7	49	11.5	41	9.5	Y	40	40	9.2	8.9
Netherlands	649	-	743	-	975	-	1221	-	N	1515	1515	-	-
Norway	109	2.2	185	3.7	189	3.7	172	3.3	Y	188	188	3.6	3.8
Poland	961	2.5	1324	3.5	1147	3.0	1239	3.3	Y	1291	1291	3.4	-
Portugal	235	2.2	155	1.5	101	1.0	43	0.4	Y	705	60	0.6	0.6
Romania	1717	8.5	1393	7.0	1267	6.4	969	4.9	Y	928	928	4.7	4.7
Slovakia	412	7.6	337	6.2	369	6.8	295	5.4	Y	349	349	6.4	6.3
Slovenia	63	3.1	35	1.7	23	1.1	43	2.1	Y	35	35	1.7	1.6
Spain	3641	7.8	3723	8.0	3568	7.7	3756	8.1	Y	3356	3356	7.2	-
Sweden	197	2.1	275	2.9	244	2.5	325	3.3	Y	346	346	3.5	3.9
United Kingdom	3347	5.3	3631	5.7	4740	7.4	5768	8.9	Y	6470	6470	9.9	10.2
EU/EEA	21269	4.7	23632	5.0	24971	5.4	27915	5.9	.	30035	29365	6.1	6.5

ASR: age-standardised rate; - = rate not calculated because country has a sentinel surveillance system

Figure 1. Distribution of confirmed syphilis cases per 100 000 population by country, EU/EEA, 2016

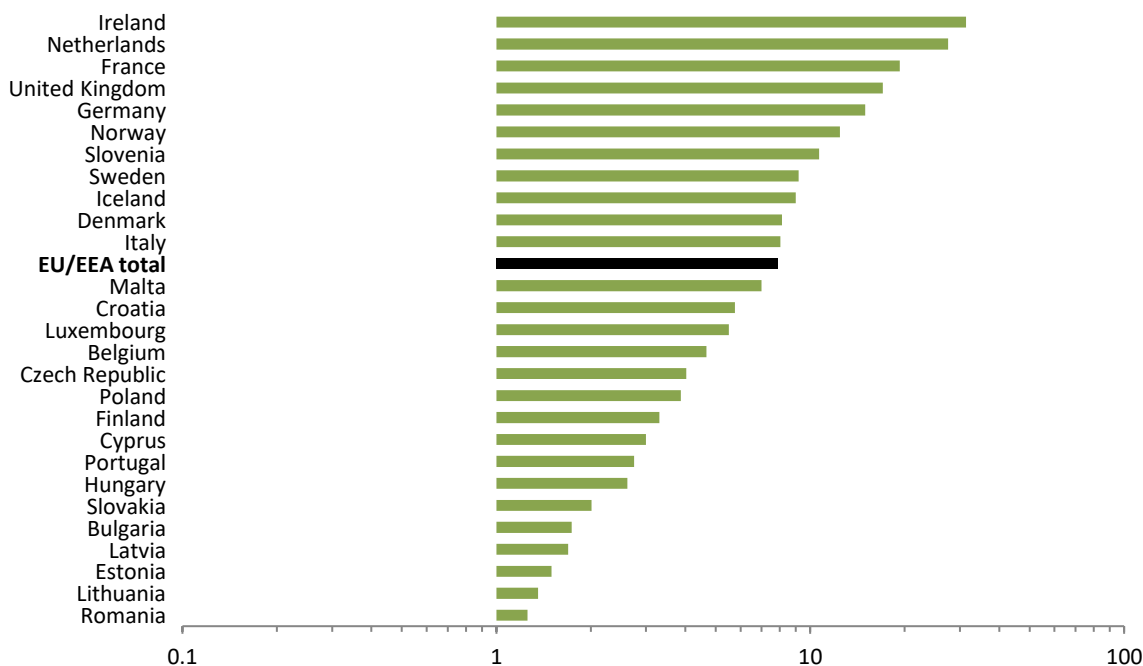
Source: Country reports from Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Gender

The male-to-female ratio in 2016 was 7.9:1, with rates of 10.8 cases per 100 000 population in men (23 042 cases) and 1.3 cases per 100 000 population in women (2 919 cases). The highest rates among men (above 15 cases per 100 000 population) were observed in Germany, Iceland, Malta and the United Kingdom. Rates among women were highest (above 3 cases per 100 000 population) in Bulgaria, Latvia, Lithuania, Romania and Slovakia. There were marked differences in the male-to-female ratios across countries: ratios above 10:1 were reported by France, Germany, Ireland, Netherlands, Norway, Slovenia and the United Kingdom, while five countries reported male-to-female ratios below 2:1 (Bulgaria, Estonia, Latvia, Lithuania and Romania). The male-to-female ratio has been increasing continuously, from 1.4:1 in 2000 to a maximum of 8.0:1 in 2015 before decreasing slightly to 7.9:1 in 2016.

When compared to 2015, rates have increased among both genders. Rates among men have increased by 5.6% in 2016, continuing the previously observed trend. Rates among women have also increased in 2016 compared with 2015 (by 3.5%). They have increased in the majority of EU/EEA countries when compared with 2015, with increases mostly – although not exclusively – in countries in central and eastern Europe.

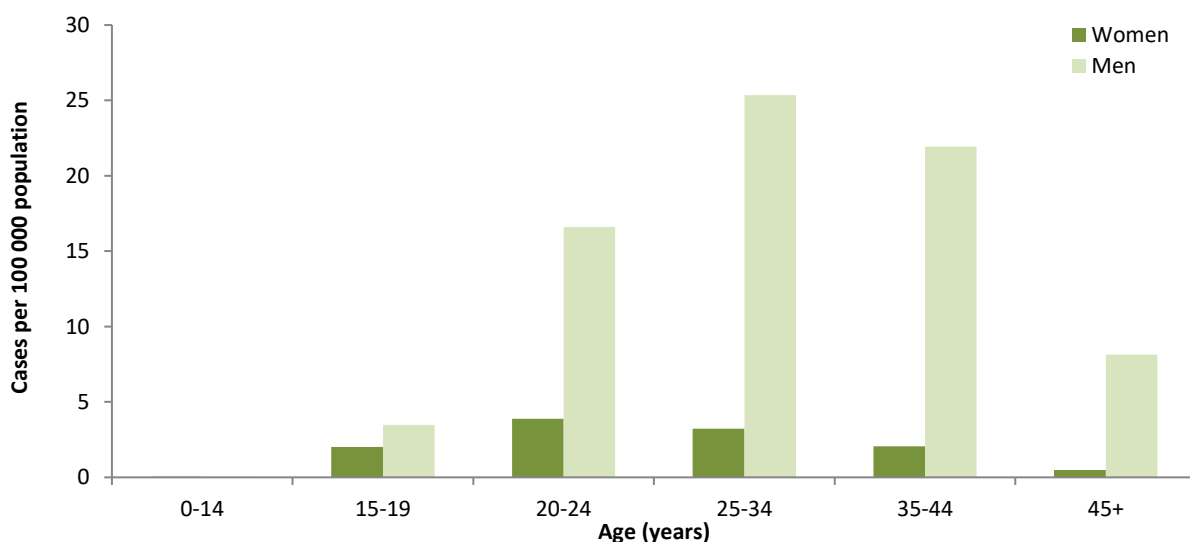
Figure 2. Syphilis, male-to-female ratio in 27 EU/EEA countries, 2016



Age

Information on age was available for 24 countries in 2016. It was not available, or was reported in a format not suitable for analysis, for Belgium, Bulgaria, Poland and Spain; these four countries together accounted for 22% of all cases. In 2016, the largest proportion of cases was reported in the age group above 45 years (31%). However, almost equally large proportions of cases were reported in the age groups 25–34 years (30%) and 35–44 years (26%). Young adults aged 15–24 years accounted for 13% of all reported cases. Age-specific rates were highest among 25–34 year-olds (14 per 100 000), but were also high among 35–44 year-olds (12) and 20–24 year-olds (10) (Figure 3). Age and gender-specific rates were higher among men in all age groups. The highest age and gender-specific rates were observed among men aged 25–34 years (25 cases per 100 000 population).

Figure 3. Distribution of confirmed syphilis cases per 100 000 population, by age and gender, EU/EEA, 2016



Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Finland, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

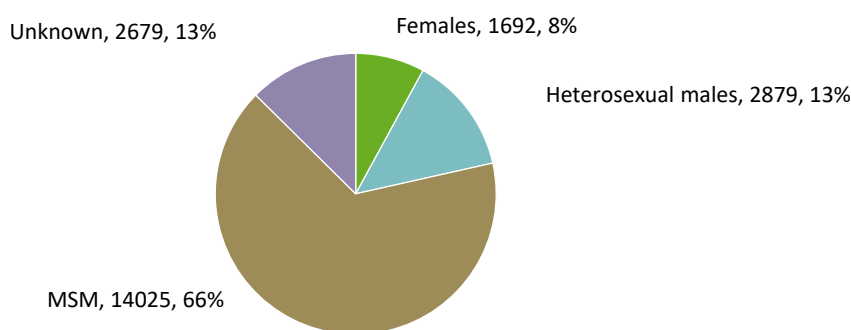
Transmission, HIV status and syphilis stage

In 2016, 18 countries reported information on transmission category for more than 60% of their cases. These 18 countries accounted for 72% (n=21 275) of all reported syphilis cases. Among these cases, transmission category was indicated as MSM in 66%, heterosexual in 21% (males: 13%; females: 8%) and unknown in 13% (Figure 4). The percentage of cases diagnosed in MSM ranged from below 30% in Finland, Hungary, Latvia, Lithuania, Romania and Slovakia to more than 70% in France, Ireland, the Netherlands, Norway, Sweden and the United Kingdom.

In 2016, HIV co-infection status was reported by 17 countries, which accounted for 46% of syphilis cases (n=13 595). Of these, 27% were HIV-positive (either known or newly diagnosed) and 53% were HIV-negative. The HIV status was unknown for 20%. Among cases for whom the HIV status was known, 34% were HIV-positive. In MSM with known HIV status, 41% were HIV positive.

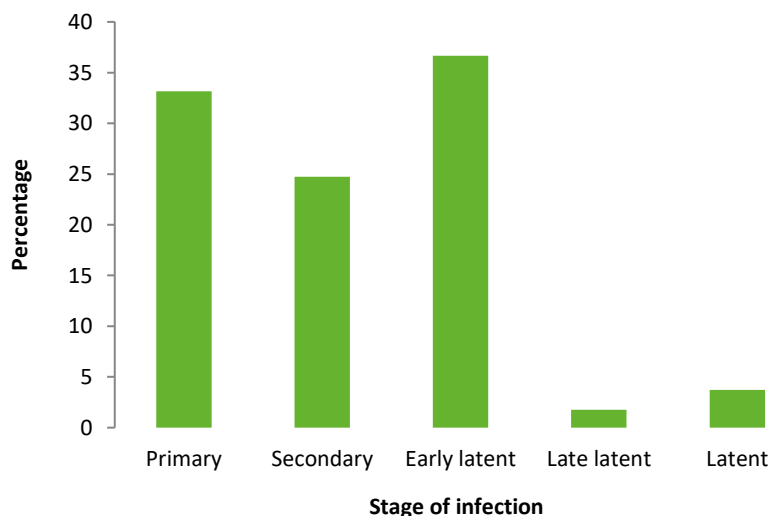
Details on the clinical stage of syphilis infection were provided by 18 countries for 46% of all reported cases in 2016. The majority of cases were reported as 'primary' (33%), 'secondary' (25%) or 'early latent' infection (37%) (Figure 5), while some cases were reported as 'late latent' (1.8%) or 'latent' syphilis infection (i.e. the duration of the infection was unknown) (3.7%). The distribution across countries varied: Ireland, Malta, Norway, Portugal, Slovenia, Sweden and the United Kingdom reported the largest proportion of their cases as primary syphilis; Estonia, Luxembourg and Slovakia reported the largest proportion of cases as secondary syphilis, whereas the Czech Republic, France, Hungary, Latvia, the Netherlands, and Romania reported the largest proportions as early latent. Lithuania reported the largest proportion of cases as latent syphilis.

Figure 4. Percentage of syphilis infections by transmission category and gender (n=21 275), EU/EEA, 2016



Source: Country reports from the Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 5. Distribution of reported syphilis infection stages, EU/EEA, 2016



Source: Country reports from the Czech Republic, Estonia, France, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Trends 2007–2016

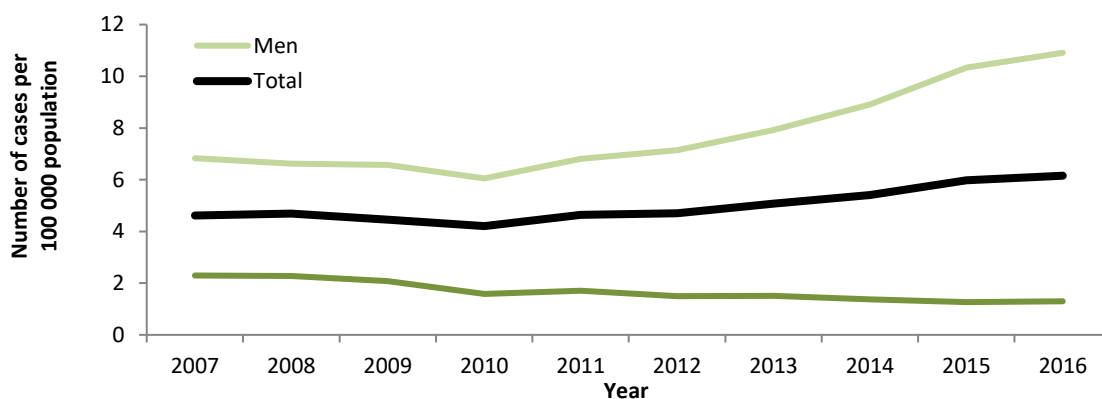
Between 2007 and 2016, a total of 226 583 cases of syphilis were reported in 30 countries. During this period, 28 countries consistently reported data. In addition, Austria reported data until 2013, and Croatia reported data from 2012 onwards following accession to the European Union. Among the countries reporting consistently between 2007 and 2016, the trend of reported syphilis infections per 100 000 population was stable between 2007 and 2010 (Figure 6). Since 2010, however, the overall trend has been increasing. Diverging trends can be observed between genders, with a marked increase among men and a slow decrease among women.

Between 2010 and 2016, many countries, particularly in western Europe, observed a sharp increase in the number of reported syphilis infections, with increases of between 50 and 100% in Malta, Norway and Sweden. Cases more than doubled in Belgium, Denmark, France, Germany, Iceland, Ireland, Luxembourg, the Netherlands and the United Kingdom.

In the past ten years, the proportion of cases among age groups below 45 years decreased, while the proportion of persons aged 45 years and over increased from 21% to 31%. Up until 2010, age-specific rates decreased or were stable among persons below 25 years of age and increased by 14% among those aged 45 years or over. Since 2010, rates have continued decreasing among persons below 20 years of age but have increased among older persons (20–24: +27%, 25–34: +58%, 35–44: +68%, 45 and over: +95%).

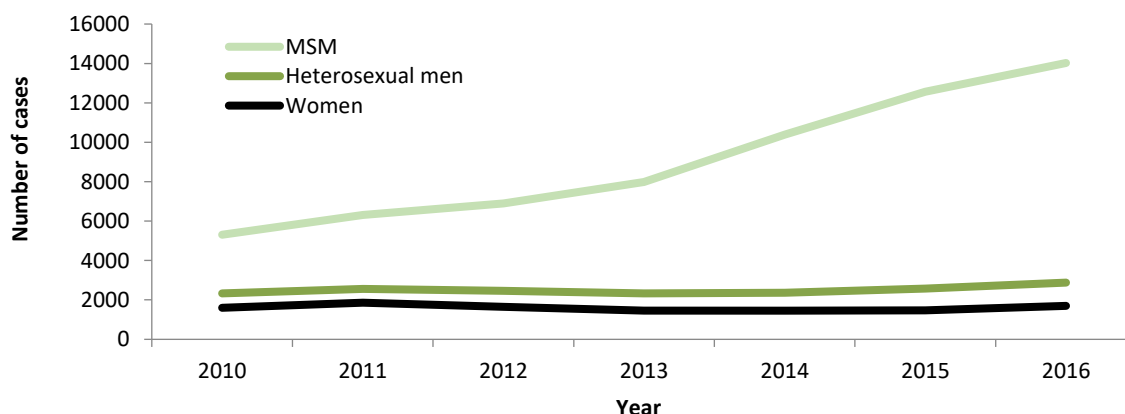
Trends by transmission group (Figure 7) in countries which provided transmission category data between 2010 and 2016 show a steep increase in reported cases among MSM; cases among heterosexuals appear to be stable in recent years.

Figure 6. Rate of confirmed syphilis cases per 100 000 population by gender and year, EU/EEA countries reporting consistently, 2007–2016



Source: Country reports from the Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Ireland, Italy, Latvia, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 7. Number of confirmed syphilis cases by gender, transmission category and year, EU/EEA countries reporting consistently, EU/EEA, 2010–2016



Source: Country reports from the Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Discussion

Rates of reported syphilis cases continued to increase in 2016. The increase was driven by cases reported among men, specifically among MSM. Trends among heterosexual men and women, on the other hand, appear stable although there was a slight increase among both groups in 2016. Even in countries not reporting transmission data (e.g. Poland), MSM appear to contribute a significant proportion of syphilis cases [5]. The continuing increase among MSM, which is also observed for gonorrhoea and HIV, is likely to be due to both behavioural factors and testing strategies. The concomitant rising trends for sexually transmitted infections [6-10] in many countries suggest increasing high-risk behaviour among MSM [9], possibly in the context of HIV sero-adaptive behaviours (explained in [10]). This is particularly relevant when considering the high proportion of HIV co-infections, especially among MSM. The introduction of pre-exposure prophylaxis for HIV (PrEP) might also affect trends in the future due to both changing sexual behaviour and, in particular, increased testing for sexually transmitted infections as part of client management pathways [11-13]. It is important, therefore, that PrEP is introduced as part of a comprehensive HIV prevention package that also includes safer sex interventions. In addition, the increasing popularity of geospatial social networking/dating applications may facilitate more sexual encounters and STI transmission [14,15] although these applications may also be used to effectively deliver public health messages [16].

Low rates of syphilis infections among women are important considering the potentially devastating consequences of syphilis in pregnancy. A number of countries outside Europe have reported recent increases in rates among women and in congenital syphilis cases [17-19]. It is therefore important to carefully assess the increase in syphilis cases among women observed in many European countries while at the same time ensuring that syphilis screening programmes are implemented effectively.

Reported rates of syphilis infection across Europe vary from below 1 case per 100 000 population in Croatia to 9.9 cases per 100 000 in the United Kingdom. The range in reported rates of infection is narrower compared to other STIs such as chlamydia and gonorrhoea. This likely reflects the long-standing surveillance for syphilis infection, frequently with serological methods that are less prone to differences in testing strategies and methods than those used for other bacterial STIs. Cases are diagnosed at different stages of the disease, possibly reflecting different access to diagnostic services across Europe and/or awareness of the infection. Differences in surveillance systems may also play a part; reporting of non-infectious cases, for example, may contribute to differences in overall numbers between countries.

Overall, data completeness has improved over time, but for some variables it is still difficult to interpret the reported data. Comparisons across countries should be made with caution due to differences in testing, reporting and surveillance systems.

Public health implications

The increasing trends for syphilis observed in many EU/EEA countries, mainly driven by infections among MSM, are likely linked to an increase in risky sexual behaviour. Improved case detection and more complete reporting may also contribute to the observed increase. Promoting safer sexual behaviour, condom use and increasing testing rates among risk groups through targeted prevention campaigns is essential to prevent cases and reduce the risk of the complications of late stages of syphilis. Prevention strategies involving use of social media and dating apps could be considered, in addition to traditional approaches.

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