

# Syphilis

## Annual Epidemiological Report for 2017

### Key facts

- In 2017, 33 189 confirmed syphilis cases were reported in 28 EU/EEA Member States, with the crude notification rate 7.1 cases per 100 000 population.
- Reported syphilis rates were nine times higher in men than in women and peaked among 25–34-year-old men (28 cases per 100 000 population).
- Two-thirds (67%) of 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.
- The slight increase of syphilis rates among women that started in 2016 continued in 2017.

### Methods

This report is based on data for 2017 retrieved from The European Surveillance System (TESSy) on 29 November 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, 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 2017. Thirty EU/EEA Member States (28 EU Member States plus Iceland and Norway) participate in this network.

For 2017, the majority of countries (18) reported data using the standard EU case definitions [4]. Five countries reported using national case definitions and five countries did not state which case definition was in use. Most countries (25) had comprehensive surveillance systems. Three countries reported data derived from sentinel systems that only captured syphilis diagnoses from a selection of healthcare providers. Reporting of syphilis

---

Suggested citation: European Centre for Disease Prevention and Control. Syphilis. In: ECDC. Annual epidemiological report for 2017. Stockholm: ECDC; 2019.

Stockholm, July 2019

© European Centre for Disease Prevention and Control, 2019. Reproduction is authorised, provided the source is acknowledged.

infection is compulsory in 24 countries and 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 included 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, irrespective of the stage of infection, 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 2017, 33 189 confirmed syphilis cases were reported in 28 countries, giving a crude notification rate of 7.1 cases per 100 000 population (Table 1) for countries with comprehensive surveillance systems. The highest rate was observed in Iceland (15.4 cases per 100 000 population), followed by Malta (13.5), the United Kingdom (11.8) and Spain (10.3). Low rates below 3 cases per 100 000 population were observed in Croatia, Cyprus, Estonia, Italy, Portugal and Slovenia (Figure 1).

**Table 1. Distribution of confirmed syphilis cases and rates per 100 000 population by country and year, EU/EEA, 2013–2017**

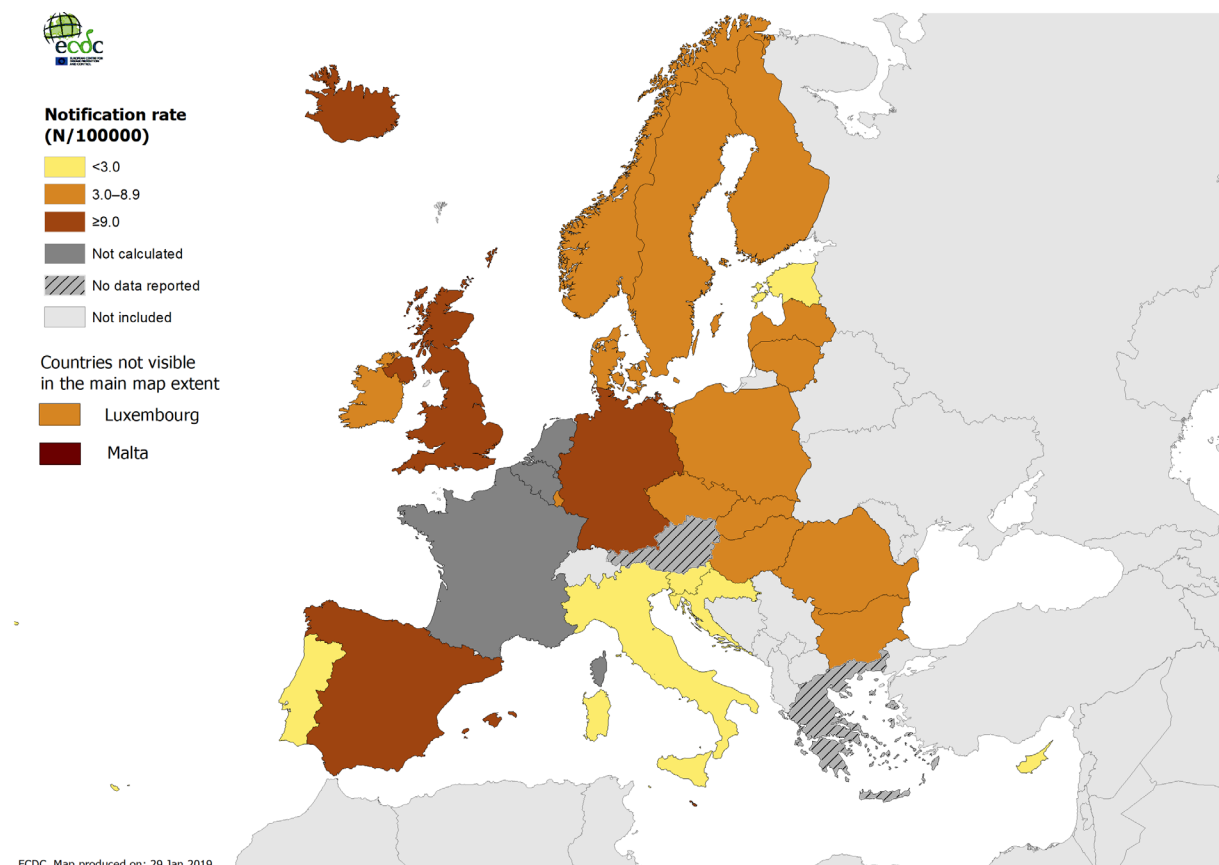
Country	2013		2014		2015		2016		2017		
	Confirmed cases	Rate	Confirmed cases	Rate	Confirmed cases	Rate	Confirmed cases	Rate	Confirmed cases	Rate	Reported cases
Austria	538	-	-	-	-	-	-	-	-	-	-
Belgium	867	-	872	-	892	-	1 531	-	1 493	-	1 493
Bulgaria	354	4.9	460	6.3	465	6.5	367	5.1	516	7.3	516
Croatia	80	1.9	51	1.2	25	0.6	27	0.6	29	0.7	29
Cyprus	12	1.4	18	2.1	31	3.7	16	1.9	21	2.5	21
Czech Republic	402	3.8	408	3.9	554	5.3	546	5.2	560	5.3	560
Denmark	317	5.7	361	6.4	777	13.7	365	6.4	325	5.7	325
Estonia	39	3.0	35	2.7	25	1.9	28	2.1	34	2.6	34
Finland	153	2.8	196	3.6	243	4.4	211	3.8	175	3.2	186
France	1 014	-	1 405	-	1 755	-	1 863	-	1 748	-	1 748
Germany	5 324	6.6	5 821	7.2	6 705	8.3	7 172	8.7	7 473	9.1	7 473
Greece	300	-	247	-	320	-	348	3.2	-	-	-
Hungary	627	-	622	6.3	617	6.3	712	7.2	728	7.4	728
Iceland	3	0.9	25	7.7	23	7.0	30	9.0	52	15.4	52
Ireland	163	3.5	204	4.4	276	5.9	295	6.2	392	8.2	392
Italy	1 170	2.0	1 151	1.9	1 060	1.7	1 420	2.3	1 631	2.7	1 633
Latvia	127	6.3	139	6.9	141	7.1	164	8.3	135	6.9	135
Lithuania	269	9.1	257	8.7	130	4.5	151	5.2	157	5.5	157
Luxembourg	27	5.0	27	4.9	21	3.7	27	4.7	26	4.4	26
Malta	45	10.7	49	11.4	41	9.3	40	8.9	62	13.5	62
Netherlands	743	-	975	-	1 221	-	1 515	-	1 519	-	1 519
Norway	185	3.7	189	3.7	172	3.3	188	3.6	223	4.2	223
Poland	1 324	3.5	1 147	3.0	1 239	3.3	1 291	3.4	1 593	4.2	1 593
Portugal	155	1.5	101	1.0	43	0.4	73	0.7	79	0.8	79
Romania	1 393	7.0	1 267	6.4	969	4.9	947	4.8	814	4.1	814
Slovakia	337	6.2	369	6.8	295	5.4	373	6.9	361	6.6	361
Slovenia	35	1.7	23	1.1	43	2.1	35	1.7	48	2.3	48
Spain	3 723	8.0	3 568	7.7	3 756	8.1	3 356	7.2	4 813	10.3	4 813
Sweden	275	2.9	244	2.5	326	3.3	348	3.5	384	3.8	384
United Kingdom	3 665	5.7	4 787	7.4	5 809	9.0	6 505	9.9	7 798	11.8	7 798
<b>EU/EEA</b>	<b>23 666</b>	<b>5.1</b>	<b>25 018</b>	<b>5.4</b>	<b>27 974</b>	<b>5.9</b>	<b>29 944</b>	<b>6.1</b>	<b>33 189</b>	<b>7.1</b>	<b>33 202</b>

*Rates presented only for countries with comprehensive surveillance systems.*

*..: no data reported*

*-.: no rate calculated.*

*Liechtenstein does not participate in the European Sexually Transmitted Infections Surveillance Network thus is not included in the table.*

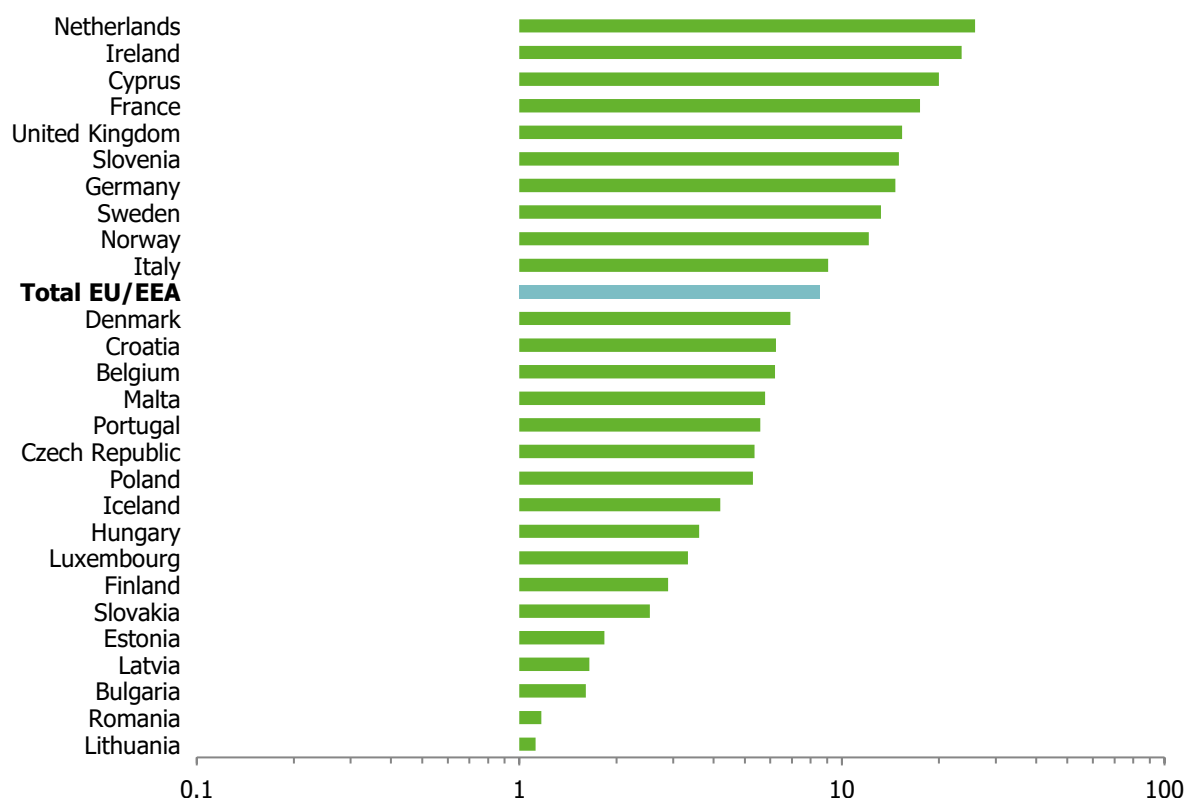
**Figure 1. Distribution of confirmed syphilis cases per 100 000 population by country, EU/EEA, 2017**

Source: Country reports from Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. Rates not calculated for Belgium, France and the Netherlands, countries with sentinel systems.

## Gender

The overall male-to-female ratio in 2017 was 8.5:1, with rates of 12.0 cases per 100 000 population in men (25 229 cases) and 1.4 cases per 100 000 population in women (2 961 cases). The highest rates among men (above 15 cases per 100 000 population) were observed in Germany, Iceland, Ireland, Malta and the United Kingdom. Rates among women were highest (above 3 cases per 100 000 population) in Bulgaria, Hungary, Iceland, Latvia, Lithuania, Malta, Romania and Slovakia. There were marked differences in the male-to-female ratios across countries: ratios of/above 15:1 were reported by Cyprus, France, Ireland, the Netherlands, Slovenia and the United Kingdom, while five countries reported male-to-female ratios below 2:1 (Bulgaria, Estonia, Latvia, Lithuania and Romania). The overall male-to-female ratio has increased continuously from 1.4:1 in 2000 to a maximum of 8.5:1 in 2017.

Compared with 2016, rates continued to increase in 2017 among both genders, by 12.3% for men and by 4.5% for women, following a previously observed trend. In 2017, increases among men have been observed in 18 of 24 countries and among women in 12 of 24 countries with comprehensive systems that reported in both years. There was no obvious regional pattern.

**Figure 2. Syphilis, male-to-female ratio in 27 EU/EEA countries, 2017**

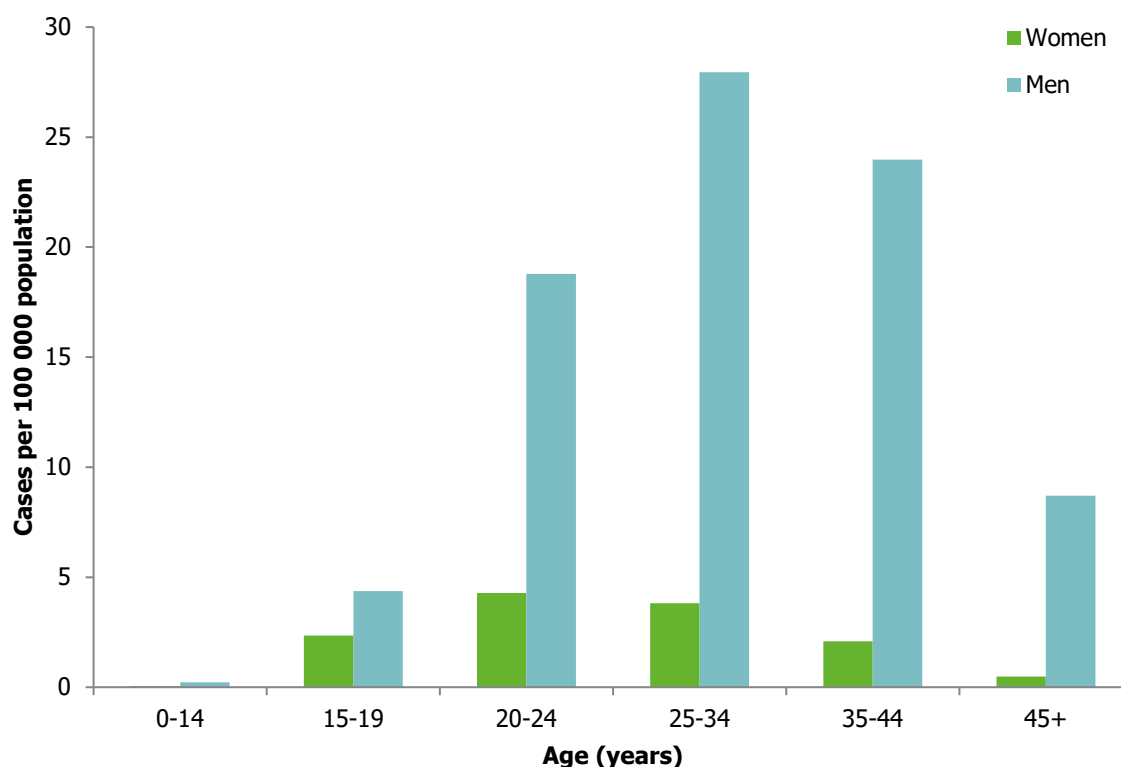
*Note: Spain did not report gender information and was therefore not included.*

## Age

Information on age was available for cases reported from 24 countries in 2017. It was not available or was reported in a format not suitable for analysis for Belgium, Bulgaria, Poland and Spain, which accounted for 25% of all cases. In 2017, the largest proportion of cases was reported in the population group 45 years or older (31%). However, similarly large proportions of cases were reported in the age groups 25–34 (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 (16 per 100 000), but were also high among 35–44-year-olds (13 per 100 000) and 20–24-year-olds (12 per 100 000; 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 (28 cases per 100 000 population). Compared with 2016, age-specific rates in 2017 increased across all age groups for men and in the age group from 15–34 years for women.

**Figure 3. Distribution of confirmed syphilis cases per 100 000 population by age and gender, EU/EEA, 2017**



Source: Country reports from Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom. Data not available or not suitable for analysis from Belgium, Bulgaria, France, the Netherlands, Poland and Spain.

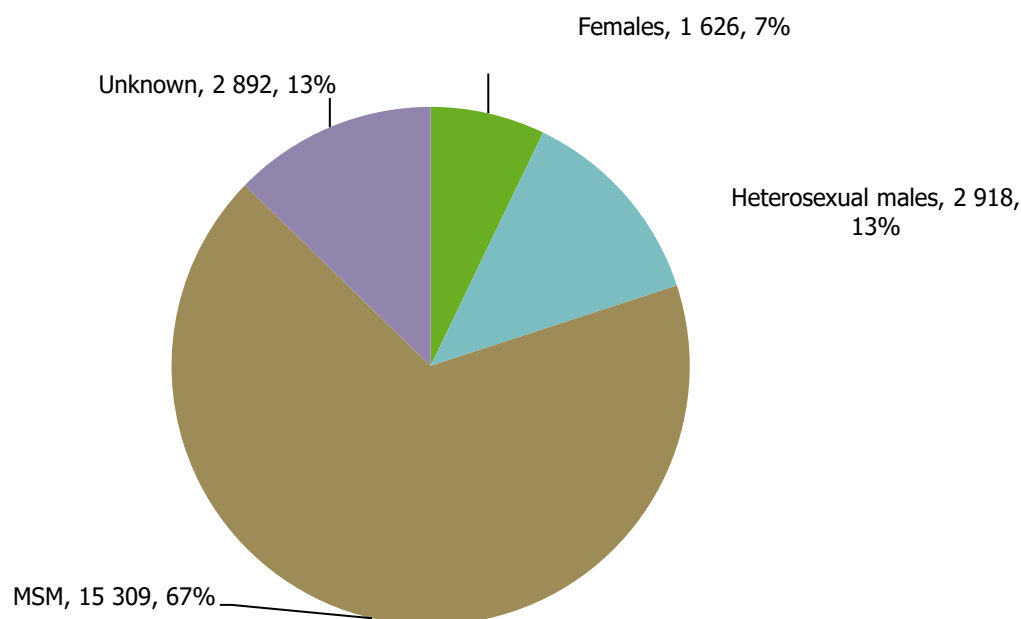
### Transmission, HIV status and syphilis stage

For 2017, 16 countries reported information on transmission category for more than 60% of their cases. They accounted for 69% (n=22 745) of all reported syphilis cases. Among these cases, transmission category was indicated as MSM in 67%, heterosexual in 20% (males: 13%; females: 7%) and unknown in 13% (Figure 4). The percentage of cases diagnosed in MSM ranged from 25% or below in Hungary, Latvia, Romania and Slovakia to more than 75% in France, the Netherlands, Norway, Sweden and the United Kingdom.

For 2017, information on HIV co-infection status was reported by 16 countries, accounting for 45% of syphilis cases (n=14 825). Of these, 26% were HIV-positive (either known or newly diagnosed) and 56% were HIV-negative. HIV status was unknown for 18%. Of the MSM cases with known HIV status (after excluding the 'unknowns'), 39% were HIV-positive.

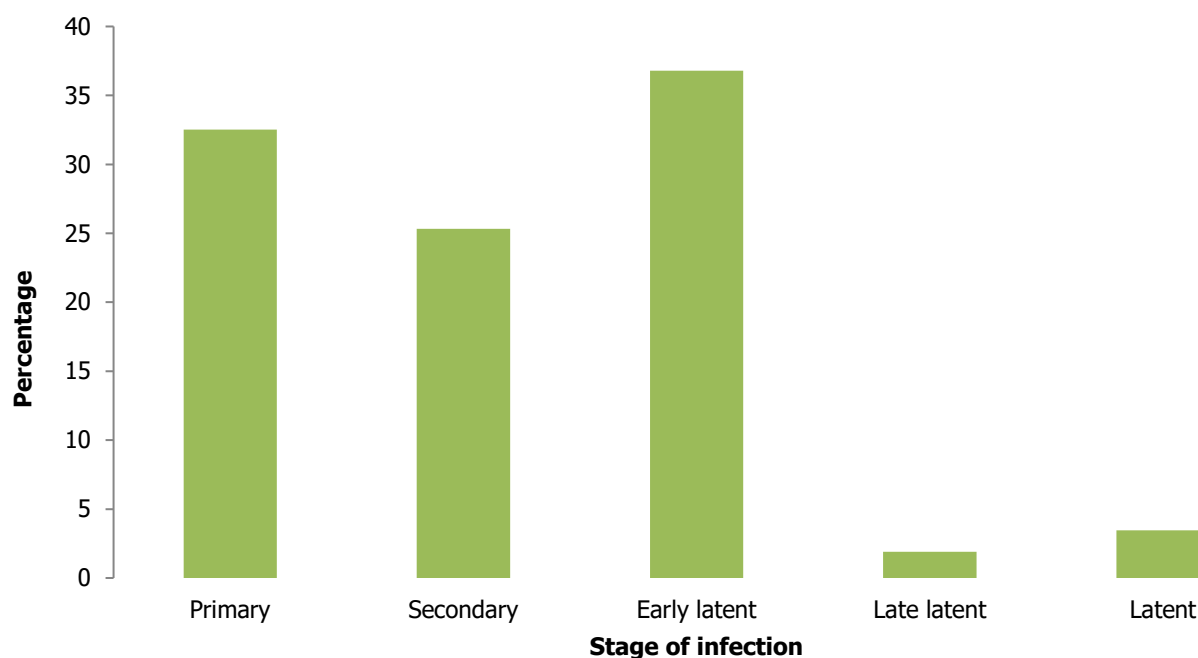
Details on the clinical stage of syphilis infection were provided by 15 countries for 42% of all reported cases in 2017. The majority were reported as 'primary' (33%), 'secondary' (25%) or 'early latent' infection (37%; Figure 5), while a few cases were reported as 'late latent' (1.9%) or 'latent' syphilis infection (i.e. the duration of the infection was unknown; 3.5%). Distribution across countries varied. In the Czech Republic, Estonia, France, Ireland, Norway, Slovakia and the United Kingdom, more than half of reported cases had primary and/or secondary syphilis. In Latvia and Romania, early latent syphilis cases exceeded those reported as primary and secondary syphilis. Iceland (58%), Lithuania (39%) and Malta (42%) reported the largest proportion of cases as latent syphilis.

**Figure 4. Percentage of syphilis infections by transmission category and gender (n=22 745), EU/EEA, 2017**



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

**Figure 5. Distribution of reported syphilis infection stages, EU/EEA, 2017**



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

## Trends 2008–2017

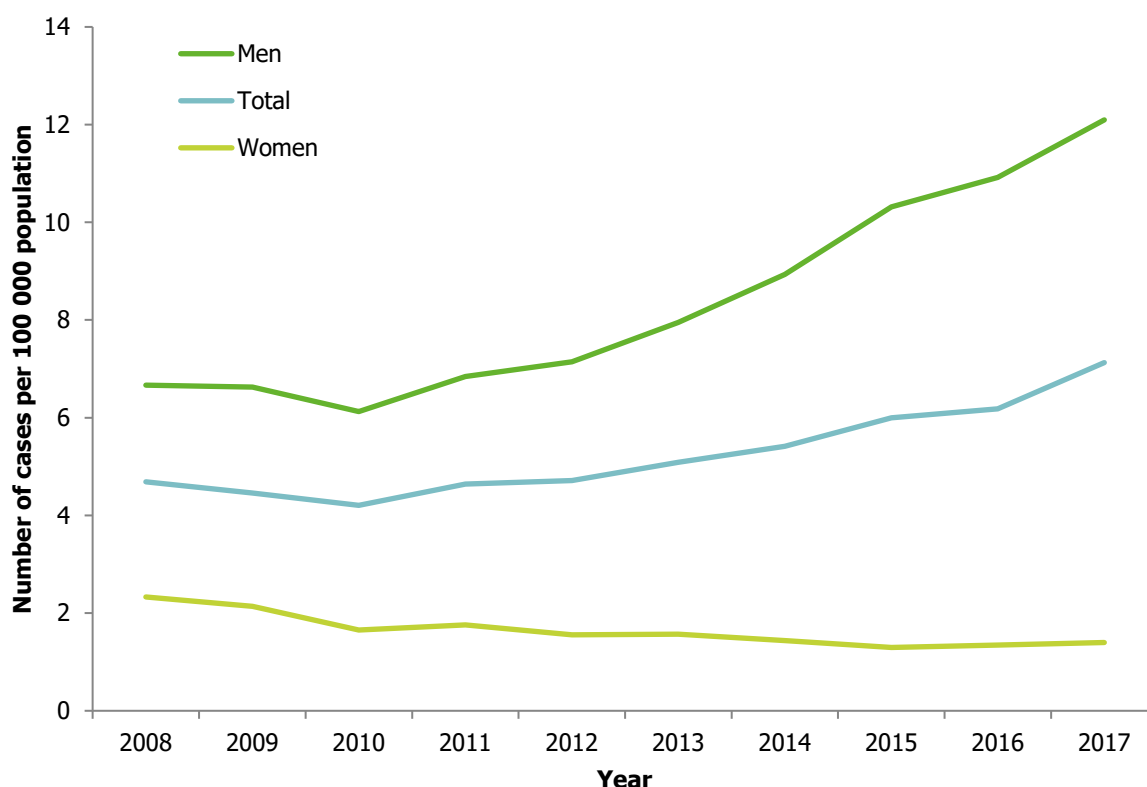
Between 2008 and 2017, 240 707 cases of syphilis were reported in 30 EU/EEA countries. During this period, 27 countries consistently reported data. In addition, Austria reported data until 2013, Croatia reported data from 2012 onwards following accession to the EU and Greece did not report data for 2017. Among countries reporting consistently between 2008 and 2017, the trend of reported syphilis infections per 100 000 population was stable between 2008 and 2010 (Figure 6). However, starting in 2011, 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 until 2015, after which the rates among women started to increase slightly.

Between 2010 and 2017, many countries, particularly in western Europe, observed a sharp increase in the number of reported syphilis infections, with increases of 50–100% in Luxembourg, Norway, Poland, Spain and Sweden. Cases more than doubled in Belgium, France, Germany, Malta, the Netherlands and the United Kingdom. The largest increases were in Iceland, from 5 cases in 2010 to 52 in 2017, and Ireland, from 115 to 392.

In the past 10 years, the proportion of cases among age groups below 45 years decreased or was stable, while the proportion of those aged 45 years and over increased from 22% to 31%. While decreasing or stabilising between 2008 and 2010, age-specific rates have continuously increased since 2011 and up until 2017 among all age groups over 19 years (20–24: +44%, 25–34: +77%, 35–44: +83%, 45 and over: +109%). In persons 15–19 years of age, the rate stayed at low levels between 2008 and 2016 and displayed minor fluctuations, but increased by 19% in 2017 compared with 2016.

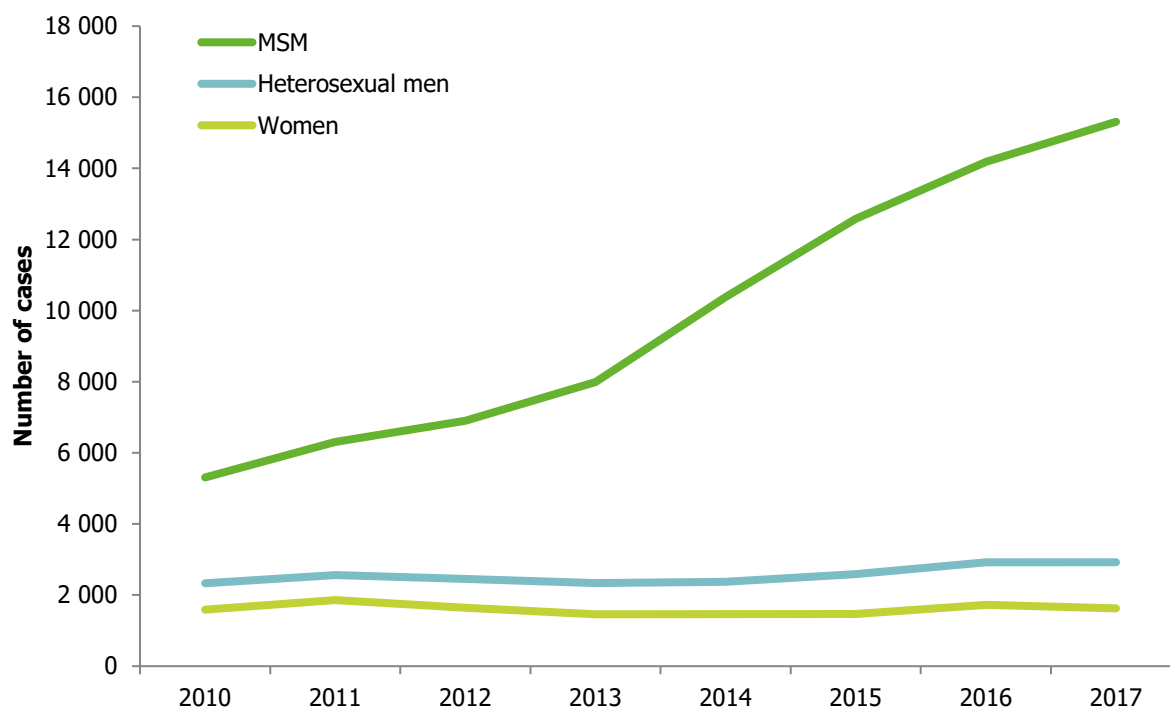
Trends by transmission group (Figure 7) in countries that provided transmission category data from 2010–2017 show a steep increase in reported cases among MSM, while cases among heterosexuals appear to be stable in recent years.

**Figure 6. Rate of confirmed syphilis cases per 100 000 population by gender and year, EU/EEA countries reporting consistently, 2008–2017**



Source: Country reports from Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Ireland, Italy, Latvia, Lithuania, 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, 2010–2017**



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

The rate of reported syphilis cases continued to increase in 2017, reflecting the ongoing epidemic. The increase was driven by cases reported among men, specifically MSM. The trend among heterosexual men, on the other hand, appears stable at EU/EEA level. The slight increase of syphilis among women that started in 2016 continued in 2017. The continuing increase among MSM, which was also observed for gonorrhoea and HIV, is likely due to both behavioural factors such as increasing condomless anal sex, and more intense testing practices. The concomitant rising trends for sexually transmitted infections [5–9] in many countries suggest increasing high-risk behaviour among MSM [8], possibly in the context of HIV seroadaptive behaviours [9]. 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) is likely to also affect future trends in a negative way due to both risk compensation and particularly increased frequency of testing for STIs as part of client management pathways [10–12]. It is therefore important 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 [13,14], although these applications may also be used to effectively deliver public health messages [15].

Despite the slight increase observed over the last two years, rates of syphilis infections among women remained low in 2017. This is important to maintain considering the potentially devastating consequences of syphilis in pregnancy and reports of increasing congenital syphilis cases following increases of syphilis among women in several countries, including the United States [16,17]. It is therefore important to monitor syphilis trends among women while at the same time ensuring that antenatal screening programmes are implemented effectively and retesting for syphilis during the third trimester (weeks 28–32) is offered to women at higher risk of infection [18].

Reported rates of syphilis infection across the EU/EEA vary from below 1 case per 100 000 population in Croatia and Portugal to >10 cases per 100 000 in Iceland, Malta, Spain and 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 and the widespread availability of simple serological diagnostic methods that are less prone to differences in testing strategies and methods than those used for other bacterial STIs. Differences in rates also reflect accelerated transmission in some countries such as Iceland [19] and Ireland [20] that have seen record levels of syphilis cases and accounted for the largest relative increases in 2017 compared with 2016.

Cases are diagnosed at different stages of the disease, possibly reflecting different access to diagnostic services across Europe and/or awareness of the infection. A high proportion of primary and secondary syphilis cases may also reflect ongoing transmission and the need for effective public health interventions [21], while a larger proportion of early latent or late latent syphilis may result from intensified screening [22].

Any data comparisons across countries should be made with caution due to differences in testing, reporting and surveillance systems.

## Public health implications

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, consistent condom use and encouraging frequent testing among groups at high risk through targeted prevention campaigns is essential to prevent transmission, detect current infections and reduce the risk of the complications of late stages of syphilis. Novel approaches involving the use of social media and dating apps could be considered, in addition to traditional case finding and partner notification methods, for cases with a high proportion of anonymous sexual contacts.

## References

1. European Centre for Disease Prevention and Control. Introduction to the Annual Epidemiological Report. In: ECDC. Annual epidemiological report for 2017 [Internet]. Stockholm: ECDC; 2017 [cited 29 November 2018]. Available from: <http://ecdc.europa.eu/annual-epidemiological-reports/methods>
2. European Centre for Disease Prevention and Control. Surveillance systems overview for 2017 [Internet, downloadable spreadsheet] Stockholm: ECDC; 2018 [cited 29 November 2018]. Available from: <http://ecdc.europa.eu/publications-data/surveillance-systems-overview-2017>
3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases [Internet] Stockholm: ECDC; 2018 [cited 29 November 2018]. Available from: <http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=50>
4. European Centre for Disease Prevention and Control. EU case definitions [Internet] Stockholm: ECDC; 2018 [cited 29 November 2018]. Available from: <https://ecdc.europa.eu/infectious-diseases-public-health/surveillance-and-disease-data/eu-case-definitions>
5. Simms I, Field N, Jenkins C, Childs T, Gilbert VL, Dallman TJ, et al. Intensified shigellosis epidemic associated with sexual transmission in men who have sex with men--*Shigella flexneri* and *S. sonnei* in England, 2004 to end of February 2015. *Euro Surveill.* 2015 Apr 16;20(15). Available from: <http://www.eurosurveillance.org/content/10.2807/1560-7917.ES2015.20.15.21097>
6. Pharris A, Quinten C, Tavošchi L, Spiteri G, Amato-Gauci AJ, Network EHAS. Trends in HIV surveillance data in the EU/EEA, 2005 to 2014: new HIV diagnoses still increasing in men who have sex with men. *Euro Surveill.* 2015;20(47). Available from: <http://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2015.20.47.30071>
7. Mohammed H, Mitchell H, Sile B, Duffell S, Nardone A, Hughes G. Increase in Sexually Transmitted Infections among Men Who Have Sex with Men, England, 2014. *Emerg Infect Dis.* 2016 Jan;22(1):88-91.
8. Jansen K, Schmidt AJ, Drewes J, Bremer V, Marcus U. Increased incidence of syphilis in men who have sex with men and risk management strategies, Germany, 2015. *Euro Surveill.* 2016 Oct 27;21(43). Available from: <http://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2016.21.43.30382>
9. Rönn M, White PJ, Hughes G, Ward H. Developing a Conceptual Framework of Seroadaptive Behaviors in HIV-Diagnosed Men Who Have Sex With Men. *J Infect Dis.* 2014 Dec 1;210 Suppl 2:S586-93.
10. Molina JM, Capitant C, Spire B, Pialoux G, Cotte L, Charreau I, et al. On-Demand Preexposure Prophylaxis in Men at High Risk for HIV-1 Infection. *N Engl J Med.* 2015 Dec 3;373(23):2237-46.
11. McCormack S, Dunn DT, Desai M, Dolling DI, Gafos M, Gilson R, et al. Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *Lancet.* 2016 Jan 2;387(10013):53-60.
12. Alaei K, Paynter CA, Juan SC, Alaei A. Using preexposure prophylaxis, losing condoms? Preexposure prophylaxis promotion may undermine safe sex. *AIDS.* 2016 Nov 28;30(18):2753-2756.
13. Thomas DR, Williams CJ, Andrady U, Anderson V, Humphreys S, Midgley CM, et al. Outbreak of syphilis in men who have sex with men living in rural North Wales (UK) associated with the use of social media. *Sex Transm Infect.* 2016 Aug;92(5):359-64.
14. Gilbert VL, Simms I, Jenkins C, Furegato M, Gobin M, Oliver I, et al. Sex, drugs and smart phone applications: findings from semistructured interviews with men who have sex with men diagnosed with *Shigella flexneri* 3a in England and Wales. *Sex Transm Infect.* 2015 Dec;91(8):598-602.
15. European Centre for Disease Prevention and Control. Understanding the impact of smartphone applications on STI/HIV prevention among men who have sex with men in the EU/EEA. Stockholm: ECDC; 2015. Available from: <http://ecdc.europa.eu/en/publications/publications/impactsmartphone-applications-sti-hiv-prevention-among-men-who-have-sex-with-men.pdf>
16. Burghardt N, Chow J, Stoltey J, Bauer H. Raising the Bar on Congenital Syphilis (CS) Prevention: Using a Cascade to Identify Gaps in Care and Opportunities for Intervention in the California Project Area (CPA), 2015-2017. *Sex Transm Dis.* 2018;45:S23.
17. Kidd S, Bowen VB, Torrone EA, Bolan G. Use of National Syphilis Surveillance Data to Develop a Congenital Syphilis Prevention Cascade and Estimate the Number of Potential Congenital Syphilis Cases Averted. *Sex Transm Dis.* 2018 Sep;45(9S Suppl 1):S23-S8.

18. European Centre for Disease Prevention and Control. Antenatal screening for HIV, hepatitis B, syphilis and rubella susceptibility in the EU/EEA – addressing the vulnerable populations. Stockholm: ECDC; 2017. Available from: <https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/antenatal-screening-sci-advice-2017.pdf>
19. Directorate of Health. Chief Epidemiologist for Iceland. Reportable diseases in the autumn of 2017. Volume 11. Issue 1. January 2018.
20. Cullen P. Record levels of syphilis cases reported to HSE. The Irish Times. 2018 Nov 29, 2018.
21. Patton ME, Su JR, Nelson R, Weinstock H, Centers for Disease C, Prevention. Primary and secondary syphilis--United States, 2005-2013. MMWR Morbidity and mortality weekly report. 2014;63(18):402-6.
22. Chow EPF, Callander D, Fairley CK, Zhang L, Donovan B, Guy R, et al. Increased Syphilis Testing of Men Who Have Sex With Men: Greater Detection of Asymptomatic Early Syphilis and Relative Reduction in Secondary Syphilis. Clin Infect Dis. 2017 Aug 1;65(3):389-95.