

# Syphilis

## Annual Epidemiological Report for 2019

### Key facts

- In 2019, 35 039 confirmed syphilis cases were reported in 29 EU/EEA Member States, with a crude notification rate of 7.4 cases per 100 000 population.
- Reported syphilis rates were nine times higher in men than in women, peaking in the male age group 25–34-years (31 cases per 100 000 population).
- The majority (74%) of syphilis cases with information on transmission category were reported in men who have sex with men (MSM).
- Between 2010 and 2017, the trend in syphilis notifications among men continuously increased, mainly due to an increase in the number of cases among MSM, however this increase seems to have slowed down in 2018 and 2019. During the same period there were very small fluctuations in syphilis notifications among heterosexuals at EU/EEA level.
- In 2019, the number of MSM cases with HIV-positive status decreased by 1%, while the number of MSM cases with HIV-negative status increased by 2% compared with 2018.

### Introduction

Syphilis is a sexually-transmitted infection caused by the bacterium *Treponema pallidum* [1]. It can also be transmitted from mother-to-child (congenital syphilis). Syphilis can be acquired during sexual activity by direct contact with treponema-rich, open lesions and contaminated secretions from an infected partner. After an average incubation period of three weeks (range 10–90 days) a lesion (chancre, that is usually painless) appears at the site of infection (primary syphilis), followed by a series of eruptions on mucous membranes and skin (secondary syphilis). Untreated infection can become latent, early latent (acquired <1 year) and late latent syphilis (acquired >1 year). Many years after the initial infection, tertiary syphilis lesions may appear (visceral, multi-organ involvement, including serious vascular and neurological damage). Treatment regimens adapted to the stage of infection can effectively cure the infection [2]. Re-infections with syphilis are possible following unprotected sexual contact.

### Methods

This report is based on data for 2019 retrieved from The European Surveillance System (TESSy) on 9 September 2021. 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 of ECDC Annual Epidemiological Report 2019 [3].

An overview of the national surveillance systems is available online [4].

A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [5].

For 2019, the majority of countries (20/29) reported data using the standard EU case definitions [6]. Five countries reported using national case definitions and four countries did not state which case definition was in use. Most countries (26) 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 infection is compulsory in 25 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 for some countries might also include cases of non-infectious syphilis (late latent syphilis, acquired >1 year) that are not under EU/EEA surveillance. It was not possible to exclude cases of late latent syphilis for some countries because they did not provide information on infection stages. Cases reported from Greece for 2019 are provisional and will be retrospectively updated with the 2020 data upload.

## Epidemiology

### Geographic distribution

In 2019, 35 039 confirmed syphilis cases were reported in 29 countries, giving a crude notification rate of 7.4 cases per 100 000 population (Table 1) for countries with comprehensive surveillance systems. The highest rate was observed in Malta (19.2 cases per 100 000 population), followed by Ireland (15.1), the United Kingdom (13.1), Iceland (10.6) and Spain (10.4). Low rates of below three cases per 100 000 population were observed in Croatia, Estonia, Romania and Slovenia (Table 1). Lithuania reported zero confirmed cases.

**Table 1. Distribution of confirmed syphilis cases and rates per 100 000 population by country and year, EU/EEA, 2015–2019**

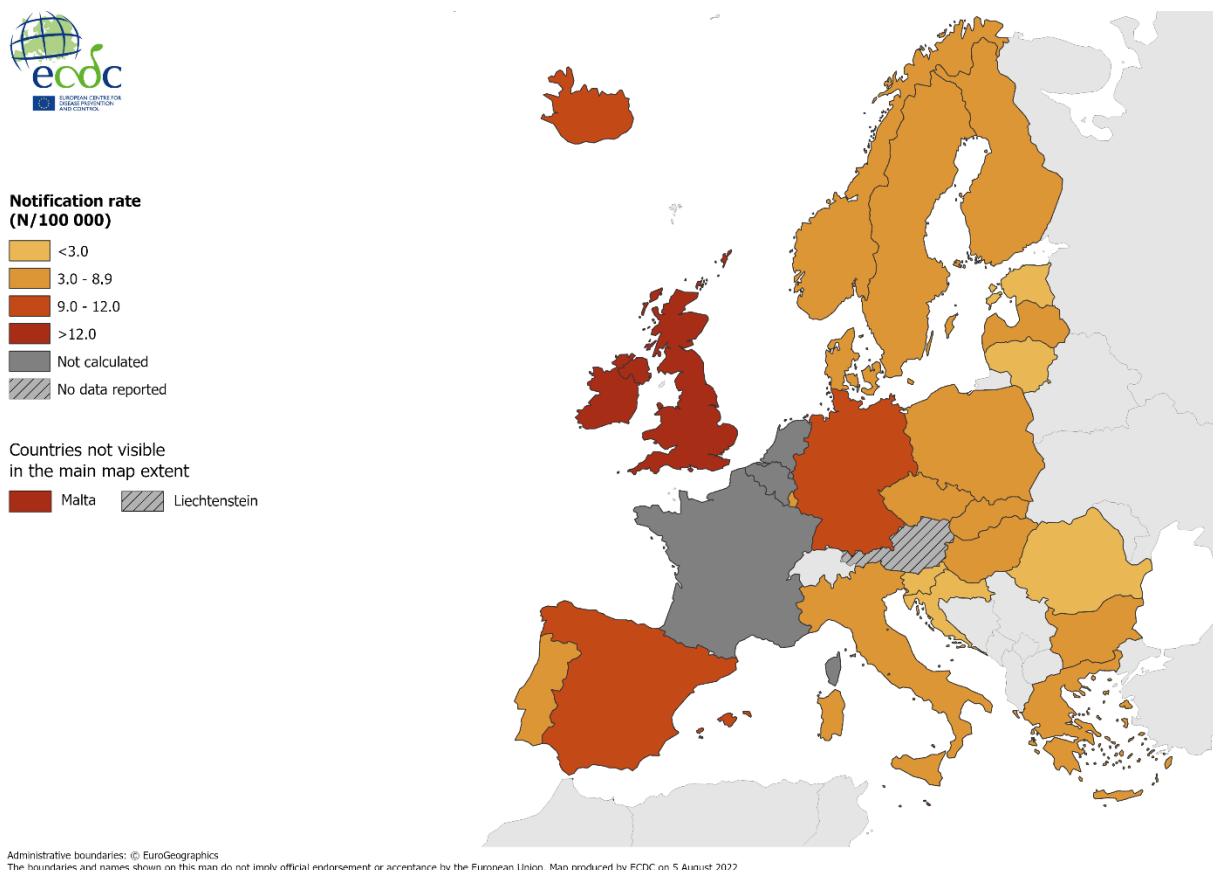
Country	2015		2016		2017		2018		2019	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	.	.	.	.	.	.	.	.	.	.
Belgium	892	-	1 531	-	1493	-	1 901	-	1670	-
Bulgaria	465	6.5	367	5.1	516	7.3	485	6.9	480	6.9
Croatia	25	0.6	27	0.6	29	0.7	35	0.9	28	0.7
Cyprus	31	3.7	16	1.9	21	2.5	44	5.1	31	3.5
Czechia	554	5.3	546	5.2	578	5.5	596	5.6	611	5.7
Denmark	777	13.7	365	6.4	325	5.7	322	5.6	361	6.2
Estonia	25	1.9	28	2.1	34	2.6	27	2.0	37	2.8
Finland	243	4.4	211	3.8	175	3.2	181	3.3	251	4.5
France	1 755	-	1 863	-	1 748	-	1 606	-	1 080	-
Germany	6 706	8.3	7 183	8.7	7 530	9.1	7 354	8.9	7 883	9.5
Greece	320	-	0	0.0	395	3.7	389	3.6	368	3.4
Hungary	617	6.3	712	7.2	728	7.4	675	6.9	788	8.1
Iceland	23	7.0	30	9.0	52	15.4	22	6.3	38	10.6
Ireland	276	5.9	297	6.3	402	8.4	485	10.0	740	15.1
Italy	1 060	1.7	1 420	2.3	1 631	2.7	1 526	2.5	1 826	3.0
Latvia	141	7.1	164	8.3	139	7.1	104	5.4	75	3.9
Liechtenstein	.	.	.	.	.	.	.	.	.	.
Lithuania	130	4.5	151	5.2	157	5.5	130	4.6	0	0.0
Luxembourg	21	3.7	27	4.7	26	4.4	103	17.1	51	8.3
Malta	41	9.3	40	8.9	62	13.5	85	17.9	95	19.2
Netherlands	1 221	-	1 515	-	1 519	-	1 355	-	1 474	-
Norway	172	3.3	188	3.6	223	4.2	231	4.4	205	3.8
Poland	1 239	3.3	1 291	3.4	1 593	4.2	1 445	3.8	1 627	4.3
Portugal	43	0.4	73	0.7	105	1.0	255	2.5	419	4.1
Romania	970	4.9	948	4.8	823	4.2	638	3.3	539	2.8
Slovakia	295	5.4	374	6.9	379	7.0	433	8.0	262	4.8
Slovenia	43	2.1	35	1.7	48	2.3	52	2.5	54	2.6
Spain	3 756	8.1	3 356	7.2	4 941	10.6	4 826	10.3	4 880	10.4
Sweden	326	3.3	348	3.5	385	3.9	479	4.7	428	4.2
United Kingdom	5 809	9.0	6 505	9.9	7 798	11.8	8 328	12.6	8 738	13.1
<b>EU-EEA</b>	<b>27 976</b>	<b>5.9</b>	<b>29 611</b>	<b>6.0</b>	<b>33 855</b>	<b>7.0</b>	<b>34 112</b>	<b>7.1</b>	<b>35 039</b>	<b>7.4</b>

Source: Country reports.

∴: no data reported.

-: no rate calculated.

Note: A total of 171 cases with unknown classification and zero confirmed cases were reported by Lithuania for 2019. Cases with unknown classification are not included in the analysis.

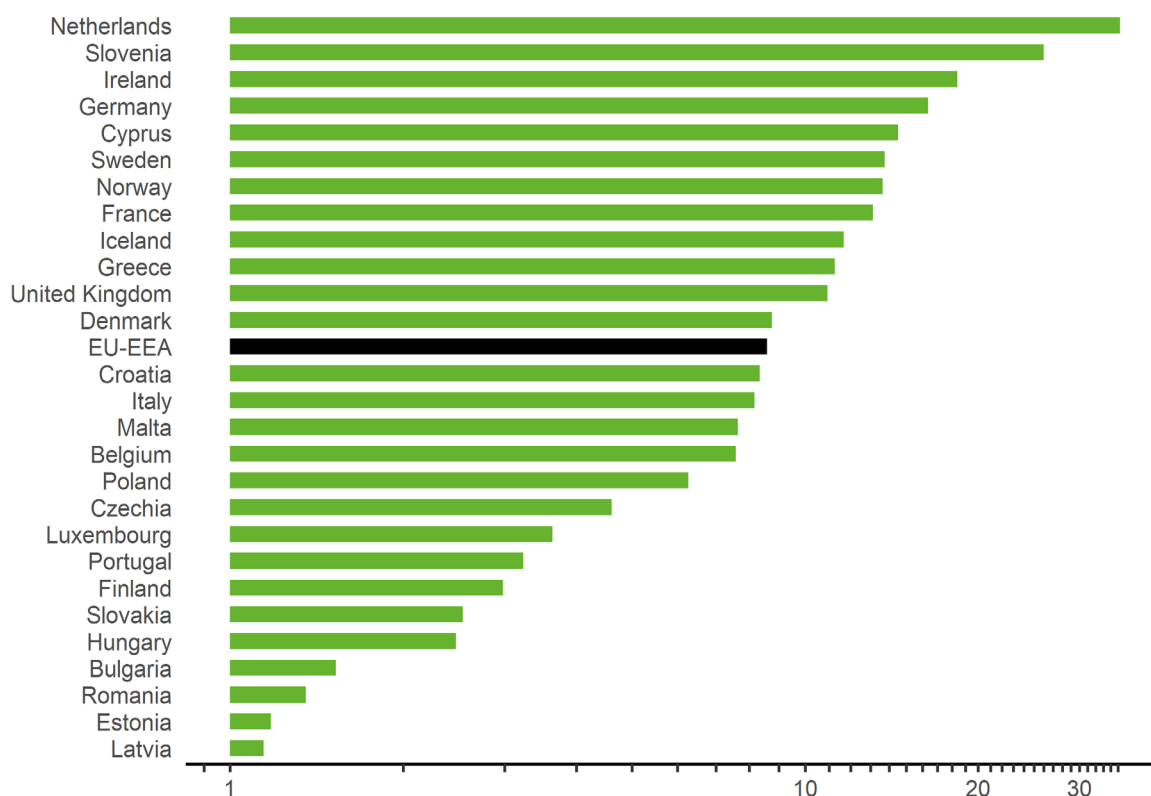
**Figure 1. Distribution of confirmed syphilis cases per 100 000 population by country, EU/EEA, 2019**

## Gender

The overall male-to-female ratio in 2019 was 8.6:1, with rates of 12.8 cases per 100 000 population in men (26 910 cases) and 1.5 cases per 100 000 population in women (3 135 cases). The rate among men increased slightly, from 12.1 cases per 100 000 population in 2018 and the rate among women remained at similar level, 1.4 cases per 100 000 population in 2018.

Among 24 countries with comprehensive systems that reported in both 2018 and 2019, national rates increased among men in 13 countries and among women in 11 countries. In 2019, 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 three cases per 100 000 population) in Bulgaria, Hungary, Latvia, Luxembourg, and Malta.

There were marked differences in the male-to-female ratios across countries: ratios of/above 15:1 were reported by Germany, Ireland, the Netherlands and Slovenia, while four countries reported male-to-female ratios below 2:1 (Bulgaria, Estonia, Latvia and Romania) (Figure 2).

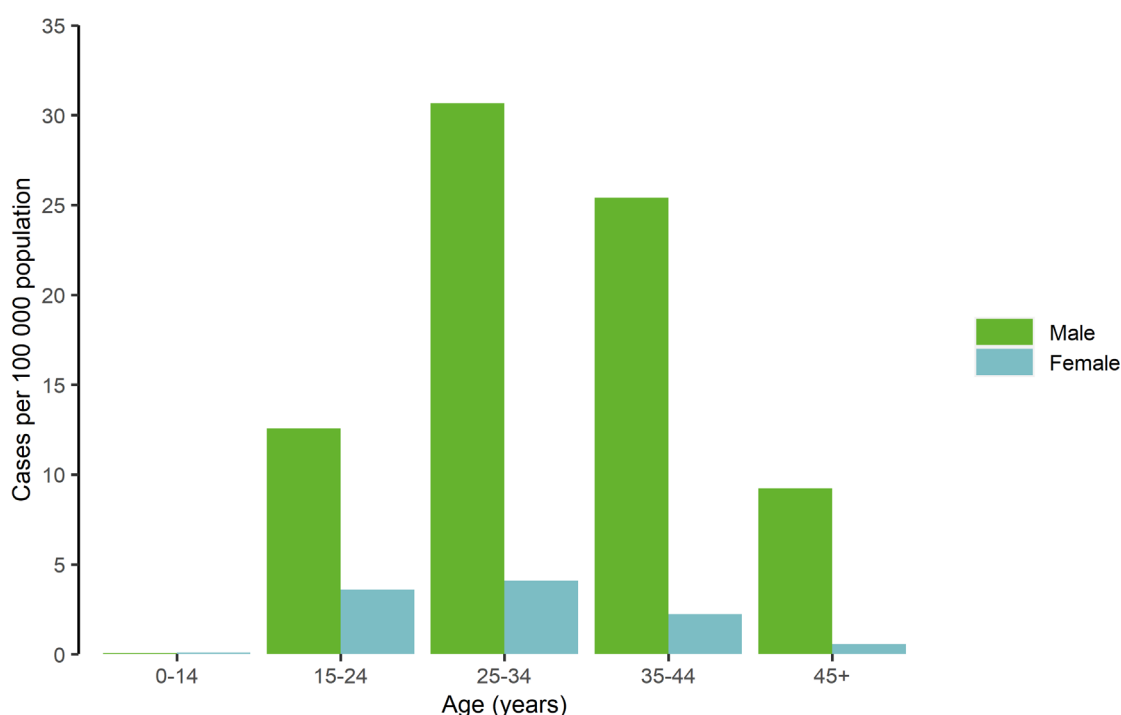
**Figure 2. Syphilis, male-to-female ratio in EU/EEA countries, 2019**

## Age

Information on age was available for cases reported from 24 countries in 2019. It was not available, or reported in a format unsuitable for analysis, for Belgium, Bulgaria, Poland and Spain, which accounted for 25% of all cases. In 2019, the largest proportion of cases was reported in two population groups: 25–34 year-olds and those aged 45 years and above. Each of these two age groups accounted for 31% of all cases. Adults aged 35–44 years accounted for 26% of cases, and young people aged 15–24 years accounted for 12% of all reported cases.

Age-specific rates were higher among men than women across all the age groups (Figure 3). Rates among men were highest among 25–34-year-olds (31 cases per 100 000 population), followed by 35–44-year-olds (25 per 100 000) and 15–24-year-olds (13 per 100 000). Women aged 15–24 years and 25–34 years had the highest age-specific rate: both groups accounted for four cases per 100 000 population. In 2019, age-specific rates remained stable across all age groups for women compared with 2018. Among men, age-specific rates increased in the age groups 25–34-years (from 29 to 31 cases per 100 000 population) and 35–44-years (from 23 to 25 cases per 100 000 population).

**Figure 3. Distribution of confirmed syphilis cases per 100 000 population, by age and gender, EU/EEA, 2019**



### Transmission, HIV status and syphilis stage

For 2019, 16 countries reported information on transmission category relating to over 60% of their cases. These accounted for 44% (n=15 309) of all reported syphilis cases. Among these cases, transmission category was indicated as MSM in 68%, heterosexual in 25% (males: 15%; females: 10%) and unknown in 7%. If cases with unknown transmission category were excluded, 74% of syphilis cases were among MSM. The percentage of cases diagnosed in MSM ranged from 20% or below in Hungary, Latvia, Romania and Slovakia to over 75% in France, Ireland, the Netherlands, Norway, Sweden and Slovenia.

For 2019, information on HIV co-infection status was reported by 16 countries, accounting for 43% of syphilis cases (n=14 962). Of these, 23% were HIV positive (either known or newly diagnosed) and 62% were HIV negative. HIV status was unknown for 15%. Of the MSM cases with known HIV status 34% were HIV positive, which was very similar to 2018 (35%).

Details of the clinical stage of syphilis infection were provided by 13 countries for 39% (n=13 610) of all reported cases in 2019. The majority were reported as 'primary' (34%), 'secondary' (25%) or 'early latent' infection (37%), while a few cases were reported as 'late latent' (1%) or 'latent' syphilis infection (i.e. the duration of the infection was unknown; 2%). Distribution across countries varied. In Estonia, France, Greece, Norway, Portugal, Slovakia and the United Kingdom, more than half of reported cases had primary and/or secondary syphilis. In Czechia, Hungary, Luxembourg and Romania, early latent syphilis cases exceeded those reported as primary and secondary syphilis. Luxembourg (67%) and Slovakia (41%) reported the largest proportions of latent syphilis cases.

### Trends 2010–2019

Between 2010 and 2019, 269 972 cases of syphilis were reported in 30 EU/EEA 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 EU. Lithuania reported zero confirmed cases for 2019. Data reported from Greece for 2019 are provisional.

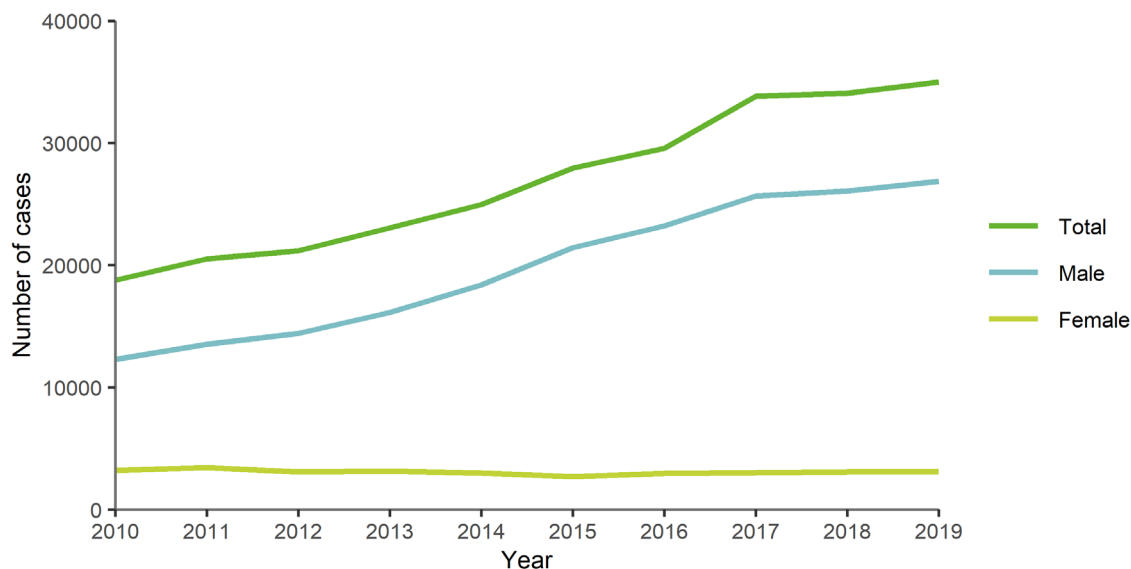
Among countries reporting consistently between 2010 and 2019, reported cases of syphilis infections increased continuously, with the exception of a plateau between 2017 and 2018 (Figure 4). Between 2010 and 2019, trends between genders have diverged, with a marked increase among men and a slow decrease among women.

In 2019, the number of syphilis cases increased by 50% or more (as compared with 2018) in three countries (Iceland, Ireland and Portugal). These three countries together accounted for only 3% of all cases. Changes between -15% and +15% were observed in 12 countries (Bulgaria, Czechia, Denmark, Germany, Greece, Malta, Norway, Poland, Slovenia, Spain, Sweden and the United Kingdom) that together accounted for the majority (73%) of cases in 2019.

In the past 10 years, age-specific rates have constantly been higher among the 25–44-year age groups and between 2010 and 2019 they almost doubled among those aged 35–44 years (+97%) and 25–34 years (+94%). The proportion of cases in the age groups below 45 years decreased or remained stable, while the proportion of among those aged 45 years and above increased from 24% to 31%.

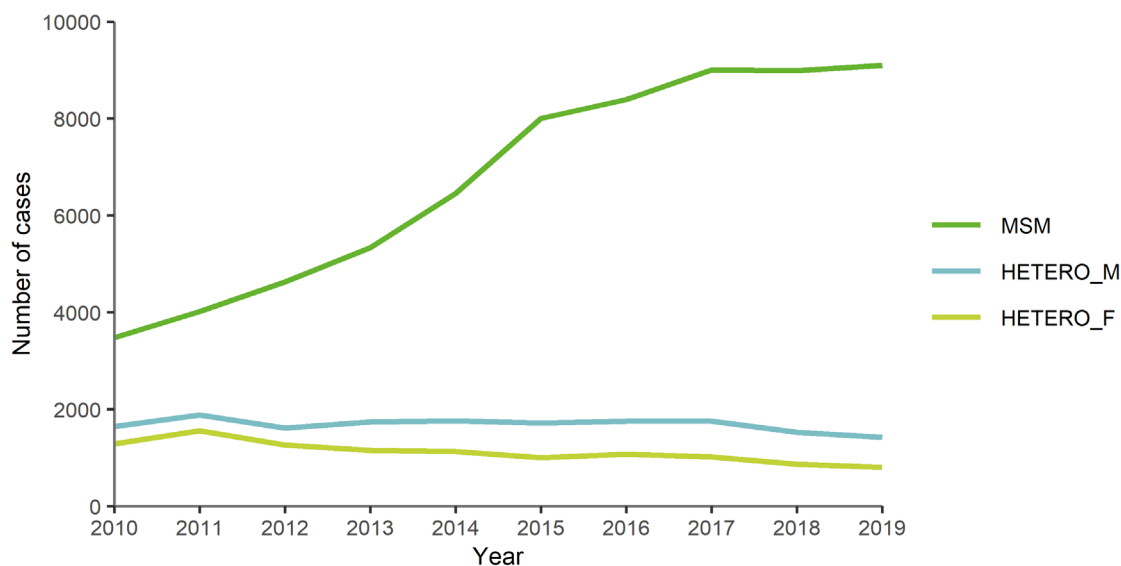
In countries that provided transmission category data for the period 2010–2019, trends by transmission group show a steep increase in reported cases among MSM up to 2017, which then slowed down between 2018 and 2019 (Figure 5). There were very small fluctuations in the number of cases among heterosexuals, with a decreasing tendency in recent years.

**Figure 4. Number of confirmed syphilis cases by gender and year in EU/EEA countries reporting consistently, 2010–2019**



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

**Figure 5. Number of confirmed syphilis cases by gender, transmission category and year in EU/EEA countries reporting consistently, 2010–2019**



Note: HETERO\_M: heterosexual male; HETERO\_F: heterosexual female

Source: Country reports from Czechia, France, Germany, Greece, Ireland, Latvia, the Netherlands, Norway, Romania, Slovenia, Sweden.

## Discussion

During the period 2010–2019, about 270 000 syphilis cases were reported in the EU/EEA. The number of annual notifications increased steeply between 2010 and 2017 and appears to have slowed down in 2018 and 2019. The increase has mainly been among men, particularly MSM, who have been disproportionately affected by the epidemic during this period.

Several factors have been associated with intensified transmission of syphilis among MSM during the period 2010–2017. For example, an increase in high-risk sexual behaviour; serosorting among HIV-positive MSM; an increase in the number of sexual partners in HIV-negative MSM, and more recently, the impact of pre-exposure prophylaxis (PrEP) for HIV on risk compensation [7]. The use of social networking sites or mobile device applications to find sexual partners has also been linked to syphilis outbreaks among MSM [7].

More than one third (34%) of the MSM cases in 2019 were HIV positive. A higher risk-taking sexual behaviour (e.g. more anonymous sex contacts, more condomless anal sex, group sex, drug-use before or during sex) was associated with the high frequency of syphilis in this group [8–10]. The number of syphilis cases among MSM with HIV-negative status continued to increase in 2019. An increased incidence of syphilis and other sexually transmitted infections (STIs) has been observed among HIV-negative MSM after PrEP enrolment, explained by higher-risk sexual behaviour triggered by a decrease in perceived risk, and enhanced STI screening [11,12].

In 2019, syphilis notifications among the heterosexual populations of the EU/EEA remained at a low level, in contrast to increases observed in non-European high-income countries (e.g. Canada, USA, Japan). In European settings, factors associated with heterosexual transmission are high-risk sexual behaviour, sex work, substance use (drug or alcohol) and social vulnerabilities such as poverty, homelessness, or ethnic-minority/migrant/refugee status [7].

In 2019, rates of syphilis infections among women remained low. Given the potentially devastating consequences of syphilis during pregnancy, it is important to monitor syphilis trends among women while ensuring that antenatal screening programmes are implemented effectively, and retesting for syphilis is offered to women at higher risk of infection during the third trimester (weeks 28–32) [7].

Cases have been diagnosed at different stages of the disease, possibly reflecting different access to diagnostic services across Europe and/or awareness of the infection. Updated in 2020, the European guidelines for the management of syphilis include recommendations on which patient groups to prioritise for testing, clinical and laboratory diagnosis and details of treatment regimens [2].

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

## Public health implications

In 2019, as a result of the increasing incidence of syphilis in the EU/EEA and at the request of the Member States, ECDC published a comprehensive analysis of epidemiological trends 2007–2018, formulating options for public health response which remain valid [7].

In general, response activities should consider a combination of case management (diagnosis and treatment), case finding (enhanced screening of populations at risk, expanded testing in outreach venues, partner notification and surveillance activities) and education (directed towards the general population, populations at risk and healthcare providers). More specifically, enhanced testing of populations at risk of syphilis includes offering syphilis testing during routine HIV clinical monitoring for HIV-positive MSM; quarterly testing of the HIV-negative MSM engaging in high-risk sexual practices (i.e. MSM using PrEP, MSM with a high number of sexual partners, MSM with prior syphilis diagnosis) and routine testing of STI clinic attendees. Testing of other risk groups (e.g. ethnic minorities, marginalised populations, sex workers, people who inject drugs) should be informed by syphilis epidemiology in the local area.



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