

SURVEILLANCE REPORT

Syphilis

Annual Epidemiological Report for 2022

Key facts

- In 2022, 35 391 confirmed syphilis cases were reported in 29 EU/EEA Member States, with a crude notification rate of 8.5 cases per 100 000 population, representing a 34% increase in the crude notification rate compared to 2021, and a 41% increase compared to 2018.
- Reported syphilis rates were eight times higher in men than in women and highest in 25–34-year-old men (40 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).
- In 2022, ten countries reported more than half of the cases as primary and/or secondary syphilis, compared to five in 2021.
- Overall, the trend in syphilis notifications increased between 2013 and 2022, mainly due to an increase in the number of cases among MSM. During the same period, there were very small fluctuations in syphilis notifications among heterosexuals at EU/EEA level, however 2022 marks the first year in the last ten with noticeable increases in syphilis among heterosexual men and women.
- In the five years between 2018 and 2022, the number of syphilis notifications in HIV-negative MSM increased by 59% (in the seven countries that reported consistently), continuing the increasing trend observed since 2015.

Introduction

Syphilis is a sexually transmitted infection caused by the bacterium *Treponema pallidum* [1]. It can also be transmitted from the mother to the 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) at the site of infection occurs (primary syphilis), followed by a series of eruptions on mucous membranes and skin (secondary syphilis). Untreated infection can become latent, early latent syphilis (acquired < 1 year) and late latent (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 following unprotected sexual contact are possible.

Methods

This report is based on data for 2022 retrieved from The European Surveillance System (TESSy) on 11 January 2024. 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's 'Annual Epidemiological Report 2022' [3].

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

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

For 2022, the majority of countries (21/29) reported data using the standard EU case definitions [6]. Six countries reported using national case definitions and two countries did not state which case definition was in use.

Most countries (26) had comprehensive surveillance systems. Three countries (Belgium, France and the Netherlands) reported data derived from sentinel systems that only captured syphilis diagnoses from a selection of healthcare providers. Reporting of syphilis infection is compulsory in 26 countries and voluntary in the three countries with sentinel systems.

Data from sentinel surveillance systems were not used in the calculation of national or overall rates because coverage was not always known and denominators were therefore not available. Data from sentinel systems were included in the descriptive analysis. Cases are analysed by date of diagnosis.

Some countries did not provide information on infection stages and therefore all reported syphilis cases are considered for the analysis, irrespective of the stage of infection. As a result, some cases of non-infectious syphilis (late latent syphilis, acquired > 1 year ago) might be included for some countries even though they are not under EU/EEA surveillance.

The United Kingdom (UK) contributed surveillance data up to 2019. No data were reported by the UK for 2020 or subsequent years due to its withdrawal from the EU on 31 January 2020. The UK data that were reported up to 2019 are presented in Table 1, but are not included in the analysis of trends.

Epidemiology

Geographic distribution

In 2022, 35 391 confirmed syphilis cases were reported in 29 EU/EEA countries, giving a crude notification rate of 8.5 cases per 100 000 population (Table 1) for countries with comprehensive surveillance systems. The highest rate was observed in Malta (24.4 cases per 100 000 population), followed by Luxembourg (23.4), Ireland (16.6), Spain (16.6), Liechtenstein (15.3), Portugal (14.8), Iceland (13.3), Denmark (11.5) and Hungary (11.0). Low rates of under three cases per 100 000 population were observed in Croatia, Estonia, Latvia, Romania and Slovenia (Table 1, Figure 1).

Table 1. Confirmed syphilis cases and rates per 100 000 population by country and year, EU/EEA, 2018–2022

Country	2018		2019		2020		2021		2022	
	Number	Rate								
Austria	NDR	NRC								
Belgium	1 901	NRC	1 670	NRC	1 407	NRC	2 113	NRC	2 191	NRC
Bulgaria	485	6.9	480	6.9	319	4.6	271	3.9	361	5.3
Croatia	35	0.9	28	0.7	22	0.5	35	0.9	48	1.2
Cyprus	44	5.1	31	3.5	43	4.8	92	10.3	71	7.8
Czechia	596	5.6	630	5.9	716	6.7	758	7.2	801	7.6
Denmark	322	5.6	361	6.2	445	7.6	638	10.9	677	11.5
Estonia	27	2.0	37	2.8	33	2.5	31	2.3	39	2.9
Finland	181	3.3	251	4.5	207	3.7	168	3.0	387	7.0
France	1 606	NRC	1 080	NRC	982	NRC	1 285	NRC	1 761	NRC
Germany	7 367	8.9	7 928	9.5	7 404	8.9	6 744	8.1	8 301	10.0
Greece	389	3.6	443	4.1	401	3.7	654	6.1	864	8.3
Hungary	675	6.9	788	8.1	774	7.9	764	7.9	1 062	11.0
Iceland	22	6.3	38	10.6	31	8.5	50	13.6	50	13.3
Ireland	485	10.0	745	15.2	581	11.7	718	14.3	839	16.6
Italy	1 526	2.5	1 826	3.1	843	1.4	1 614	2.7	2 540	4.3
Latvia	104	5.4	75	3.9	68	3.6	48	2.5	27	1.4
Liechtenstein	NDR	NRC	NDR	NRC	4	10.3	1	2.6	6	15.3
Lithuania	130	4.6	117	4.2	54	1.9	117	4.2	86	3.1
Luxembourg	104	17.3	51	8.3	199	31.8	185	29.1	151	23.4
Malta	85	17.9	95	19.2	85	16.5	166	32.2	127	24.4
Netherlands	1 355	NRC	1 474	NRC	1 526	NRC	1 684	NRC	1 925	NRC
Norway	231	4.4	205	3.8	287	5.3	163	3.0	195	3.6
Poland	1 445	3.8	1 627	4.3	711	1.9	1 127	3.0	1 992	5.3
Portugal	255	2.5	480	4.7	869	8.4	1 144	11.1	1 534	14.8
Romania	638	3.3	539	2.8	296	1.5	318	1.7	493	2.6
Slovakia	433	8.0	278	5.1	160	2.9	289	5.3	426	7.8
Slovenia	52	2.5	54	2.6	31	1.5	37	1.8	34	1.6
Spain	4 826	10.3	4 880	10.4	4 531	9.6	5 277	11.1	7 868	16.6
Sweden	479	4.7	431	4.2	473	4.6	583	5.6	535	5.1
EU/EEA (30 countries)	25 798	6.0	26 642	6.5	23 502	5.6	27 074	6.3	35 391	8.5
United Kingdom	8 328	12.6	8 738	13.1	NDR	NRC	NA	NA	NA	NA
EU/EEA (31 countries)	34 126	7.1	35 380	7.5	23 502	5.6	NA	NA	NA	NA

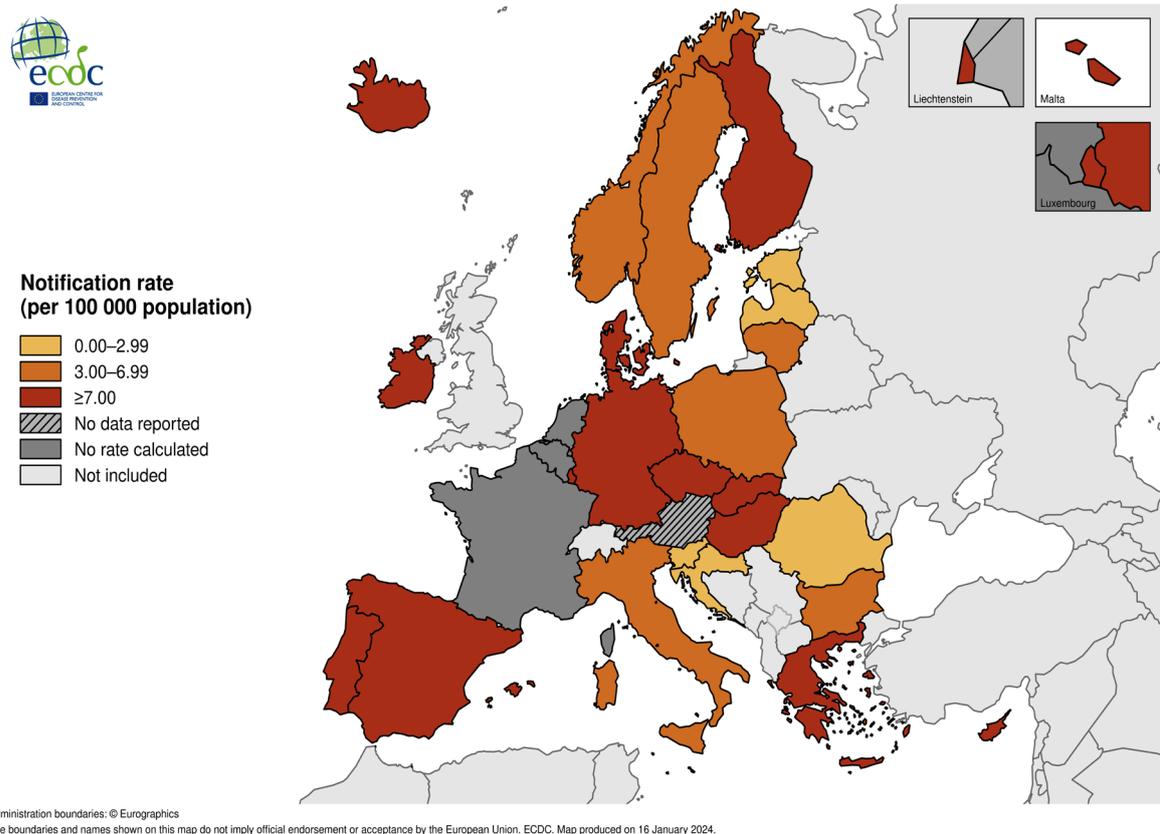
Source: country reports.

NDR: no data reported. NRC: no rate calculated. NA: not applicable.

No data were reported by the United Kingdom from 2020 onwards due to its withdrawal from the EU on 31 January 2020.

Rates for Belgium, France and the Netherlands were not calculated as data reported since they are based on sentinel systems where population denominators were unknown.

Note: cases with unknown classification are not presented in the table or included in the analysis. There were changes in surveillance system configuration and coverage in France between 2019 and 2020. In Luxembourg the surveillance system for syphilis reporting changed in 2020, and therefore the data from 2020 onwards should not be compared with data from previous years.

Figure 1. Confirmed syphilis cases per 100 000 population by country, EU/EEA, 2022

Rates are calculated for countries with comprehensive STI surveillance that reported data for 2022.

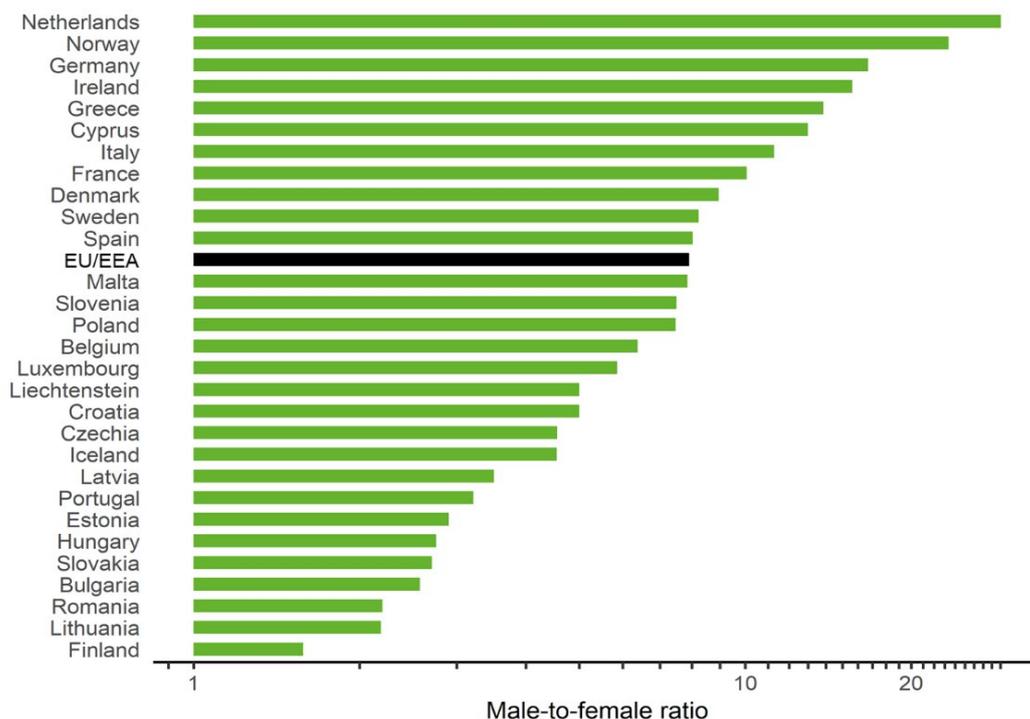
Gender

The overall male-to-female ratio in 2022 was 7.9:1, with rates of 15.3 cases per 100 000 population in men (31 217 cases) and 1.9 cases per 100 000 population in women (3 945 cases). There were 88 cases reported as 'other' gender and 141 where gender was unknown.

In 2022, the highest rates among men (above 15 cases per 100 000 population) were observed in Denmark, Germany, Greece, Hungary, Iceland, Ireland, Liechtenstein, Luxembourg, Malta, Portugal and Spain. Rates among women were highest (above three cases per 100 000 population) in Finland, Hungary, Iceland, Liechtenstein, Luxembourg, Malta, Portugal, Slovakia and Spain.

There were marked differences in the male-to-female ratios across countries: ratios of or above 10:1 were reported by Cyprus, France, Germany, Greece, Ireland, Italy, the Netherlands and Norway, while male-to-female ratios below 3:1 were reported by Bulgaria, Estonia, Finland, Hungary, Lithuania, Romania and Slovakia (Figure 2).

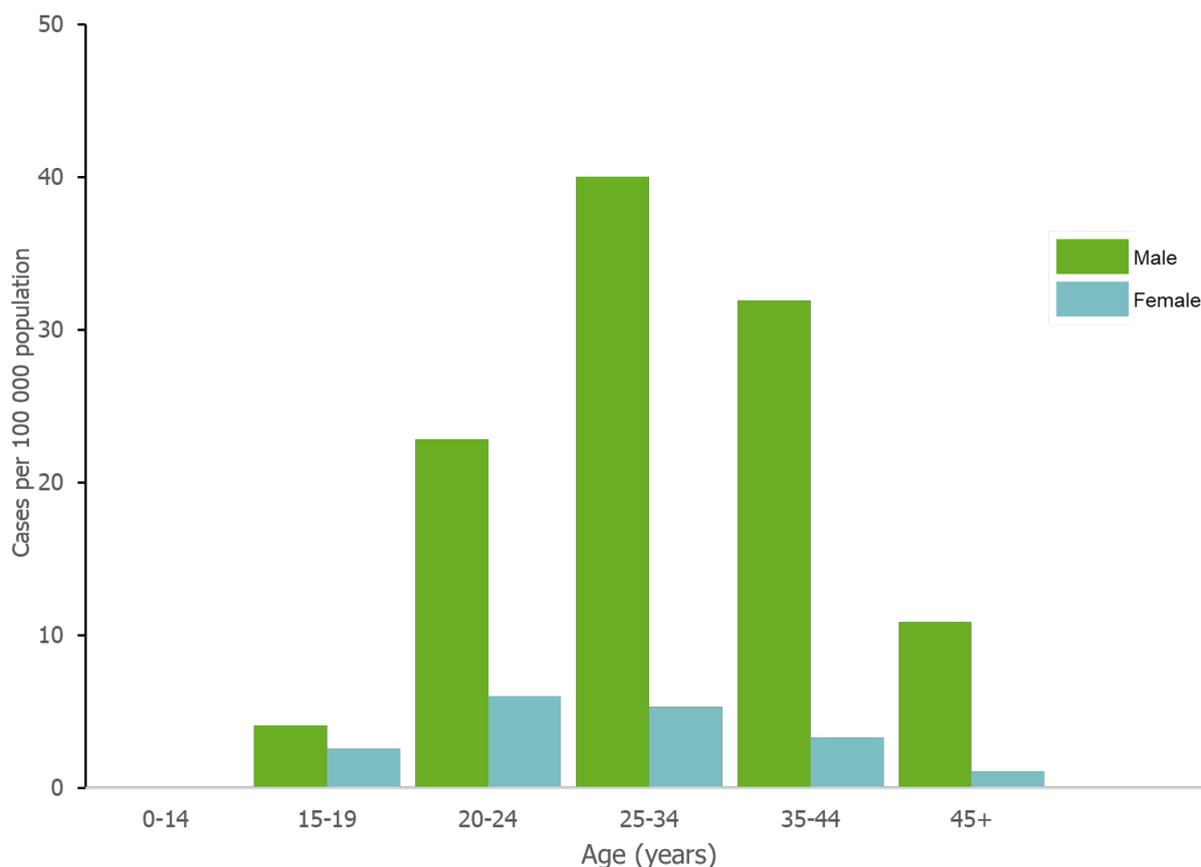
Figure 2. Male-to-female ratios of syphilis cases by country, EU/EEA, 2022



Age

In 2022, information on age was available for cases reported from 26 countries. Information was either unavailable or reported in a format that was unsuitable for analysis for Belgium, Bulgaria and Poland, accounting for 13% of all cases. In 2022, the largest proportion of cases was reported in two population groups: 25–34-year-olds and those aged 45 years or older. These two age groups accounted for 31% and 32% of all cases respectively. Adults aged 35–44 years accounted for 26% of cases, and young people aged 15–24 years accounted for 11% of all reported cases. When the 15–24 years age group is further subdivided, individuals aged 20–24 years accounted for 9%, and those aged 15–19 years accounted for 2% 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 those aged 25–34 years (40 cases per 100 000 population), followed by those aged 35–44 years (32 per 100 000) and those aged 20–24 years (23 per 100 000 population). Between 2021 and 2022, these age groups saw increases of 51%, 48% and 41%, respectively. Women aged between 20–24 years had the highest age-specific rate (six cases per 100 000 population) followed by women aged 25–34 years, with five cases per 100 000 population and women aged 35–44 (three cases per 100 000 population). Between 2021 and 2022, these age groups saw an increase of 50%, 48% and 63%, respectively.

Figure 3. Confirmed syphilis cases per 100 000 population, by age and gender, EU/EEA, 2022

Source: Country reports from countries with comprehensive surveillance Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.

Transmission, HIV status and syphilis stage

For 2022, 19 countries reported information on transmission category for more than 60% of their cases. They accounted for 56% (n=19 732) of all reported syphilis cases. Among these cases, transmission category was indicated as MSM in 59%, heterosexual in 21% (males: 13%; females: 8%) and unknown in 20%. When cases with unknown transmission category were excluded, 74% of syphilis cases were among MSM, and 16% and 10% were attributed to heterosexual transmission in males and females, respectively. The percentage of cases diagnosed in MSM ranged from 31% or less in Hungary, Lithuania, Romania and Slovakia to 75% or more in Denmark, Germany, Greece, Ireland, the Netherlands, Norway and Sweden.

For 2022, information on HIV co-infection status was reported by 12 countries, accounting for 47% of syphilis cases (n=16 467). Of these, 9% were HIV positive (either known or newly diagnosed) and 34% were HIV negative. HIV status was unknown for 56%. Of the MSM cases with known HIV status, 26% were HIV positive. Between 2018 and 2022, the number of syphilis notifications in MSM with HIV negative status increased by 59% (in the seven countries that consistently reported information on HIV status and sexual orientation).

Details on the clinical stage of syphilis infection were provided by 15 countries for 27% (n=9 382) of all reported cases in 2022. The majority were reported as 'primary' (32%), 'secondary' (25%) or 'early latent' infection (32%), while fewer cases were reported as 'late latent' (6%) or 'latent' syphilis infection (5%). Distribution across countries varied. Ten countries (Czechia, France, Greece, Hungary, Latvia, Liechtenstein, Norway, Portugal, Slovenia and Spain) reported more than half of their cases as primary and/or secondary syphilis. In one country, Cyprus, early latent syphilis cases exceeded those reported as primary and/or secondary syphilis. For comparison, in 2021, five countries reported more than 50% of their cases as primary and/or secondary syphilis and in four countries, early latent syphilis cases surpassed those reported as primary and/or secondary syphilis.

Trends 2013–2022

Between 2013 and 2022, 250 330 cases of syphilis were reported in 30 EU/EEA countries. During this period, 28 countries consistently reported data, while Austria reported data for 2013 and Liechtenstein reported data for 2020–2022. An additional 45 630 cases were reported by the UK for the period 2013–2019, before its withdrawal from the European Union on 31 January 2020.

When considering cases from countries with comprehensive surveillance that reported consistently between 2013 and 2022, notification rates of syphilis infections per 100 000 population increased continuously until 2019, before decreasing in 2020, and then increasing again in 2021, to reach an all-time-high in 2022 (Figure 4). Between 2013 and 2019, trends between genders have been divergent, with a marked increase among men and a slow decrease among women in the earlier part of the period, followed by further increases more recently. Looking at the change in rates for the last five years in countries reporting consistently¹, overall rates have increased by 41%, from 6.0 in 2018 to 8.5 per 100 000 population in 2022. Among men, rates increased by 36% (from 9.5 to 13.0 per 100 000 population) and among women by 24% (from 1.4 to 1.7 per 100 000 population) between 2018 and 2022.

In 2022, (compared with 2021), of the 29 countries that reported data, the number of syphilis cases increased in 21, remained the same in one and decreased in seven. Increases by 25% or more were observed in Bulgaria, Croatia, Estonia, Finland, France, Greece, Hungary, Italy, Liechtenstein, Poland, Portugal, Romania, Slovakia and Spain – countries that together accounted for 55% of all cases in 2022. Increases of less than 25% were observed in Belgium, Czechia, Denmark, Germany, Iceland, Ireland, the Netherlands and Norway – countries that reported 42% of all cases in 2022. Decreases were observed in Cyprus, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Sweden; seven countries that accounted for 3% of syphilis cases in 2022. Among the 28 countries that reported cases both in 2022 and 2019, 22 showed an increase in reported cases in 2022 compared to pre-COVID-19 pandemic levels. For six countries (Bulgaria, Latvia, Lithuania, Norway, Romania and Slovenia), the number of cases in 2022 remained below the number reported in 2019.

Over the past 10 years, age-specific rates have consistently been highest among those in the age group 25–44 years, and increased by more than 80% in those aged 25–34 years (+87%) and those aged 35–44 years (+85%) between 2013 and 2022.

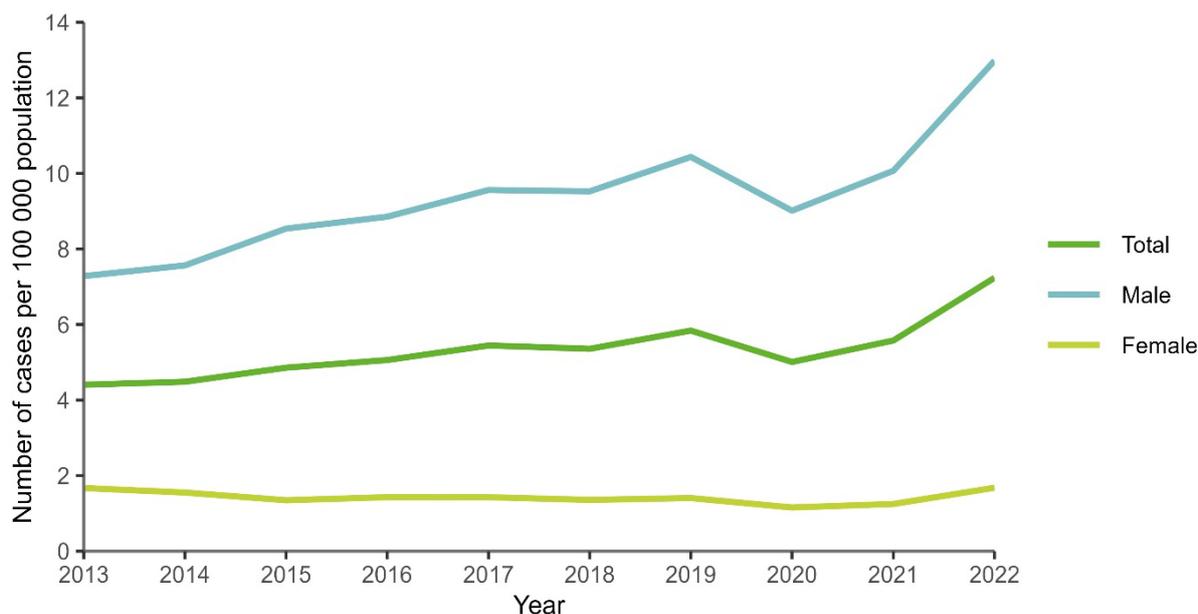
Trends by transmission group (Figure 5) in 10 countries that provided transmission category data with at least 60% completeness for 2013–2022 show a steep increase in reported cases among MSM until 2019, followed by a decrease in 2020 and a rebound in 2022. There were very small fluctuations in the number of cases among heterosexuals, with a decreasing tendency between 2013 and 2020. In 2022, upsurges can be observed in both the number of cases among heterosexual males and heterosexual females.

Looking at trends over the last five years, 13 countries provided transmission category data with at least 60% completeness for 2018–2022². Cases increased by 31% among MSM, 32% among those reported as heterosexual female and 29% among those reported as heterosexual male.

¹ Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, and Sweden. Data from Spain are included in the 'total' but not in the gender-specific rates because data on gender was not consistently reported by Spain over the past 10 years.

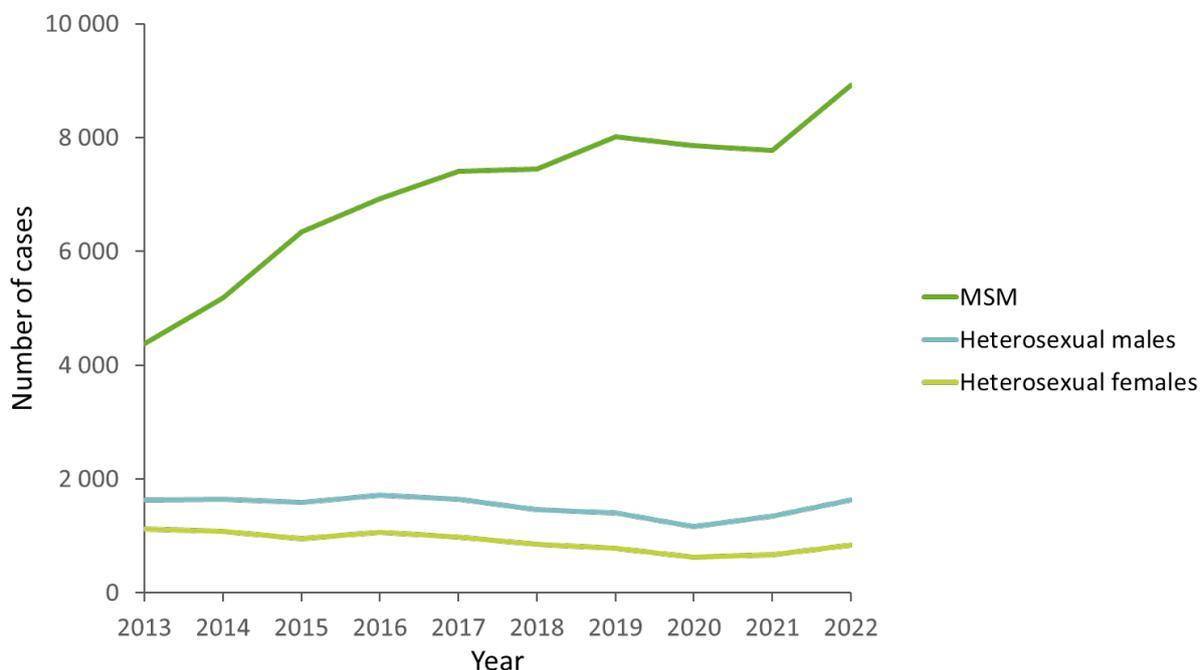
² Czechia, Denmark, Germany, Greece, Hungary, Latvia, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, and Sweden

Figure 4. Rate of confirmed syphilis cases per 100 000 population, total and by gender for cases with available data, EU/EEA countries reporting consistently, 2013–2022



Source: country reports from Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, and Sweden.

Figure 5. Number of confirmed syphilis cases by gender, transmission category and year in EU/EEA countries reporting consistently, 2013–2022



Source: country reports from Czechia, Germany, Greece, Latvia, the Netherlands, Norway, Romania, Slovakia, Slovenia, and Sweden.

Outbreaks and other threats

In addition to reporting to TESSy, the EU/EEA Member States can timely report events and threats of public health significance for the EU/EEA through the ECDC platform EpiPulse [7]. There were no alerts or events related to syphilis posted in 2022.

Discussion

Between 2013–2022 about 250 000 syphilis cases were reported in the EU/EEA. The number of annual notifications increased continuously between 2013 and 2019 and decreased in 2020. The decrease in 2020 was associated with the COVID-19 pandemic's impact on availability and/or access to STI care services, reduced testing opportunities and decrease of STI surveillance capacity due to diversion of resources to the COVID-19 response (internal ECDC report, data not published). The recovery of STI care services, including testing, and surveillance capacities may explain the rebound in case notifications for 2021. In addition to restored STI services and optimised surveillance, increased transmission may explain the rise in syphilis notifications across all transmission groups, including heterosexual women, in 2022.

Men, particularly MSM, have been disproportionately affected by the epidemic over the last decade. Factors contributing to the increasing incidence of syphilis among MSM, identified based on self-reported behaviour data collected through two EMIS surveys (in 2010 and 2017), were living with HIV; larger number of non-steady male condomless anal intercourse (CAI) partners; recency of STI screening; selling sex and use of pre-exposure prophylaxis (PrEP) for HIV [8]. For MSM using PrEP, an increased risk of syphilis was associated with recency of STI screening and the number of non-steady male CAI partners. Regular testing for syphilis (and other STIs) among those on PrEP is recommended by the International Union Against Sexually Transmitted Infections (IUSTI) Europe and the European AIDS Clinical Society (EACS) guidelines [2,9]. Pioneering this recommendation, the 2020 IUSTI Europe guidelines on the management of syphilis advised clinicians to consider doxycycline prophylaxis for populations at high risk of acquiring syphilis [2]. When implemented, doxy-PEP should be part of a comprehensive package of sexual health interventions, including regular screening and provision of treatment where needed, along with close monitoring for individual and population-level antimicrobial resistance [10].

In 2022, syphilis notifications increased among both heterosexual men and heterosexual women in the EU/EEA, after a period of very minor fluctuations during 2013–2021. In European settings, factors associated with heterosexual transmission are high-risk sexual behaviour, sex work, substance use (drugs or alcohol) and social vulnerabilities such as poverty, homelessness, ethnic minority, migrant or refugee status [11].

Rates of syphilis infections among women increased in 2022. Data indicate that most women diagnosed with syphilis are between 20 and 34 years old, which is within the reproductive age range. Given the potentially devastating consequences of syphilis during pregnancy, it is important to monitor syphilis trends among women while at the same time ensuring that antenatal screening programmes are implemented effectively and that retesting for syphilis during the third trimester (weeks 28–32) is offered to women at higher risk of infection [11]. Among 14 countries reporting increases by 25% or more in the overall number of syphilis cases in 2022, ten (Bulgaria, Croatia, France, Hungary, Italy, Poland, Portugal, Romania, Slovakia and Spain) also reported congenital syphilis cases in 2022. More details on congenital syphilis in the EU/EEA are provided in the Annual Epidemiological Report on congenital syphilis for 2022 [12].

In 2022, the number of countries reporting more than half of their cases as primary and/or secondary syphilis increased to ten from five in 2021. While this may reflect an expansion in availability and early access to testing, it may also indicate increased transmission across Europe. Updated in 2020, the 'European guideline for the management of syphilis' includes 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. By way of example, changes in France's surveillance system between 2019 and 2020 place a limitation on the interpretation of trends.

Public health implications

Following the increasing trends of syphilis in the EU/EEA and by request of Member States, ECDC formulated options for public health response which remain valid [11].

In general, response activities should consider a combination of case finding (enhanced screening of populations at risk, expanded testing in outreach venues, partner notification and surveillance activities), case management (diagnosis and treatment), and education (directed at 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 HIV-negative MSM engaging in

high-risk sexual practices (i.e. MSM using PrEP, MSM with a high number of sex partners, MSM with prior syphilis diagnosis), and routine testing of those attending STI clinics. Testing of other risk groups (e.g. marginalised populations, sex workers, people who inject drugs) should be informed by local syphilis epidemiology. In light of the recent increases in syphilis notifications among women of reproductive age, it is essential that national antenatal screening programmes are strengthened, along with the control of syphilis transmission, among heterosexual populations.

Further development of syphilis surveillance at the European level needs to consider current limitations. Starting in 2024, ECDC will engage the STI network in revision of the STI surveillance objectives, agree on updated general and disease-specific objectives, and develop surveillance standards specific to each STI under EU/EEA surveillance.

The fourth edition of the Laboratory and point-of-care diagnostic testing for STIs including HIV was published by the World Health Organization in 2023 [13]. This manual was accompanied by the Diagnostics Landscape for Sexually Transmitted Infections which highlights the diagnostics available as of 2023 [14].

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