

## SURVEILLANCE REPORT

### Annual Epidemiological Report for 2021

# Chlamydia

## Key facts

- For 2021, 27 EU/EEA Member States reported 184 542 confirmed cases of chlamydia infection.
- The crude notification rate was 74 cases per 100 000 population.
- National notification rates for cases of chlamydia infection varied considerably across the EU/EEA. This is a probable reflection of the differences in chlamydia testing, case finding strategies and reporting rather than actual epidemiological differences in chlamydia distribution.
- Notification rates continue to be highest among young adult heterosexual women.
- Notification rates increased from 2012 to 2019, but decreased in 2020 and 2021, probably due to decreased health seeking and testing during the COVID-19 pandemic in combination with reductions in risk behaviours during this period.

## Introduction

Chlamydia is a sexually transmitted infection caused by the *Chlamydia trachomatis* bacterium. Genital infections present as urethritis and proctitis in men and women, cervicitis, salpingitis, endometritis and pelvic inflammatory disease (PID) in women, and orchitis, epididymitis and prostatitis in men. Many infections are asymptomatic resulting in delayed diagnosis and uninterrupted transmission [1].

## Methods

This report is based on data for 2021 retrieved from The European Surveillance System (TESSy) on 3 April 2023. 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* of the 'ECDC Annual Epidemiological Report' [2].

An overview of the national surveillance systems is available at the ECDC website [3].

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A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [4].

In 2019, more than two-thirds of countries (21) reported data based on the standard EU case definitions [5]. Four countries reported data based on national case definitions and two countries did not report which case definition they used [3]. Surveillance systems for chlamydia in Europe vary: 23 countries have comprehensive surveillance systems and four have sentinel systems that only capture chlamydia diagnoses from a selection of healthcare providers. Reporting of cases of chlamydia infection is compulsory in the countries that maintain a comprehensive surveillance system, while it is voluntary in countries that maintain a sentinel system. Data from sentinel systems are not included in the calculation of rates as the population coverage is unknown and denominators are therefore not available. Cases are analysed by date of diagnosis. The use of incompatible age formats meant that data from the following countries and years were excluded from the analysis of age groups: Belgium (2015–2021), Croatia (2012), and Poland (2012–2021). Surveillance data on chlamydia were not available from Austria, Czechia, and Germany for 2012–2021, for Liechtenstein for 2012–2019, from France for 2018–2020 and from Portugal 2012–2013.

The United Kingdom (UK) contributed surveillance data up to 2019. Data are no longer reported by the UK for 2020 or 2021 due to its withdrawal from the EU on 31 January 2020. The UK data that were reported up to 2019 are not included in the analysis of trends.

## Epidemiology

In 2021, 27 countries reported 184 542 confirmed chlamydia cases (Table 1). The crude notification rate for the 23 EU/EEA countries with comprehensive surveillance systems was 74 per 100 000 population.

Notification rates of cases of chlamydia infection varied considerably across the EU/EEA (Table 1). The highest country-specific rates of over 250 cases per 100 000 population were in Denmark, Finland, Iceland, Norway and Sweden – countries that together reported 61% of chlamydia cases in 2021. Lowest rates of less than three cases per 100 000 population were reported by Bulgaria, Croatia, Cyprus, Greece, Poland and Romania.

**Table 1. Distribution of confirmed cases of chlamydia infection and rates per 100 000 population by country and year, EU/EEA, 2017–2021**

Country	2017		2018		2019		2020		2021	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Belgium	8 093	NRC	9 294	NRC	8 288	NRC	5 692	NRC	8 665	NRC
Bulgaria	230	3.2	189	2.7	121	1.7	50	0.7	31	0.4
Croatia	194	4.7	213	5.2	150	3.7	121	3.0	115	2.8
Cyprus	1	0.1	3	0.3	1	0.1	4	0.5	5	0.6
Czechia	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Denmark	32 932	572.9	33 415	578.0	35 680	614.5	34 681	595.6	36 632	627.3
Estonia	1132	86.0	1013	76.8	1064	80.3	942	70.9	964	72.5
Finland	14 462	262.8	14 839	269.2	16 181	293.2	16 280	294.6	16 789	303.4
France	17 672	NRC	NDR	NRC	NDR	NRC	NDR	NRC	12 665	NRC
Germany	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Greece	85	0.8	61	0.6	62	0.6	66	0.6	45	0.4
Hungary	923	9.4	780	8.0	913	9.3	624	6.4	640	6.6
Iceland	2 197	649.3	1 834	526.3	1 795	502.8	1 788	491.0	1 807	490.0
Ireland	7 390	154.5	7 933	164.2	9 206	187.7	6 901	139.0	7 207	144.0
Italy	600	NRC	1 198	NRC	1 109	NRC	604	NRC	1 244	NRC
Latvia	1 517	77.8	1 248	64.5	1 249	65.1	1 194	62.6	804	42.5
Liechtenstein	NDR	NRC	NDR	NRC	NDR	NRC	30	77.4	33	84.5
Lithuania	397	13.9	257	9.1	248	8.9	174	6.2	228	8.2
Luxembourg	39	6.6	36	6.0	44	7.2	1 003	160.2	1 136	179.0
Malta	293	63.7	343	72.1	320	64.8	235	45.7	362	70.1
Netherlands	21 444	NRC	18 908	NRC	18 148	NRC	16 109	NRC	20 484	NRC
Norway	25 130	477.9	26 556	501.5	28 446	533.9	25 444	474.0	23 447	434.9
Poland	258	0.7	308	0.8	418	1.1	167	0.4	283	0.7
Portugal	333	3.2	613	6.0	787	7.7	764	7.4	874	8.5
Romania	20	0.1	9	0.0	14	0.1	5	0.0	4	0.0
Slovakia	613	11.3	526	9.7	780	14.3	682	12.5	885	16.2
Slovenia	266	12.9	332	16.1	397	19.1	280	13.4	369	17.5
Spain	9 478	23.6	12 847	31.9	15 612	38.5	15 254	36.0	18 653	43.9
Sweden	34 298	343.1	31 815	314.4	34 784	340.0	32 890	318.5	30 171	290.7
UK	230 482	350.0	242 386	365.7	258 904	388.5	NDR	NRC	NDR	NRC
<b>EU/EEA</b>	<b>410 479</b>	<b>140.5</b>	<b>406 956</b>	<b>146.1</b>	<b>434 721</b>	<b>157.2</b>	<b>161 984</b>	<b>72.7</b>	<b>184 542</b>	<b>73.9</b>

Source: Country reports.

NDR: no data reported.

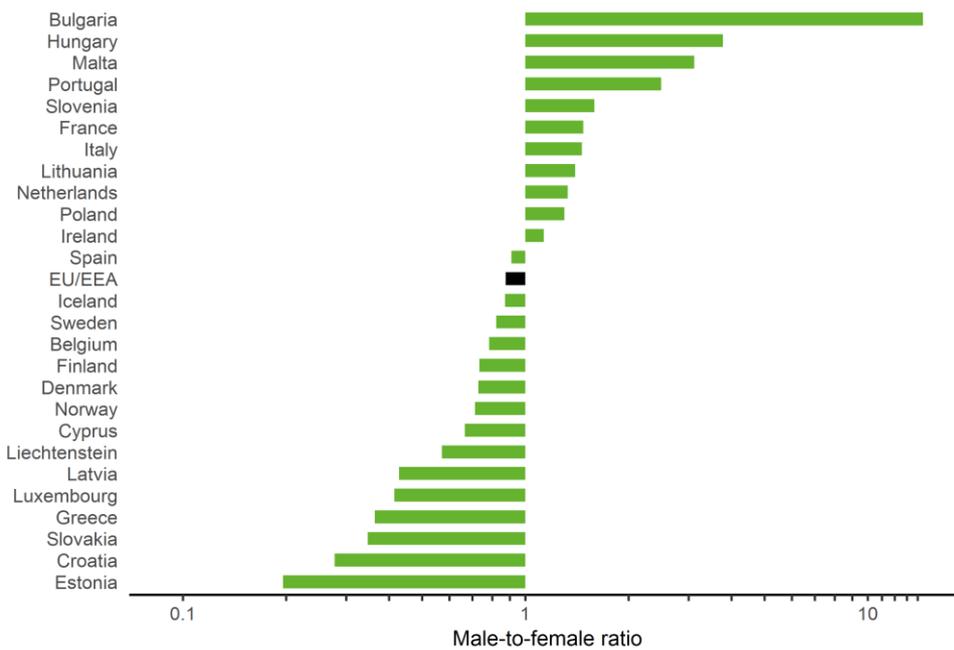
NRC: no rate calculated.

Rates for Belgium, France, Italy and the Netherlands were not calculated, as the reported data were from sentinel systems where population denominators were not known.

## Gender

Data on gender were reported for 184 143 cases (99.7% of all confirmed cases). The overall male-to-female ratio in 2021 was 0.9 (Figure 1), with 85 984 cases reported in men, compared with 98 006 cases among women. In total, 153 cases were reported with gender 'Other'. Among countries with comprehensive surveillance systems, the overall notification rate was 67 per 100 000 in men and 80 per 100 000 in women. The male-to-female ratios were below or close to one in most countries. Male-to-female ratios of 2.0 or above were reported from five countries with comprehensive systems: Bulgaria (14.5), Hungary (3.8), Malta (3.1), and Portugal (2.5). These countries report relatively low notification rates. The lowest male-to-female ratio was observed in Estonia (0.2).

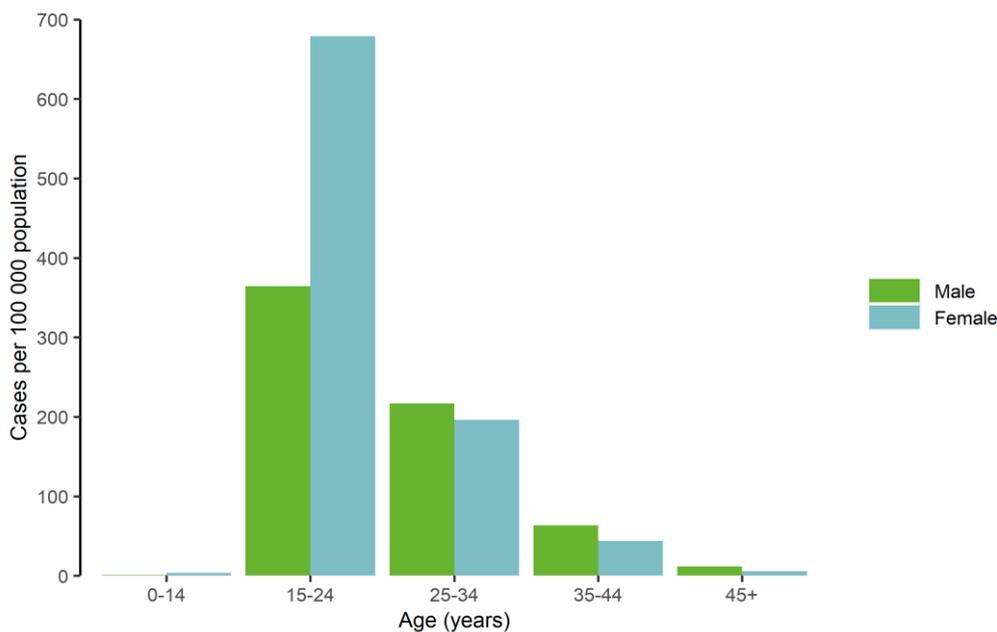
**Figure 1. Male-to-female ratio for chlamydia in EU/EEA countries, 2021**



## Age

In 2021, information on age was available for 175 557 (95%) cases. The largest proportion of cases reported in 2021 were among 15–24-year-olds, who accounted for 60% of cases with known age. The second-largest group was the age group 25–34 years, accounting for 27% of cases, while people older than 34 years accounted for 13% of cases with known age. This pattern was also reflected in age-specific notification rates (Figure 2). The highest rates for 2021 were seen in the 15–24-year age group, with 517 cases per 100 000 reported by countries with comprehensive systems, followed by the 25–34-year-olds age group with 207 cases per 100 000 population. The highest rates by age and gender were reported among both women and men in the age groups 15–24 years, with 679 cases per 100 000 population among women and 365 per 100 000 population for men. Rates among men aged 25 years or over were higher than among women of the same age-group.

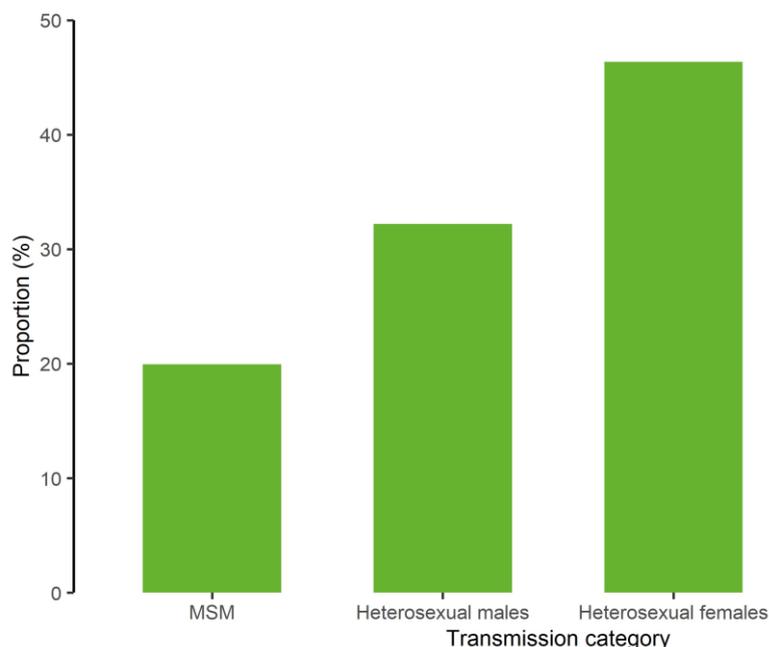
**Figure 2. Confirmed cases of chlamydia infection per 100 000 population, by age and gender, EU/EEA, 2021**



## Transmission

In 2021, information on transmission category was available for 35% of all reported cases of chlamydia infection (n=64 366). The main reason for the relatively low completeness for this variable is that countries reporting high numbers of cases (Denmark, Norway, Finland) have laboratory-based surveillance systems that are not linked to clinical surveillance and therefore do not include data on transmission. For the 11 countries that reported transmission category for 60% or more of their cases, information on transmission category was available for 62 257 cases. (34% of all reported cases). Of these cases, 79% were indicated as heterosexual transmission (32% in males and 46% in females), 20% were in men who have sex with men (MSM), 0.05% were reported as mother-to-child transmission and 1.5% were categorised as 'other'.

**Figure 3. Percentage of cases of chlamydia infection by transmission category and gender, EU/EEA, 2021**



Source: Data from countries with at least 60% completeness of transmission category (France, Hungary, Italy, Lithuania, Malta, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Sweden).

## Trends 2012–2021

Between 2012 and 2021, 3 588 872 cases of chlamydia infection were reported from 28 countries. Of these, Liechtenstein only contributed data between 2020–2021, France for 2012–2017 and for 2021, and Portugal for 2014–2021. The UK stopped reporting after 2019 as the country exited the European Union.

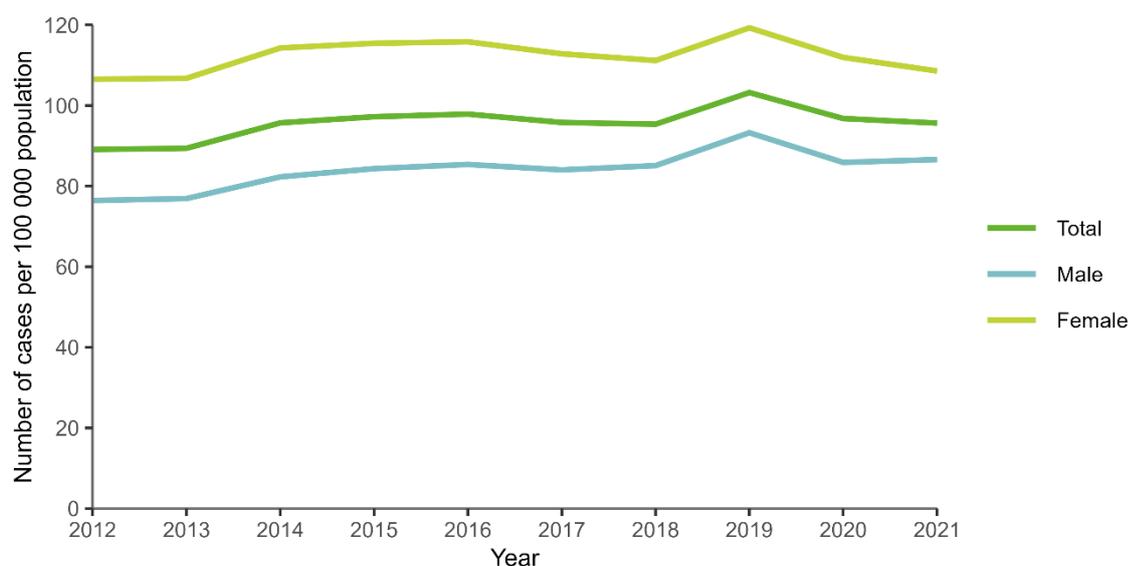
In the 19 countries that reported consistently between 2012–2021, the overall notification rate of reported cases of chlamydia infection increased by 7% from 89 cases per 100 000 population reported in 2012 to 96 cases per 100 000 population reported in 2021 (Figure 4). Throughout this period, chlamydia notification rates have been consistently higher among women (Figure 4).

The notification rate peaked in 2019 for both women (119 cases per 100 000 women) and men (93 cases per 100 000 men). Rates decreased for both genders in 2020 and continued to decrease in 2021 for women. For men, rates in 2021 increased slightly relative to 2020.

Information on transmission status was consistently reported by 11 countries for the period 2017–2021. Among these, the number of cases reported among MSM increased from 5 974 in 2017 to 9 810 in 2021.

Information on HIV status for chlamydia cases reported as MSM transmission was available from five EU/EEA countries (Estonia, Hungary, Italy, the Netherlands and Portugal) for a total of 4 053 cases in 2017 and 6 756 in 2021. For these countries overall, the number of cases among HIV-negative MSM increased by 78% from 3 118 in 2017 to 5 688 in 2021. The number of cases among HIV-positive men increased by 23% from 865 in 2017 to 1 066 in 2021.

**Figure 4. Notification rates of confirmed chlamydia cases per 100 000 population by gender and year in EU/EEA countries reporting consistently, 2012–2021**



Source: Country reports from Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, Greece, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Sweden. The Total category includes all reported cases regardless of whether data on gender was available. No data from Cyprus, Lithuania and Luxembourg are included in the Male and Female categories, as data on gender were not consistently reported during the study period. Cases reported from Belgium, France, Italy and the Netherlands are not included as the reported data were from sentinel systems where population denominators were not known.

## Discussion

In 2021, the overall rate of chlamydia diagnoses reported in the EU/EEA remained high in comparison with other sexually-transmitted infections under surveillance [4], driven mostly by reports from countries with more intensive testing and control activities for chlamydia and complete reporting to surveillance systems [6].

A reason behind the decline from 2019 may be a combination of changes in healthcare seeking behaviours and testing practices during the COVID-19 pandemic. A survey of a wide range of actors involved in the provision of testing services found that the majority reported service disruptions and declines in testing volumes, in particular in the early part of 2020 [7]. These findings are similar to those of an ECDC survey of the STI Network, which found that the decrease in 2020 is most likely due to the impact of the COVID-19 pandemic on availability and/or access to STI care services or populations at high risk, changes in sexual behaviours, reduced testing opportunities and decrease of STI surveillance capacity due to diverting of resources to COVID-19 response (internal ECDC report, data not published).

The large variation in country-specific rates that characterises EU/EEA chlamydia surveillance data is contrasted by a more homogenous distribution of chlamydia prevalence in EU/EEA countries based on prevalence estimates derived from population-based surveys [8] although a comprehensive review of more recent estimates at EU/EEA level is needed. Differences in notification rates across EU/EEA are a reflection of the extent of access to diagnostics, differences in surveillance data collection, variations in national testing policies and the level of testing policy implementation [9].

Sexually active young people between 15–24 years, especially women, continued to have the highest rates of reported chlamydia infections in 2021. This is consistent with data on sexual behaviour among young people and testing policies frequently prioritising these groups [10,11]. Availability of self-sampling in a patient selected location (i.e. home-based sampling, community outreach) combined with online services appears to optimise access to testing and testing coverage among populations at risk (e.g. young people, MSM) [12].

Despite a low level of completeness of the information on transmission category and HIV status of reported cases of chlamydia infection, the EU/EEA surveillance data indicate an increase in chlamydia diagnoses among MSM over the last five years, particularly among HIV-negative MSM. In a nationwide, cross-sectional prevalence study among MSM in Germany, conducted in 2018, chlamydia prevalence was highest among HIV-negative MSM using HIV pre-exposure prophylaxis (PrEP) (13.8%), followed by HIV positive MSM (10.1%) and HIV negative MSM not using PrEP (7.2%) [13]. Rising STI diagnoses, including of chlamydia, among HIV negative MSM using PrEP in London, were explained by changes in sexual behaviour (i.e. increases in condomless anal intercourse, number of sexual partners), increased screening and increased clinical attendance [14]. Regular asymptomatic screening for STIs among PrEP users is recommended by most clinical guidelines on PrEP in addition to prompt treatment and partner notification upon STI diagnosis [15].

The large differences in testing, control policies and surveillance methods for chlamydia infection across the EU/EEA also mean that these results should be interpreted with caution, particularly when comparing data at the European level.

## Public health implications

The high rate of reported chlamydia diagnoses among young adults indicates that further control efforts are required. To assist Member States in developing their chlamydia programmes, ECDC has published a guidance document on chlamydia control [6]. The updated guidance recommends that EU/EEA Member States have a national strategy or plan for the control of STIs (including chlamydia). The strategy should include the provision of primary prevention interventions to at-risk individuals and groups, evidence-based case management guidelines that include partner notification for each setting in which chlamydia may be diagnosed, improved systems for the surveillance of diagnosed infections and an evaluation plan for the strategy. The guidance also highlights that there are still gaps in the evidence base regarding population-level chlamydia control. At present, widespread opportunistic testing or screening programmes are only recommended if resources are available and suitable monitoring and evaluation is in place.

Further development of chlamydia surveillance at the European level needs to consider current limitations. Member States may benefit from studies estimating the prevalence of chlamydia infection in their country, which would help to explore where testing programmes may best be introduced or expanded. Such estimates need to be systematically synthesised at the EU/EEA level to gain a complete picture of overall disease burden.

Monitoring numbers of STI diagnoses and emerging trends of risk compensation among PrEP users will offer data to assess the impact of PrEP for HIV on the sexual health of MSM and to inform preventive strategies [15,16].

A better understanding of prevention and testing policies and other indicators can provide context to the surveillance data on chlamydia and can also support the measurement of EU/EEA country progress towards the WHO European Regional Action Plan on STI [17].

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