

SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Chlamydia infection

Key facts

- In 2016, 26 EU/EEA Member States reported 403 807 cases of chlamydia infection.
- The overall notification rate was 185 cases per 100 000 population.
- Notification rates of chlamydia infection varied considerably across Europe, with the highest country-specific rates more than 5 000 times higher than the lowest rates. This is believed to be mainly a reflection of the differences in chlamydia testing, case finding and reporting, rather than being indicative of actual differences in chlamydia prevalence.
- Notification rates continue to be highest among young adult women and heterosexuals.
- The overall trend appears stable over recent years, but there are variations at the country level.

Methods

This report is based on data for 2016 retrieved from The European Surveillance System (TESSy) on 27 November 2017. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases in the EU/EEA.

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 at the ECDC website [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 chlamydia 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 reported data based on the standard EU case definitions [4]. Five countries reported data based on national case definitions, and four countries did not report which case definition they were using [2]. Surveillance systems for chlamydia in Europe vary: 20 countries have comprehensive surveillance systems, and six have sentinel systems that only capture chlamydia diagnoses from a selection of healthcare providers. Reporting of chlamydia infection is compulsory in the countries that maintain a comprehensive

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surveillance system, with the exception of the United Kingdom. Reporting is voluntary in countries that maintain a sentinel system with the exception of Hungary, where reporting is compulsory.

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: Austria (2007, 2008), Belgium (2015, 2016), Hungary (2007, 2008), and Poland (2006 to 2016). Lithuania did not report information on age between 2003 and 2007.

Epidemiology

Geographic distribution

In 2016, 26 countries reported 403 807 chlamydia infections (Table 1). The notification rate for the 20 EU/EEA countries with comprehensive surveillance systems was 185 per 100 000 population. The United Kingdom accounted for 57% of all reported cases in 2016; the combined case numbers of Denmark, Norway and Sweden, and the United Kingdom amount to 81% of all cases reported in 2016. The disproportionate contribution of the United Kingdom is due to their inclusion of data from a successful screening programme targeted at 15–24-year-olds in England, which has been in operation since 2008. This programme offers community-based testing services outside of sexually transmitted infection (STI) clinics and resulted in a large increase of chlamydia diagnoses from 2008 onwards.

Table 1. Distribution of confirmed chlamydia cases by country and year, EU/EEA, 2012–2016

Country	2012		2013		2014		2015		2016	
	Confirmed cases	Rate	Confirmed cases	Rate	Confirmed cases	Rate	Confirmed cases	Rate	Confirmed cases	Rate
Austria	.	.	.	.	.	.	.	.	.	.
Belgium	4675	-	4983	-	5496	-	6159	-	7353	-
Bulgaria	131	1.8	323	4.4	495	6.8	255	3.5	195	2.7
Croatia	305	7.1	356	8.4	386	9.1	332	7.9	217	5.2
Cyprus	10	1.2	2	0.2	0	0.0	0	0.0	0	0.0
Czech Republic	.	.	.	.	.	.	.	.	.	.
Denmark	26385	472.8	27683	494.1	30934	549.7	31782	561.5	33892	593.8
Estonia	1624	122.5	1580	119.7	1558	118.4	1338	101.8	1216	92.4
Finland	13247	245.3	13216	243.5	13246	243.0	13572	248.0	14321	261.0
France	13074	-	12932	-	14227	-	14971	-	13624	-
Germany	.	.	.	.	.	.	.	.	.	.
Greece	396	3.6	486	4.4	388	3.6	197	1.8	.	.
Hungary	1060	-	1130	-	1121	-	965	-	882	-
Iceland	1918	600.2	2179	677.0	1723	529.1	1989	604.4	2200	661.6
Ireland	6182	134.9	6293	137.1	6640	144.2	6722	145.2	6861	145.2
Italy	946	-	953	-	940	-	776	-	407	-
Latvia	1747	85.4	2047	101.1	2170	108.4	1420	71.5	1329	67.5
Liechtenstein	.	.	.	.	.	.	.	.	.	.
Lithuania	265	8.8	306	10.3	449	15.3	409	14.0	348	12.0
Luxembourg	4	0.8	2	0.4	0	0.0	9	1.6	6	1.0
Malta	157	37.6	134	31.8	98	23.0	155	36.1	270	62.2
Netherlands	14730	-	15794	-	17975	-	18635	-	20768	-
Norway	21489	431.0	22249	440.5	24810	485.7	25207	487.9	26108	501.0
Poland	314	0.8	406	1.1	271	0.7	364	1.0	329	0.9
Portugal	0	0.0	0	0.0	15	0.1	149	1.4	174	1.7
Romania	59	0.3	18	0.1	15	0.1	14	0.1	24	0.1
Slovakia	754	14.0	919	17.0	1031	19.0	1311	24.2	857	15.8
Slovenia	249	12.1	248	12.0	270	13.1	248	12.0	217	10.5
Spain	1033	-	1513	-	2225	-	3564	-	7306	-
Sweden	37773	398.3	34908	365.3	36818	381.7	37922	389.0	35405	359.4
United Kingdom	241163	379.8	241872	378.5	240823	374.2	228972	352.9	229498	351.0
EU-EEA	389690	186.1	392532	186.3	404124	179.7	397437	174.5	403807	184.5

Note: Twenty-one cases with unknown classification were reported by Croatia (12) and Portugal (9) and are not included in the analysis.

–: Rates are presented only for countries with comprehensive surveillance systems.

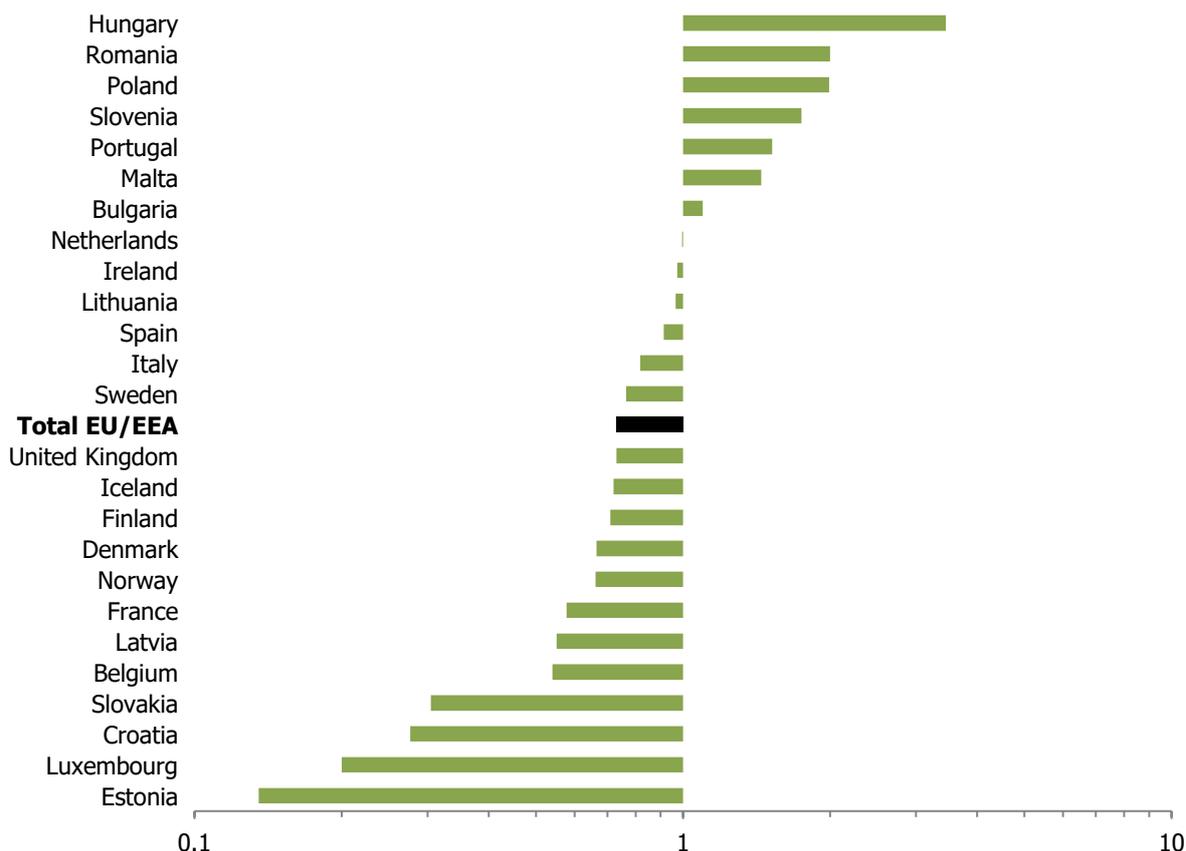
In 2016, notification rates greater than 200 cases per 100 000 were observed in Iceland (662 per 100 000), Denmark (594), Norway (501), Sweden (359), the United Kingdom (351) and Finland (261) (Table 1). All countries reporting rates above 200 per 100 000 had chlamydia control strategies recommending either active screening

(UK–England) or widespread opportunistic testing (Denmark, Finland, Iceland, Norway, Sweden and the rest of the United Kingdom). Rates below 10 per 100 000 were reported by seven countries (Bulgaria, Croatia, Cyprus, Luxembourg, Poland, Portugal and Romania).

Gender

The overall male-to-female ratio in 2016 was 0.7 (Figure 1), with 169 312 cases reported in men compared with 231 766 cases among women. Among countries with comprehensive surveillance systems, the overall notification rate was 180 per 100 000 in men and 240 per 100 000 in women. The male-to-female ratios were below or close to 1 in the majority of countries. Male-to-female ratios above 1.5 were reported from three countries with comprehensive systems: Slovenia (1.7), Poland (2.0) and Romania (2.0). These countries report relatively small numbers of cases. The lowest male-to-female ratio was observed in Estonia (0.1) and the highest in Hungary (3.5).

Figure 1. Chlamydia male-to-female ratio in 25 EU/EEA countries, 2016

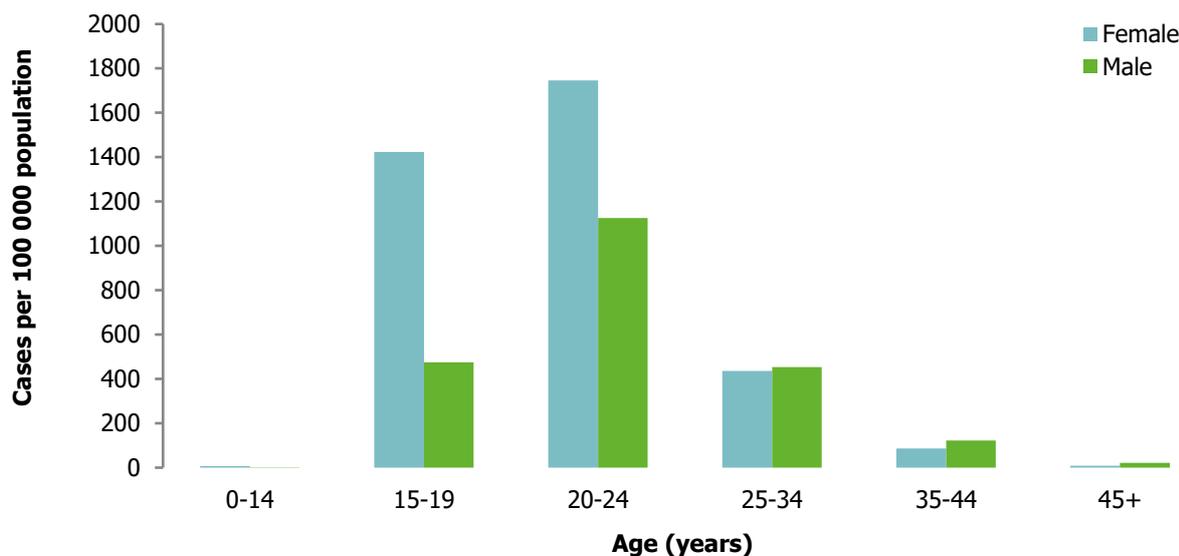


Age

In 2016, information on age was available for 380 946 (94.3%) cases.

The largest proportion of cases reported in 2016 were among 20–24-year-olds, who accounted for 40.1% of cases. The second largest group was the age group 25–34 years, accounting for 27.1% of cases; young adults aged 15–24 years accounted for 62.5% of cases with known age. This pattern was also reflected in the age-specific notification rates (Figure 2). The highest rates for 2016 were seen in the 20–24 year age group, with 1 428 cases per 100 000 reported by countries with comprehensive systems. Rates among 15–19-year-olds were also very high at 938 cases per 100 000 population. The highest rates were reported among women aged 20 to 24 years (1 745 cases per 100 000 population) and 15 to 19 years (1 423 per 100 000). Rates among men were highest among 20–24-year-olds (1 125 per 100 000). Rates among men over 25-year-old were consistently higher than among women of the same age.

Figure 2. Distribution of confirmed chlamydia cases per 100 000 population, by age and gender, EU/EEA, 2016

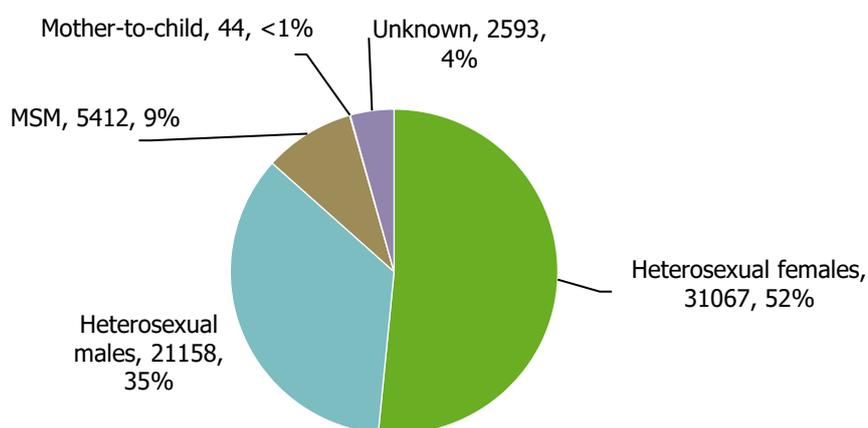


Source: Country reports from Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Transmission

In 2016, information on transmission category was available for 45% of reported cases of chlamydia infection (n=182 152). The main reason for the relatively low completeness for this variable is that countries reporting high numbers of cases (Denmark, Norway, Finland and France) have laboratory-based surveillance systems which are not linked to clinical surveillance and therefore do not include data on transmission. When excluding countries that reported transmission information in less than 60% of their case data, information on transmission was available for 60 274 cases (15% of all reported cases) from ten countries. Of these cases, 87% were indicated as heterosexual transmission, 9% were in men who have sex with men (MSM), and 4% of all transmissions were categorised as 'unknown' (Figure 3).

Figure 3. Distribution of chlamydia infections by transmission category and gender (n=60 274), EU/EEA, 2016



Note: EU/EEA countries with $\geq 60\%$ completeness in the transmission category
Data from Hungary, Latvia, Lithuania, Malta, the Netherlands, Portugal, Romania, Slovakia, Slovenia and Sweden.

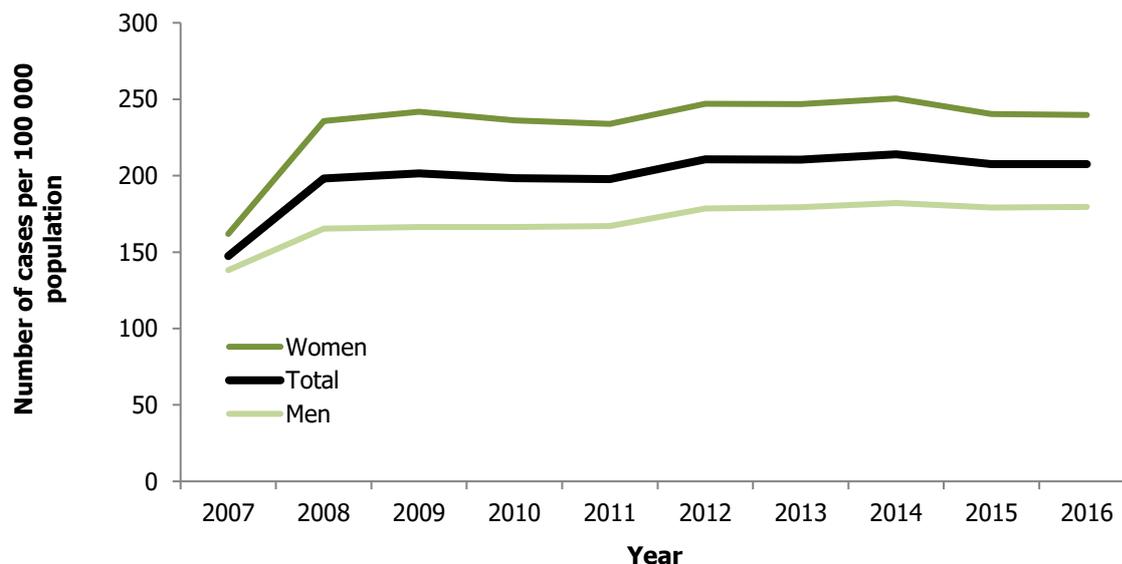
Trends 2007–2016

Between 2007 and 2016, 3 674 950 cases of chlamydia infection were reported from 27 countries. The completeness of reported data showed some improvement over time because several countries upgraded their surveillance systems during this period. The overall notification rate among countries with comprehensive surveillance systems increased from 147 cases per 100 000 in 2007 to 189 in 2009. Since then, the overall rate has

remained relatively stable. Changes in notification rates are affected by the increasing number of countries that reported data over the years. The overall rate among countries which reported consistently between 2007 and 2016 (Cyprus, Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Sweden and the United Kingdom) increased by 41% (from 147 to 208 cases per 100 000 population). Throughout this time period, rates among women have remained consistently higher than among men (Figure 4).

The EU/EEA notification rate remained stable between 2012 and 2016 (decrease by 1% overall). Country-specific trends showed variations both in countries reporting large numbers of cases such as the United Kingdom (-8%), Sweden (-10%), Norway (+16%) and Denmark (+26%), and in countries reporting smaller numbers of cases such as Romania (-59%) and Malta (+65%).

Figure 4. Distribution of confirmed chlamydia cases per 100 000 population by gender and year, EU/EEA countries reporting consistently, 2007–2016



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

Note: In 2008, the United Kingdom started including data from a screening programme targeted at 15–24-year-olds in England. This programme offers community-based testing services outside of STI clinics and resulted in a large increase of chlamydia diagnoses from 2008 onwards.

Discussion

In 2016, the overall rate of chlamydia diagnoses reported in the EU/EEA remained high, driven mostly by reports from countries with more intensive control activities and more complete reporting to surveillance systems [5]. The large difference in country-specific rates persisted in 2016: notification rates in Iceland, Denmark and Norway were more than 5 000 times higher than in Cyprus and Romania. The geographical gradient also remained, with rates above 200 cases per 100 000 population reported by countries in the western and northern parts of the EU/EEA, and rates below 30 cases per 100 000 population in many eastern and southern countries.

In contrast to this heterogeneity, the estimates of chlamydia prevalence from population-based surveys suggest a more homogenous distribution of chlamydia across the EU/EEA countries [6]. Moreover, prevalence estimates from EU/EEA Member States were consistent with estimates from other, non-European high-income countries. A recent study found chlamydia prevalence among young adults in Poland similar to estimates from countries in the west of Europe [7]. This suggests that differences in notification rates across Europe are more likely to reflect the extent of access to sensitive diagnostics, differences in surveillance data collection, variations in national testing policies, and the level of testing policy implementation rather than actual differences in prevalence [5].

In 2016, as in the years before, sexually active young people between 15 and 24 years of age had the highest risk of being diagnosed and reported with chlamydia infection. This is consistent with data on risk-taking sexual behaviour and testing policies frequently targeted to this group [8]. The distribution of chlamydia notifications by gender and the excess of diagnoses reported among females (in all but seven countries in 2016) reflects the fact that women are prioritised by testing policies across the EU/EEA. This is in line with evidence that a single offer of chlamydia testing in the context of a screening programme may reduce the incidence of pelvic inflammatory disease by one third (36%) after one year of follow-up [9].

The large differences in control policies and surveillance methods for chlamydia infection across the EU/EEA also imply that these results should be interpreted with caution, particularly when making comparisons 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 published an updated guidance document on chlamydia control [10]. The updated guidance recommends that EU/EEA Member States should 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. At present, widespread opportunistic testing or screening programmes are only recommended if resources are available and suitable monitoring and evaluation is in place. The guidance also highlights that there are still gaps in the evidence base regarding population-level chlamydia control.

Further development of chlamydia surveillance at the European level needs to take into account 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. Providing more information on the coverage of existing surveillance systems, as well as testing denominator data could improve the understanding of the burden of infection across Europe. Such efforts should also take into account the effects of the different testing policies in Europe.

References

1. European Centre for Disease Prevention and Control. Introduction to the Annual epidemiological report for 2016. In: ECDC. Annual epidemiological report for 2016. Stockholm: ECDC; 2017. Available from: <https://ecdc.europa.eu/en/annual-epidemiological-reports-2016/methods>.
2. European Centre for Disease Prevention and Control. Surveillance systems overview [internet, downloadable spreadsheet]. Stockholm: ECDC; 2018. Available from: <https://ecdc.europa.eu/en/publications-data/surveillance-systems-overview-2016>.
3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases [internet]. Stockholm: ECDC; 2017 [cited 30 Jan 2018]. Available from: <http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=12>
4. European Centre for Disease Prevention and Control. EU case definitions [internet]. Stockholm: ECDC; 2017 [cited 9 February 2018]. Available from: <https://ecdc.europa.eu/en/infectious-diseases-public-health/surveillance-and-disease-data/eu-case-definitions>
5. European Centre for Disease Prevention and Control. Chlamydia control in Europe - a survey of Member States. 2014. Available from: <http://ecdc.europa.eu/en/publications/Publications/chlamydia-control-survey-europe-2012.pdf>.
6. Redmond SM, Alexander-Kisslig K, Woodhall SC, van den Broek IV, van Bergen J, Ward H, et al. Genital chlamydia prevalence in Europe and non-European high income countries: systematic review and meta-analysis. PloS one. 2015;10(1):e0115753.
7. Czerwinski M, Niedzwiedzka-Stadnik M, Zielicka-Hardy A, Tomusiak A, Sadkowska-Todys M, Zielinski A, et al. Genital Chlamydia trachomatis infections in young adults - a school-based bio-behavioural study in urban areas, Poland, 2012 to 2015. Euro surveillance : bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin. 2018 Feb;23(6).
8. Velicko I, Ploner A, Sparen P, Marions L, Herrmann B, Kuhlmann-Berenzon S. Sexual and testing behaviour associated with Chlamydia trachomatis infection: a cohort study in an STI clinic in Sweden. BMJ open. 2016 Aug 26;6(8):e011312.
9. European Centre for Disease Prevention and Control. Chlamydia control in Europe: literature review. 2014. Available from: <http://ecdc.europa.eu/en/publications/Publications/chlamydia-control-europe.pdf>.
10. European Centre for Disease Prevention and Control. Guidance on chlamydia control in Europe – 2015 Stockholm: ECDC; 2016. Available from: <https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/chlamydia-control-europe-guidance.pdf>.