SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Gonorrhoea

Key facts

- 75 349 cases of gonorrhoea were reported by 27 EU/EEA Member States for 2016.
- The overall notification rate was 18.8 cases per 100 000 population.
- Rates of reported gonorrhoea infection vary considerably across Europe, with higher rates reported in northern Europe.
- Men who have sex with men (MSM) accounted for almost half of the reported cases (46%) in 2016.
- The number of reported cases remained stable compared with 2015, reflecting fewer diagnosed cases in the United Kingdom but increases in other countries.

Methods

This surveillance report is based on gonorrhoea 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. Data for 2016 were retrieved from The European Surveillance System (TESSy) on 22 January 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, please 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].

In 2016, the majority of countries (17) reported data using the standard EU case definitions [4]. Five countries reported case numbers based on national case definitions, and five countries did not state which case definition they were using.

Surveillance systems for gonorrhoea in Europe vary: 23 countries have comprehensive surveillance systems, and four have sentinel systems that only capture gonorrhoea diagnoses from a selection of healthcare services [2]. Reporting of gonorrhoea infection is compulsory in 23 countries. Of the four countries with sentinel surveillance systems, Belgium, France and the Netherlands have voluntary reporting systems whereas Hungary has compulsory

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notification. All countries with comprehensive surveillance systems have compulsory notification except for the United Kingdom.

In the analysis below, data from sentinel systems were not used in the calculation of national or overall rates because the coverage was not always known and denominators were therefore not available. Cases were analysed by date of diagnosis. Due to incompatibilities in data presentation and age formats, data from Belgium (2015–2016), Hungary (2007–2008) and Poland (2006–2016) were excluded from all analyses that involved age groups.

Epidemiology

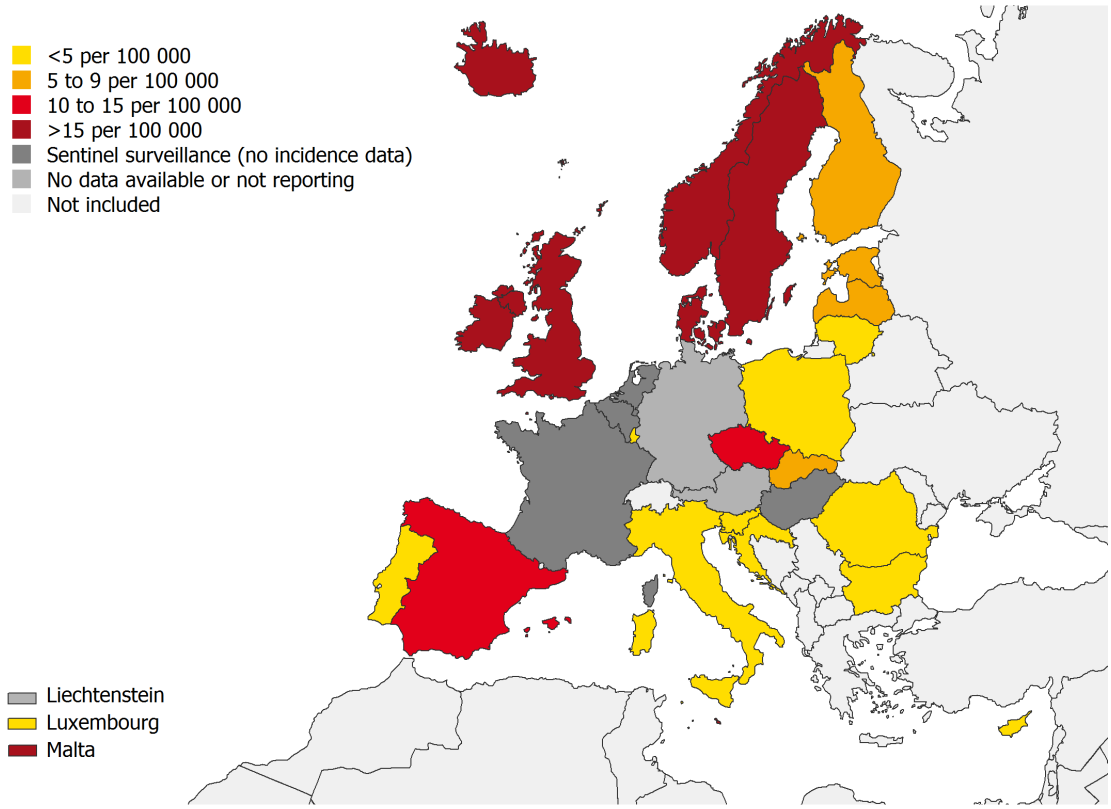
In 2016, 75 349 confirmed gonorrhoea cases were reported in 27 countries, a decrease of 0.7% compared to 2016. One country less (Greece) reported data for 2016 compared to 2015. The United Kingdom reported 53% of all cases reported in 2016 (Table 1). The notification rate in 2016 was 18.8 per 100 000 population for countries with comprehensive surveillance systems, a slight decrease from 2015. The highest rates in 2016 (>20/100 000 population) were observed in the United Kingdom (61 per 100 000), Ireland (41), Denmark (35), Iceland (29) and Norway (21). The lowest rates (<1 per 100 000) were observed in Croatia, Cyprus and Romania. Figure 1 displays the distribution of gonorrhoea rates among countries reporting from comprehensive surveillance systems.

Table 1. Distribution of confirmed cases of gonorrhoea, EU/EEA, 2012-2016

Country	2012		2013		2014		2015		2016				
	Confirmed cases		Confirmed cases		Confirmed cases		Confirmed cases		National coverage	Reported cases	Confirmed cases		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate			Number	Rate	ASR
Austria	283	-	1148	-	.	.	.	.	.	.	.	.	.
Belgium	931	-	1011	-	1119	-	1368	-	N	1997	1997	-	-
Bulgaria	99	1.4	96	1.3	170	2.3	119	1.7	Y	115	115	1.6	-
Croatia	14	0.3	14	0.3	22	0.5	18	0.4	Y	13	12	0.3	0.3
Cyprus	6	0.7	2	0.2	4	0.5	1	0.1	Y	1	1	0.1	0.1
Czech Republic	1142	10.9	1407	13.4	1394	13.3	1459	13.8	Y	1437	1437	13.6	14.2
Denmark	673	12.1	816	14.6	1140	20.3	2787	49.2	Y	2007	2007	35.2	37.9
Estonia	215	16.2	133	10.1	139	10.6	118	9.0	Y	94	94	7.1	7.7
Finland	312	5.8	267	4.9	286	5.2	281	5.1	Y	416	416	7.6	8.4
France	3935	-	4884	-	5211	-	6228	-	N	7757	7757	-	-
Germany	.	.	.	.	.	.	.	.	.	.	.	.	.
Greece	238	2.1	219	2.0	245	2.2	237	2.2	.	.	.	.	.
Hungary	1487	-	1526	-	1620	-	1246	-	N	1176	1176	-	-
Iceland	29	9.1	19	5.9	38	11.7	45	13.7	Y	95	95	28.6	29.3
Ireland	1139	24.9	1274	27.7	1314	28.5	1281	27.7	Y	1951	1951	41.3	43.5
Italy	421	0.7	537	0.9	635	1.0	649	1.1	Y	760	760	1.3	-
Latvia	607	29.7	554	27.4	367	18.3	288	14.5	Y	166	166	8.4	8.9
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	219	7.3	190	6.4	165	5.6	194	6.6	Y	119	119	4.1	4.3
Luxembourg	5	1.0	4	0.7	6	1.1	14	2.5	Y	9	9	1.6	1.7
Malta	29	6.9	62	14.7	51	12.0	66	15.4	Y	74	74	17.0	17.6
Netherlands	3996	-	4171	-	4632	-	5420	-	N	6129	6129	-	-
Norway	443	8.9	506	10.0	682	13.4	851	16.5	Y	1096	1096	21.0	22.1
Poland	733	1.9	549	1.4	495	1.3	500	1.3	Y	437	437	1.2	-
Portugal	104	1.0	105	1.0	188	1.8	277	2.7	Y	456	273	2.6	2.9
Romania	323	1.6	340	1.7	178	0.9	90	0.5	Y	114	114	0.6	0.6
Slovakia	286	5.3	378	7.0	426	7.9	341	6.3	Y	277	277	5.1	4.9
Slovenia	45	2.2	62	3.0	61	3.0	73	3.5	Y	81	81	3.9	4.2
Spain	3044	6.5	3315	7.1	4562	9.8	5006	10.8	Y	6816	6816	14.7	-
Sweden	1092	11.5	1110	11.6	1346	14.0	1670	17.1	Y	1774	1774	18.0	19.9
United Kingdom	30090	47.4	34230	53.6	40519	63.0	45224	69.7	Y	40166	40166	61.4	63.0
EU/EEA	**51940**	**13.0**	**58929**	**14.5**	**67015**	**17.0**	**75851**	**19.3**	**.**	**75533**	**75349**	**18.8**	**24.1**

ASR: Age-standardised rate
- = rate not calculated because country has a sentinel surveillance system

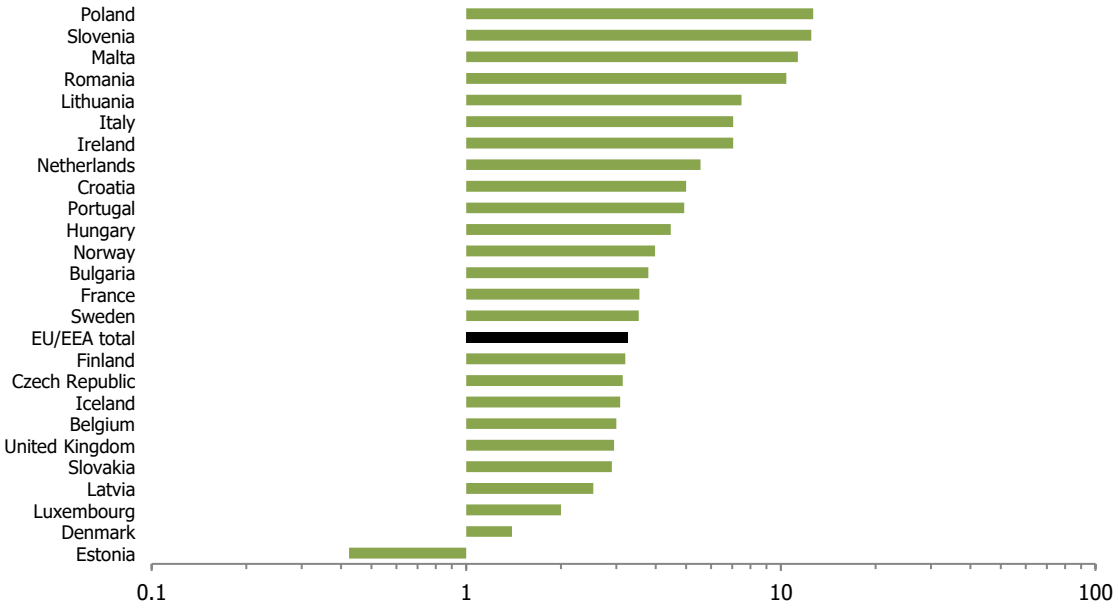
Figure 1. Distribution of confirmed gonorrhoea cases per 100 000 population, by country, EU/EEA, 2016



Gender

The male-to-female ratio in 2016 was 3.3:1 (Figure 2). The notification rate was 30 per 100 000 population among men (52 368 cases) and 9.5 per 100 000 population among women (16 084 cases). Male-to-female ratios below two were reported by Denmark (1.4) and Estonia (0.4). The highest male-to-female ratios were reported by Poland (13), Slovenia (13) and Malta (11). Cyprus did not report any cases among women.

Figure 2. Gonorrhoea, male-to-female ratio in 25 EU/EEA countries, 2016



Age

In 2016, information on age was available for 23 countries, but in different formats. Information on age was not available for Belgium, Bulgaria, Poland and Spain (12% of all cases). The largest proportion of cases reported in 2016 was among 25–34-year-olds (37% of cases) and 15–24-year-olds (36% of cases). In countries with comprehensive surveillance systems, age-specific rates of reported cases in 2016 were highest among 20–24-year-olds overall (98 per 100 000 population) (Figure 3). Among 15–19-year-olds, rates were higher in females (55 per 100 000) than in males (39 per 100 000). Among older age groups, rates were higher among males. The highest age- and gender-specific rates were among males aged 20–24 years (128 per 100 000).

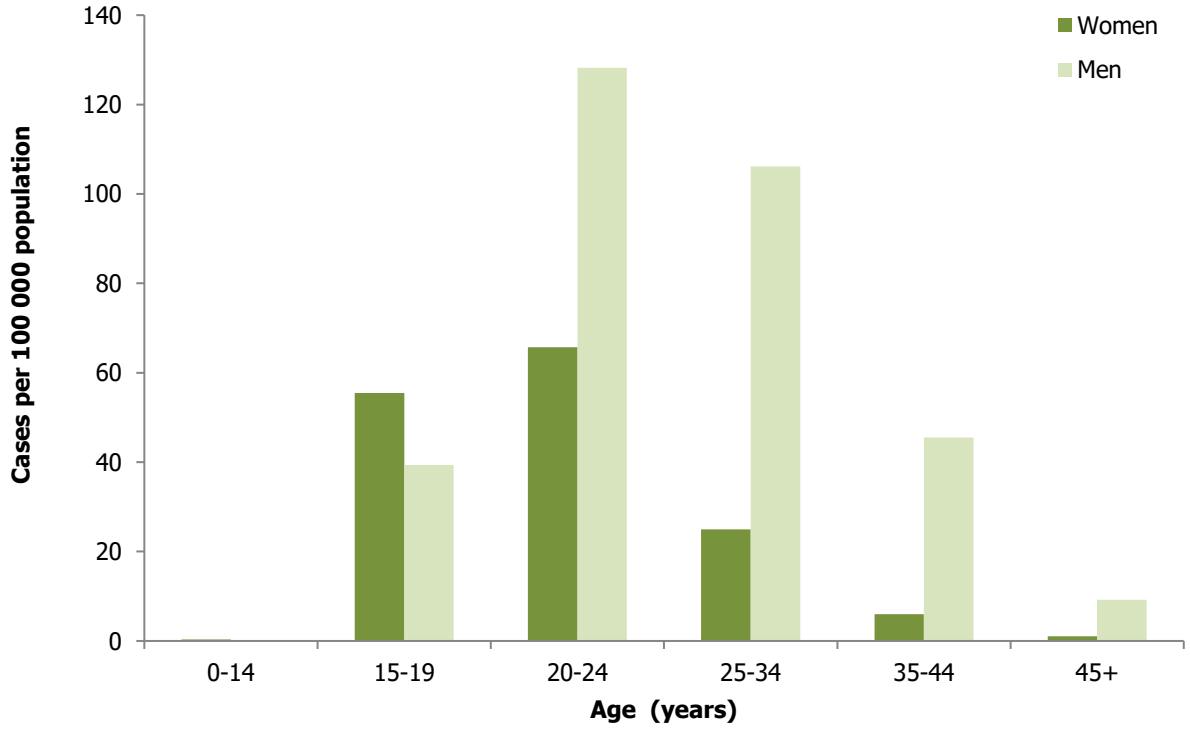
Transmission

In 2016, 15 countries (accounting for 76% of the reported gonorrhoea cases) reported data on the mode of transmission for 60% or more of their cases (the Czech Republic, Denmark, Finland, Hungary, Ireland, Latvia, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom). In this group of 15 countries, 46% of all cases were in men who have sex with men (MSM), 46% were reported among heterosexuals, and for 8% of cases the transmission group was reported as 'unknown' (Figure 4). In 2016, cases diagnosed in MSM represented 66% (n=26 451) of male cases diagnosed in the above group of 15 countries with known mode of transmission. The percentage of cases diagnosed in MSM ranged from below 10% (Latvia, Romania and Slovakia) to 50% or over (Malta, the Netherlands, Norway and Sweden).

HIV status

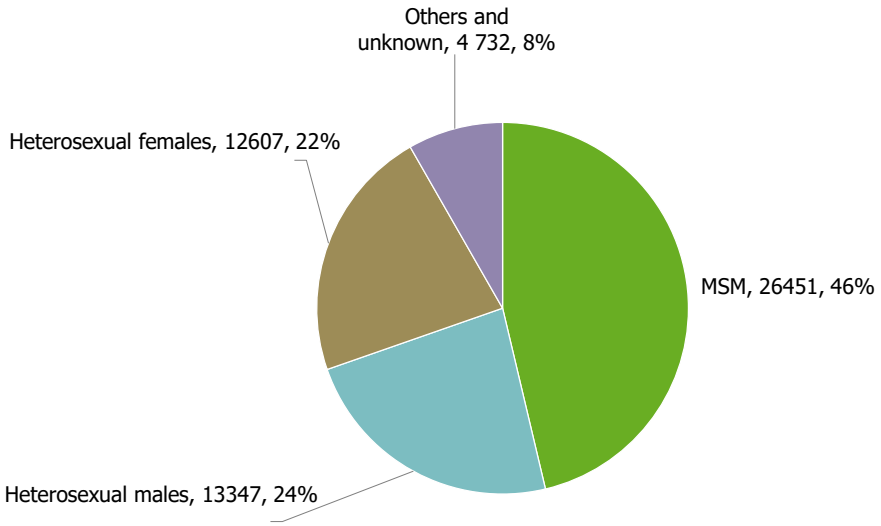
Data on the HIV status of cases for 2016 were provided by 12 countries (the Czech Republic, Denmark, France, Hungary, Latvia, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia and the United Kingdom), accounting for 81% of all reported gonorrhoea cases. Of these 60 672 cases, 9% were HIV-positive (either known or newly diagnosed), 58% were HIV-negative; no information on coinfection was available for the remaining 32%. Among MSM (26 319 cases), 20% were HIV-positive, 66% were HIV-negative; no further information was available for 14%.

Figure 3. Distribution of confirmed gonorrhoea cases per 100 000 population, by age and gender, EU/EEA, 2016



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

Figure 4. Percentage of gonorrhoea infections by transmission category and gender (n=57 137), EU/EEA, 2016



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

Trends 2007–2016

Between 2007 and 2016, 499 733 cases of confirmed gonorrhoea were reported in 29 countries, with varying degrees of data completeness over this period. The number of countries reporting has been stable since 2006, with the exception of Austria, that did not report data since 2014 due to a revision of the surveillance system, and Greece that was unable to report data for 2016. Croatia has reported data since 2012 when the country joined the European Union.

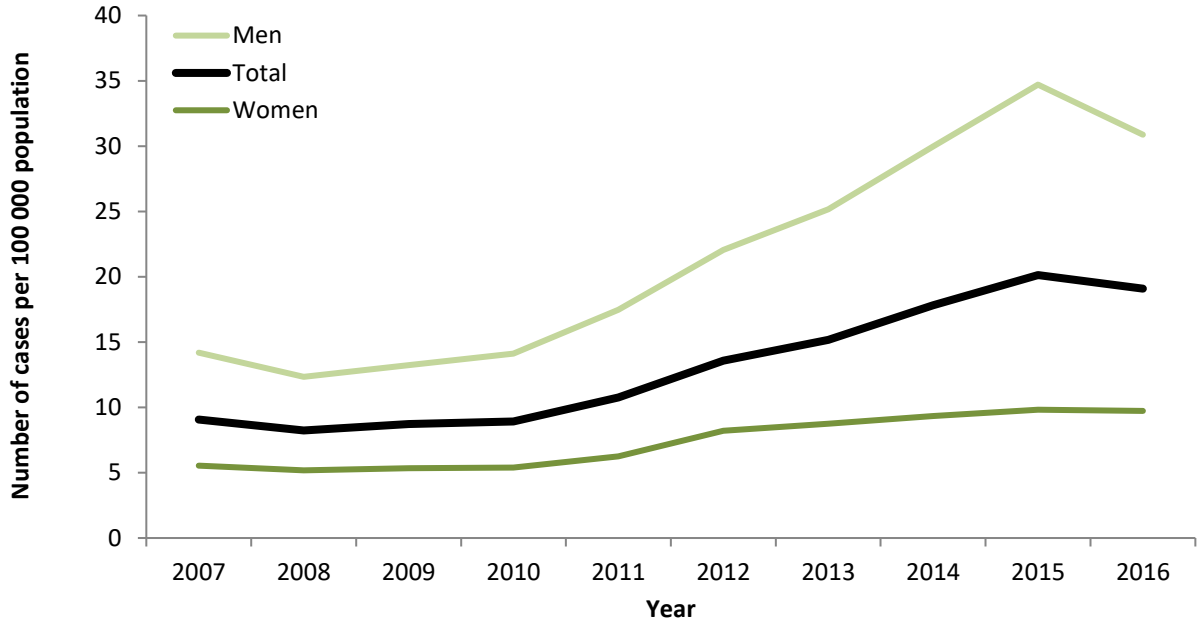
The incidence rate in the 22 countries that reported consistently between 2007 and 2016 initially decreased from 9.1 per 100 000 population in 2007 to 8.2 per 100 000 population in 2008. After 2008, a marked increase in the crude rate was recorded, reaching a peak at 20 cases per 100 000 population in 2015. In 2016, the rate decreased again slightly (Figure 5). Throughout this period, rates in men were consistently higher than in women. Rates increased for both genders since 2008, but the increase was more pronounced among men (+150%) than among women (+88%). Between 2015 and 2016, rates decreased for both genders for the first time since 2008 (men: −11%, women: −0.9%).

Age-specific rates increased among all age groups since 2007, with the largest increases among 25–34-year-olds (2.5-fold), persons aged 45 years and over (2-fold), and 35–44-year-olds (1.9-fold). The rate of reported gonorrhoea increased between 2008 and 2016 in 15 of 22 reporting countries with comprehensive systems.

The number of reported cases increased in 19 of 26 reporting countries. The largest increases since 2007 in countries reporting more than 15 cases each year, were reported from France (6-fold), Denmark (4.7-fold) and Ireland (3.7-fold). The increase in reported cases in Denmark between 2013 and 2016 is partly due to improved surveillance system coverage.

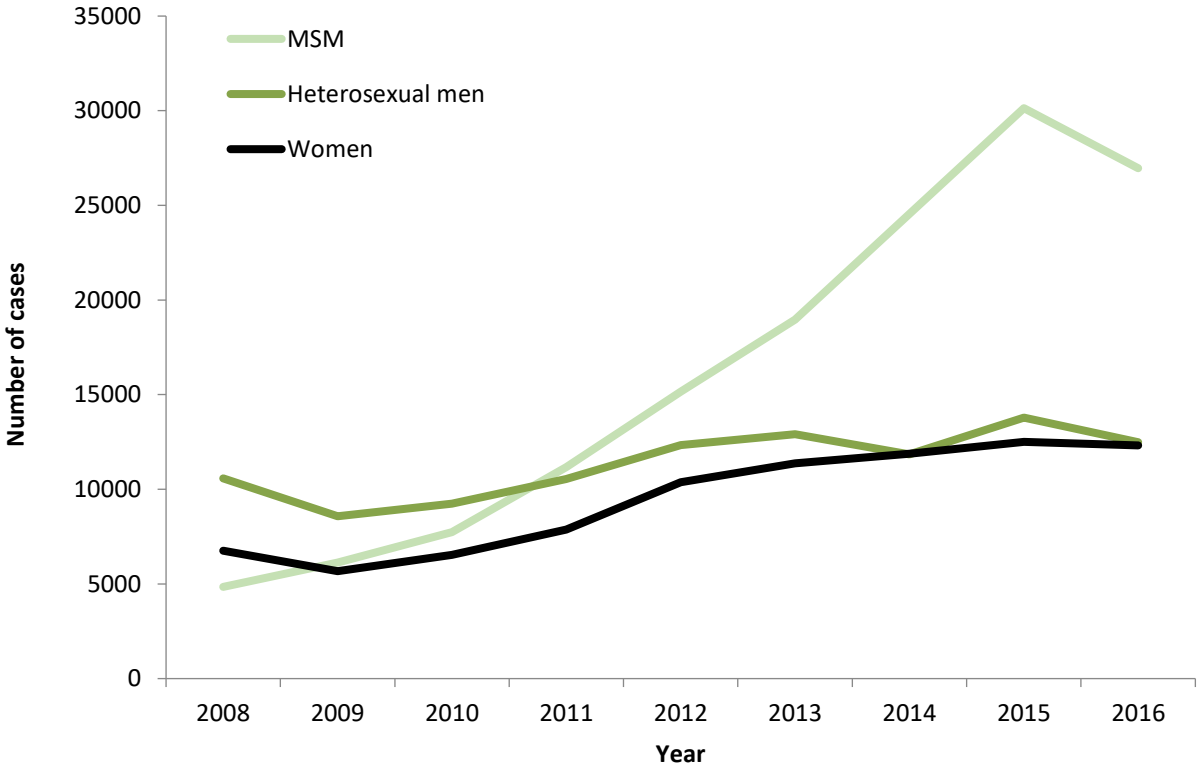
Between 2008 and 2016, when data on the mode of transmission were more completely reported, case numbers among countries reporting consistently showed an increasing trend among all risk groups, most markedly among MSM (Figure 6). The number of cases reported in all risk groups, however, showed a decrease when compared with 2015. Cases decreased most markedly in MSM (−11%) and heterosexual men (−9%). Cases in women decreased by 1.5% between 2015 and 2016; 2016 also marked the first time the number of reported cases decreased in MSM since 2008; it was also the first decrease in reported female cases since 2009. At country level, only the United Kingdom reported fewer cases in MSM in 2016 than in 2015 (−21%), while all other countries reported a 23% median increase (range 5.3%–58%) of cases in MSM. Decreases in cases in heterosexual men were more pronounced in the United Kingdom (−12%, median for other countries: −5.3%).

Figure 5. Rate of confirmed gonorrhoea cases per 100 000 population by gender and year, EU/EEA countries reporting consistently, 2007–2016



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

Figure 6. Number of confirmed gonorrhoea cases by gender, transmission category and year, EU/EEA countries reporting consistently, EU/EEA, 2008–2016



Source: Country reports from the Cyprus, the Czech Republic, Denmark, France, Latvia, Lithuania, Malta, the Netherlands, Norway, Romania, Slovenia, Sweden and the United Kingdom.

Discussion

The increase in the overall gonorrhoea notification rate observed since 2008 appears to have levelled off in 2016. This is mainly the result of a decrease in cases reported in the United Kingdom, which reported 53% of all cases notified in the EU/EEA. This decrease was not mirrored by the trends in most other countries, which reported increases.

In the United Kingdom, a decrease in cases was observed in all risk groups, but was most pronounced in MSM and heterosexual men. The decrease of gonorrhoea cases in MSM in the United Kingdom coincided with a 23% decrease in HIV diagnoses in MSM in London between 2015 and 2016 that was linked to improvements in HIV testing, time to anti-retroviral treatment, and HIV pre-exposure prophylaxis [5,6,7]. Syphilis rates, however, continue to increase in the United Kingdom.

Despite this, the rate of reported gonorrhoea infections remains at a high level, both in the United Kingdom and across the EU/EEA, indicating continuing high levels of risk behaviour. This is concerning in view of the high levels of resistance to azithromycin reported by the latest data from the European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP) that show that the current recommended dual treatment regimen for gonorrhoea (ceftriaxone and azithromycin) is threatened [8]. Euro-GASP data also show that resistance to cefixime and ciprofloxacin remained stable in 2016 compared with 2015 [9]. In addition, no isolates with resistance to ceftriaxone were detected; in 2015, there was one ceftriaxone-resistant isolate, five in 2014, and seven in 2013.

The increasing trend in the number of reported gonorrhoea cases in many countries continues to be mostly driven by increasing cases in MSM. When excluding the United Kingdom, MSM were the only group which saw an increase in reported cases in 2016 compared with 2015; cases among women and heterosexual men appear to have decreased slightly. The increase in reported cases in MSM could be related to increased risk behaviour [10], increased testing among MSM (particularly at extra-genital sites, a practice recommended by recent guidance) [11], and the more widespread use of nucleic acid amplification tests (NAATs) [12,13].

The distribution of reported gonorrhoea cases continues to vary considerably across the EU/EEA, with rates ranging from below 1 to 61 cases per 100 000 population. The United Kingdom reported over half of the total number of EU/EEA cases in 2016, even though the UK's share decreased because the number of cases reported in the United Kingdom sank while other countries reported increases. High rates (above 15 per 100 000 population) were reported mostly in northern European countries, including Denmark, Iceland, Ireland, Norway, Sweden and the United Kingdom, but also in Malta. This geographical pattern has been stable in recent years. The variation in rates could be linked to real differences in incidence of infection. However, there are important differences across Europe in terms of testing policies and methods, healthcare systems and access to services, the role of private healthcare providers, inclusion of data in reporting systems, and surveillance system structures.

In some countries where the transmission category of cases is either not reported, or reported with very low completeness, the high male-to-female ratio suggests that MSM also account for a large proportion of cases (e.g. Bulgaria, Croatia, Lithuania and Poland). In other countries, the high male-to-female ratio suggests that cases could be misclassified as heterosexual, when in reality they are related to sexual transmission between men. This is likely due to a lack of identification of homosexually acquired cases or a lack of self-reporting of such transmission. EMIS, the European men-who-have-sex-with-men internet survey, has reported that a substantial proportion of persons in the east of the region are not 'out of the closet yet' and might therefore not have disclosed their sexuality to healthcare providers [14]. The EMIS survey also showed that STI screening procedures for MSM vary widely in Europe, with only a median of 16% in the study reporting anal swabbing as part of STI testing in the previous 12 months. All these factors have an impact on surveillance data and make it difficult to interpret the results.

The majority of countries that report gonorrhoea cases indicate that most of their data on STIs are obtained from dedicated specialist services (STI clinics). It is therefore likely that in many countries, a substantial proportion of cases, for example those diagnosed in primary healthcare, are not captured by surveillance systems. In addition, several countries obtain data through sentinel surveillance, which increases the degree of underestimation of the actual number of cases in the EU. Many cases are also either not diagnosed or not reported for various reasons such as differences in the availability of diagnostics so that the reported figures do not represent the true extent of this epidemic. Some of the increases reported over time could also be related to improvements in the coverage of surveillance systems and the use of more sensitive tests. Given the above limitations, comparisons between countries should be made with caution.

Public health implications

The decrease in the number of reported cases from the United Kingdom is encouraging, but rates of reported gonorrhoea infections are still high in many countries and continue to increase in the majority of the countries. There is an urgent need to further strengthen prevention activities aimed at, for example, increased testing uptake and testing frequency in those most at risk. This could be achieved by targeting specific risk groups with evidence-

based messages and methods. Social media and dating apps should be considered for prevention campaigns in addition to traditional approaches.

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