Chikungunya fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

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Key facts

- 1 461 cases were reported in TESSy in 2014; 875 of these cases were confirmed.
- Eleven (0.8%) cases were locally acquired in France, 1 406 were travel related, and the status of 44 cases was unknown.
- The EU/EEA notification rate in 2014 was 0.31 cases per 100 000 population.
- There was a 20-fold increase in the number of cases in 2014 compared with 2013 (72 cases), mainly due to travel-associated cases from the Caribbean and the Americas, where a large outbreak started in 2013.
- In October 2014, an outbreak of 11 confirmed autochthonous chikungunya cases was detected in Montpellier, France. This was the first outbreak of chikungunya fever in Europe since the 2007 Italian epidemic.
- The highest rates were reported in females; the age groups 25–44 years and 15–24 years had the highest rates for both genders.
- The number of cases increased during the summer holiday months and stayed relatively high during the second half of the year.

Methods

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- Of the 23 EU/EEA countries that reported chikungunya cases to TESSy, 10 reported zero cases. No data were available from Austria, Bulgaria, Cyprus, Denmark, Iceland, Liechtenstein, Norway and Portugal.

- Data for chikungunya fever reported within the EU/EEA are very heterogeneous as no specific case definition for chikungunya is available yet. Sixteen countries used the generic EU case definition for all viral haemorrhagic fevers, three countries did not specify which case definition was used (Belgium, Finland and France), and four countries used a different case definition (Czech Republic, Germany, Italy and the United Kingdom).

- Most reporting countries have a comprehensive surveillance system; the Netherlands uses a different type of system; no information was available from Sweden.

- Twenty countries reported having a compulsory notification system, whereas Belgium and the United Kingdom reported having a voluntary system. Sweden did not report this information.

- Disease surveillance for chikungunya is mostly passive except in the Czech Republic, Slovakia and the United Kingdom, where active systems are in place. The type of system is not specified in Sweden (Annex 1). Data reporting is case based and at the national level, with the Netherlands being the only exception.

Epidemiology

Most chikungunya fever cases were travel related (n=1406), 11 cases – all reported by France – were locally acquired, and for 44 cases the place of infection was unknown.

The 1 461 cases reported in 2014 represented a 20-fold increase compared with 2013. This was the highest number of cases reported for a single year since the start of reporting to TESSY in 2008 (Figure 4). The majority of cases was in people aged 25–44 years and 45–64 years. Most of the cases were reported as occurring during the summer months, but case numbers also remained high during the second half of the year.

The notification rate in 2014 (0.31 cases per 100 000 population) was much higher than in 2013 (0.02 per 100 000 population) and in previous years (Table 1).

The highest number of cases was reported in France (550), followed by the United Kingdom (301) and Spain (272), probably reflecting the travelling patterns to destinations with chikungunya outbreaks in 2014 (Figure 1).

Table 1. Reported chikungunya fever cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014				
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	2	0	2	0	0	0	0	0	.	.	.	.	.	.
Belgium	8	0.1	8	0.1	6	0.1	7	0.1	Y	C	74	0.7	0.7	74
Bulgaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Croatia	.	.	.	.	0	0	0	0	Y	C	0	0	0	0
Cyprus	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Czech Republic	0	0	0	0	0	0	0	0	Y	C	3	0	0	3
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Finland	1	0	0	0	0	0	1	0	Y	C	4	0.1	0.1	4
France	44	0.1	12	0	6	0	11	0	Y	C	550	0.8	0.9	247
Germany	37	0	13	0	9	0	16	0	Y	C	162	0.2	0.2	162
Greece	0	0	0	0	0	0	0	0	Y	C	1	0	0	1
Hungary	0	0	0	0	0	0	0	0	Y	C	2	0	0	1
Iceland	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ireland	1	0	0	0	0	0	0	0	Y	C	1	0	0	1
Italy	7	0	2	0	5	0	3	0	Y	C	39	0.1	0.1	39
Latvia	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Luxembourg	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Malta	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Netherlands	.	.	.	.	.	.	.	.	N	C	33	.	.	5
Norway	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Poland	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Portugal	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Romania	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Slovakia	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Slovenia	0	0	0	0	0	0	0	0	Y	C	0	0	0	0
Spain	0	-	4	-	2	-	2	-	Y	C	272	0.6	0.6	226
Sweden	0	0	0	0	2	0	6	0.1	Y	C	19	0.2	0.2	19
United Kingdom	79	0.1	14	0	21	0	26	0	Y	C	301	0.5	0.5	93
EU/EEA	**179**	**0.0**	**55**	**0.0**	**51**	**0.0**	**72**	**0.0**	**.**	**C**	**1461**	**0.3**	**0.3**	**875**

Source: Country reports. Legend: Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate

Figure 1. Number of reported chikungunya cases, EU/EEA, 2014

Source: Country reports from Belgium, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Age and gender distribution

Overall, 59.1% of cases were females with a notification rate of 0.37 per 100 000 compared with 0.26 per 100 000 in males; the male-to-female ratio was 0.7:1. The highest notification rate of chikungunya fever was observed in the 25–44- and 45–64-year-old age groups (0.43 and 0.45 per 100 000 population, respectively). In both age groups the rate was higher among females (0.54 and 0.53 cases per 100 000 population) than among males (0.32 and 0.35 cases per 100 000 population) (Figure 2). This pattern was also seen in 2013, although less pronounced.

Figure 2. Reported chikungunya cases, by age and gender, EU/EEA, 2014

Source: Country reports from Belgium, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Seasonality

Reporting of chikungunya cases sharply increased in April, peaking in June (n=225) and July (n=228), followed by a slow decrease. During the second half of the year the number of reported cases stayed relatively high, due to ongoing outbreaks in the Americas. Before 2014 (2010–2013) no clear seasonality could be detected for chikungunya in EU/EEA countries (Figure 3).

Figure 3. Seasonal distribution of reported chikungunya cases, EU/EEA, 2014 compared with 2010–2013 (minimum–maximum)

Source: Country reports from the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Enhanced surveillance in 2014

In 2014, importation status was available for 1 417 cases. Eleven of these cases (0.8 %) – all from France – were reported as locally acquired.

Among the travel-related cases that had information on probable country of infection (n=1 227), most were reported as being acquired in the Americas and the Caribbean (n=1 152; 94%). The distribution of cases reported as being acquired in the Caribbean is as follows: Dominican Republic (n=256, 21%), Guadeloupe (n=247, 20%), Martinique (n=170, 14%), Jamaica (n=105, 9%), Haiti (n=57, 5%) and French Guiana (n=50, 4%).

Among reported cases from 2013 with information on probable country of infection (n=59), most were acquired in the Philippines (n=16), India (n=15) and Indonesia (n=10).

Figure 4. Trend and number of reported chikungunya cases, EU/EEA, 2010–2014

Source: Country reports from the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Discussion

The number of reported chikungunya cases in the EU/EEA was markedly higher in 2014 compared with previous years. Higher case numbers can be linked to an ongoing outbreak in the Caribbean which resulted in a higher number of cases due to travel exposure.

Locally acquired cases of chikungunya were suspected in November 2013 and laboratory-confirmed in December 2013 in the Caribbean island of Saint Martin [1]. This was the first documented autochthonous transmission of chikungunya virus in the Caribbean. Chikungunya virus (Asian genotype) rapidly spread to the surrounding islands and reached, for the first time, South, Central and North America [2]. The Pan American Health Organization (PAHO) registered 1 118 678 cases in the Americas up to the end of 2014 (incidence rate 116 per 100,000 inhabitants). As of 20 November 2015, 596 893 cases were reported to PAHO [3]. Outbreaks were also reported in the Pacific region [4]. As a result of this widespread outbreak in the Americas, EU/EEA countries reported a 20-time increase in the total number of imported chikungunya cases in the EU in 2014 compared with the previous year (61 cases with information on probable country of infection in 2013).

The first identified outbreak of chikungunya fever in a temperate climate in 2007 in north-east Italy demonstrated the potential of the Aedes albopictus mosquito to transmit the virus at EU latitudes [5]. In 2010, indigenous transmission was reported for the second time in Europe, with the first two indigenous cases identified through enhanced surveillance in metropolitan France [6]. In 2011 and 2012, only imported cases of chikungunya were reported from EU and EEA countries.

In October 2014, an outbreak of 11 confirmed autochthonous chikungunya cases was detected in a district of Montpellier, a town in the south of France, which had been colonised by the vector *Aedes albopictus* since 2010. The primary case was a local resident who returned from Cameroon with an infection caused by a chikungunya virus of the East/Central/South African (ECSA) strain [7,8]. This was the first outbreak of chikungunya in Europe since the 2007 Italian epidemic. This new episode highlights the risk of locally acquired cases occurring in countries where competent Aedes mosquito vectors are established and where conditions are suitable for transmission, like in many Mediterranean countries of the EU [9].

Public health conclusions

Vigilance regarding imported cases of chikungunya and other diseases transmitted by Aedes mosquitoes and awareness among clinicians and travel clinic specialists should be raised in the EU, especially in areas where competent mosquito vectors are present and environmental conditions are suitable for transmission [9].

Preparedness plans to contain and/or mitigate the spread of chikungunya in the EU should include:

1. Strengthening of surveillance systems, including the adoption of a specific case definition and the rapid detection and notification of cases at local, national and international levels

2. Regular reviews of contingency plans for mosquito-borne outbreaks

3. Education and engagement of the general public in the control of mosquito breeding sites

4. Strengthening vector surveillance systems and rapid implementation of vector control measures around each case

5. Considering the adoption of blood safety measures in affected areas; measures should be aligned with the ones for West Nile virus infection.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases
ECDC chikungunya pages
ECDC factsheet for health professionals: chikungunya
ECDC vector distribution maps
ECDC mosquito-borne diseases in Europe

Annex

Table. Chikungunya fever, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Chlamydia

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Key facts

- In 2014, 396 128 cases of chlamydia infection were reported in 26 EU/EEA Member States.
- The overall notification rate was 187 per 100 000 persons.
- Notification rates of chlamydia infection vary considerably across Europe, with the highest country-specific rates more than 5 000 times the lowest rates. This is mainly a reflection of the differences in chlamydia testing and case finding rather than real differences in chlamydia prevalence.
- Notification rates continue to be highest among young adult women and heterosexuals.
- The overall trend appears stable over recent years, however varying trends are observed at the country level.

Methods

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In 2014, the majority of countries reported data based on EU case definitions; five countries reported data based on national case definitions, and four countries did not report which case definition they were using. Surveillance systems for chlamydia in Europe vary: 20 countries have comprehensive surveillance systems, and six have sentinel systems which only capture chlamydia diagnoses from a selection of clinics (Annex 1). Reporting of chlamydia infection is compulsory in those 20 countries that maintain a comprehensive surveillances system, while reporting is voluntary in those countries that maintain a sentinel systems.

In the analyses below, data from sentinel systems are not used in the calculation of rates as the coverage is not clear and denominators are therefore not available. In addition, cases are classified according to the date of diagnosis in all presented analyses. The use of incompatible age formats meant that data from the following countries were excluded from the analysis of age groups for the specified years: Austria (2007–2008), Hungary (2007–2008), and Poland (2006–2014). Lithuania did not report information on age between 2003 and 2007.

Epidemiology: geographic distribution

In 2014, 396 128 chlamydia infections were reported in 26 countries, with 83% of all cases reported in four countries (Denmark, Norway, Sweden and the United Kingdom) (Table 1). This resulted in an overall notification rate of 187 per 100 000 population for the 20 EU/EEA countries with comprehensive surveillance systems. The United Kingdom continues to contribute a large proportion of reported cases: 60% in 2014. This is due to the inclusion of data from a 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 has resulted in a large increase of chlamydia diagnoses from 2008 onwards.

Table 1: Number and rate of reported confirmed chlamydia cases per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	1095	-	1004	-	-	-	-	-	-	-
Belgium	3310	-	3566	-	4675	-	4983	-	5496	-
Bulgaria	49	0.7	55	0.7	131	1.8	323	4.4	495	6.8
Croatia					305	7.1	356	8.4	386	9.1
Cyprus	3	0.4	6	0.7	10	1.2	2	0.2	0	0
Czech Republic					-	-				
Denmark	27950	505	26617	478.7	26385	472.8	27683	494.1	30881	548.8
Estonia	1729	129.7	1775	133.5	1624	122.5	1580	119.7	1486	112.9
Finland	12825	239.7	13666	254.2	13247	245.3	13216	243.5	13246	243
France	9083	-	10969	-	13074	-	12932	-	14106	-
Germany										
Greece	657	5.9	502	4.5	396	3.6	486	4.4	388	3.6
Hungary	710	-	858	-	1060	-	1130	-	1121	-
Iceland	2197	691.7	2091	656.6	1918	600.2	2179	677	1723	529.1
Ireland	5399	118.7	6407	140.2	6182	134.9	6292	137	6583	142.9
Italy	736	-	715	-	946	-	953	-	940	-
Latvia	1000	47.2	1565	75.4	1747	85.4	2047	101.1	1945	97.2
Liechtenstein										
Lithuania	367	11.7	343	11.2	265	8.8	306	10.3	449	15.3
Luxembourg	2	0.4	1	0.2	4	0.8	2	0.4	0	0
Malta	138	33.3	146	35.2	157	37.6	134	31.8	98	23
Netherlands	11374		12917		14730		15794		17976	
Norway	22527	463.7	22530	457.9	21489	431	22249	440.5	24810	485.7
Poland	539	1.4	319	0.8	314	0.8	406	1.1	271	0.7
Portugal										
Romania	97	0.5	133	0.7	59	0.3	18	0.1	15	0.1
Slovakia	188	3.5	305	5.7	754	14	919	17	1029	19
Slovenia	176	8.6	232	11.3	249	12.1	248	12	270	13.1
Spain	947		1059		1033		1513		2350	-
Sweden	36932	395.4	37262	395.7	37773	398.3	34908	365.3	36126	374.6
United Kingdom	218469	349.5	216892	344.1	238713	376	238373	373	236424	367.6
EU/EEA	**358489**	**178.9**	**361935**	**178.3**	**387240**	**184.8**	**389032**	**184.5**	**396128**	**187.2**

Source: Country reports
Legend: - = rate not calculated because country has a sentinel surveillance system

In 2014, notification rates greater than 200 cases per 100 000 were observed in Denmark (549 per 100 000), Iceland (529), Norway (486), Sweden (375), the United Kingdom (368) and Finland (243) (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, Greece, Luxembourg, Poland and Romania).

Epidemiology: gender

The male-to-female ratio in 2014 was 0.7 (Figure 1); 231 540 cases were reported among women compared to 162 345 in men. Among countries with comprehensive surveillance systems, the overall notification rate was 156 per 100 000 in men and 240 per 100 000 in women. The male-to-female ratios, based on the number of cases, were below or close to 1 in the majority of countries. Male-to-female ratios above 1.5 were reported from four countries with comprehensive systems: Slovenia (1.9), Malta (2.2) and Poland (2.8); in addition no cases were reported among women in Romania. These countries report a relatively small number of cases. The lowest male-to-female ratios were reported by Greece (0.1) and Estonia (0.1).

Figure 1: Chlamydia male-to-female ratio in 23 EU/EEA countries, 2014

Note: Romania reported 15 cases of chlamydia among men and none among women.

Epidemiology: age

In 2014, information on age was not available from Croatia; data from Poland were excluded due to incompatible formats. These countries contributed 0.2% of all cases.

The largest proportion of cases reported in 2014 where among 20–24-year-olds, who accounted for 39% of cases. The second largest group was the age group 25–34 years, accounting for 25% of cases; young adults aged 15–24 accounted for almost two thirds of cases with known age (63%). This pattern was also reflected in the age-specific notification rates (Figure 2). The highest rates for 2014 were seen in the 20–24 year age group, with 1 058 cases per 100 000 reported by countries with comprehensive systems. Rates among 15–19-year-olds were also very high at 748 per 100 000 population. The highest overall rates were reported among women aged 20 to 24 years (1 144 cases per 100 000 persons) and 15 to 19 years (1 026 per 100 000 persons). Rates among men were highest among 20–24-year-olds (683 per 100 000 persons).

Figure 2. Rate of reported confirmed chlamydia cases per 100 000 population, by age and gender, EU/EEA, 2014

Source: Country reports from Bulgaria, Croatia, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Sweden, United Kingdom.

Epidemiology: transmission

In 2014, information on transmission category was available for 40% of reported cases of chlamydia infection (n=158 508). The low completeness for this variable is mainly a result of countries reporting high numbers of cases (Denmark, Norway, Finland and France) but not including data on transmission. When excluding countries that report transmission information for less than 60% of their case data (e.g. the United Kingdom, which reported transmission category data for 56% of cases), information on transmission was available for 57 267 cases from eight countries in 2014. Among these cases, 87% were indicated as heterosexual transmission, 7% were in men who have sex with men (MSM), and 6% of all transmissions were categorised as 'unknown' (Figure 3).

Figure 3. Percentage of chlamydia infections by transmission category and gender (n=57 267), EU/EEA, 2014

Note: Eight EU/EEA countries with ≥ 60% completeness in the transmission category

Data from Greece, Latvia, Lithuania, Malta, the Netherlands, Romania, Slovenia and Sweden

Epidemiology: trends 2005–2014

Between 2005 and 2014, 3 291 545 cases of chlamydia infection were reported from 27 countries. The completeness of reported data improved over time as surveillance systems were further developed in several countries during this period. The overall notification rate among countries with comprehensive surveillance systems increased from 165 cases per 100 000 in 2005 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 2005 and 2014 (Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Malta, Slovenia, Sweden and the United Kingdom) increased by 65% (from 202 to 333 cases per 100 000 population). Throughout this time period, rates among women have been consistently higher than among men, reflecting testing policies and practices across Europe (Figure 4).
Although the notification rate increased only moderately (5%) between 2010 and 2014, country-specific trends varied: some countries with lower chlamydia notification rates reported increases of over 50% in their rates (Bulgaria, Latvia, Slovakia, Slovenia); the countries with the highest chlamydia notification rates reported stable trends (Denmark, Finland, Norway, Sweden, United Kingdom); countries with low chlamydia notification rates reported decreasing trends (Greece, Iceland, Malta, Poland, Romania). Iceland, which until 2013 reported the highest rate in the EU/EEA, also reported a decrease.

Figure 4. Rate of reported confirmed chlamydia cases per 100 000 population, EU/EEA countries reporting consistently, 2005–2014

Source: Country reports from Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Malta, 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 has resulted in a large increase of chlamydia diagnoses from 2008 onwards.

Discussion

The overall rate of reported chlamydia diagnoses across Europe remains stable – but at a high level. Country-specific reported rates, however, continue to show a large variation. In 2014, the countries that reported the highest chlamydia notification also reported rates more than 5 000 times higher than the country with the lowest rate. Geographically, the highest rates – above 200 cases per 100 000 population – are reported by countries in the western and northern parts of the EU/EEA. Rates in many eastern and southern countries are below 30 cases per 100 000 population. On the other hand, data from population-based prevalence surveys show that rates of chlamydia infections in general populations are more homogenous across countries. Prevalence rates from these surveys are closest to surveillance notification rates in those countries that also reported the highest rates [1]. There are, however, limited data from those countries that reported the lowest surveillance notification rates. The large difference in reported notification rates is likely related to the variation in the availability of diagnostics, surveillance strategies, the degree of underreporting, testing policies and the degree of their effective implementation across Europe. These differences are highlighted by the fact that close to 90% of cases are reported by four countries. All of these countries have implemented either a chlamydia screening programme (e.g. the United Kingdom) or have implemented national opportunistic testing programmes [2]. The lack of data on testing rates limits the utility of surveillance data to understand the epidemiology of chlamydia infection at the European level. Data on the rate and distribution of testing are also helpful at the country level [3].

The distribution of chlamydia infection by gender and age also reflects the testing priorities across Europe: all but six countries reported more female than male cases in 2014. This indicates the continuing emphasis of clinicians on the diagnosis of chlamydia among women, where reproductive tract complications have significant public health impact. In addition, the majority of reported cases continue to be among young people between 15 and 24 years of age, suggesting that testing continues to be targeted towards groups at higher behavioural risk of sexually transmitted infections while simultaneously aiming to reduce the risks of reproductive tract complications. The large majority of cases are diagnosed among heterosexuals, while MSM account for 7% of cases reported with known transmission route.

The overall increase of cases in the past decade reflects the implementation of chlamydia control programmes together with improved diagnostic tools, the introduction and increased use of nucleic acid amplification tests (NAATs), increased case detection and improved surveillance systems [4]. The very low or decreasing notification rates in some eastern and central EU/EEA countries may be due to changes in healthcare systems (e.g. more private practices which may be more reluctant to report cases) [5]. In addition, there are still countries where NAAT technology is not yet widely available, and this hampers wider chlamydia case detection and case management.

Surveillance of chlamydia infection presents a number of challenges which make the interpretation of the epidemiological situation across the EU/EEA difficult: the asymptomatic nature of chlamydia infection, especially in women, can lead to underdiagnosis and – as discussed above – the number of cases reported depends heavily on national screening or testing policies and practices. Many cases in young people remain undiagnosed because asymptomatic young adults are often not specifically targeted for testing. In addition, even in countries with comprehensive systems, diagnosed cases may not be reported. These limitations mean that the distributions reported above, such as age and gender, should be interpreted with caution. Changes in testing and screening practices as well as surveillance systems also mean that trends should be viewed with caution. For example, the sharp increase in the overall notification rate in 2008 can be explained by additional data from a screening programme (targeted at 15–24-year-olds) in the United Kingdom, which captures data from community-based test settings as well as from STI services.

Surveillance approaches for chlamydia infection also vary across the EU/EEA, with many countries opting for sentinel systems, which makes comparisons at the European level difficult and prevents the inclusion of data in trend and other analyses. Also, the testing policies of countries reporting the largest numbers of cases significantly impact the overall notification rates and trends. The results reported above should therefore be viewed with these limitations in mind.

Public health conclusions

The high rate of reported chlamydia diagnoses among young adults indicates that further efforts are required: schools and higher education establishments should offer, for example, additional sex education classes and promote condom use. On the other hand, the large number of chlamydia diagnoses suggest that many chlamydia-related complications may be prevented through diagnosis and treatment at the individual level; on the community level, however, more evidence is needed on the effectiveness of widespread testing programmes in reducing prevalence of chlamydia infection and complication rates. The widely varying chlamydia notification rates across Europe indicate, however, that chlamydia testing programmes need to be strengthened in many countries to reduce risks to women's reproductive health.

Further development of chlamydia surveillance at the European level needs to take into account the limitations to current surveillance approaches. Member States may benefit from support in estimating the prevalence of chlamydia infection in their country, which would help to decide where testing programmes may best be introduced or expanded. Collecting more information on the coverage of surveillance systems as well as denominator testing data could give a better understanding of the burden of infection across Europe, taking into account the effects of different testing policies.

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Annex. Surveillance systems overview

Table. Chlamydia, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Congenital syphilis

Reporting on data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Congenital syphilis. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/syphilis/Pages/Annual-Epidemiological-Report---congenital-syphilis.aspx

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Key facts

- In 2014, 69 congenital syphilis cases were reported in 23 EU/EEA Member States, an overall rate of 2.3 cases per 100 000 live births.
- The trend for reported congenital syphilis cases has remained stable in recent years, but some countries reported small increases in reported cases compared with 2013.
- It is suspected that there is considerable underreporting: seven countries did not contribute to the reporting of congenital syphilis, and a further 13 reported zero cases in 2014.
- The low rates of congenital syphilis and decreasing rates of reported syphilis among women suggest that most Member States have programmes that aim at the elimination of congenital syphilis. Better indicator data are needed, however, to assess the effectiveness of antenatal screening programmes in all EU/EEA countries.

Methods

Click here for a detailed description of the methods used to produce this annual report

In 2014, the majority of countries reported data using EU case definitions. Two countries reported that they used national case definitions; three countries did not report which case definition they used. All reporting countries have comprehensive surveillance systems for congenital syphilis (Annex). Reporting of congenital syphilis infection was compulsory in all countries except the United Kingdom. Different case definitions were reported as being used across Europe: eight countries reported using 2008 and 2012 EU case definitions, two countries reported using the 2002 EU case definition, two countries reported using other case definitions, and three countries did not specify the case definition in use.

Please note that in all analyses, cases are categorised according to the date of diagnosis.

Epidemiology

In 2014, 69 confirmed cases of congenital syphilis were reported in 10 countries. Thirteen countries reported zero cases. The majority of the cases were reported from Bulgaria (24 cases) and Poland (17 cases). The number of congenital cases reported in 2014 was comparable to 2013 (72 cases). The number of reported cases continued to decrease in Bulgaria. The number of cases increased in Portugal, Romania and Spain compared with 2013, although numbers were small (Table 1). The overall rate of reported congenital syphilis infection was 2.3 cases per 100 000 live births. This is a slight increase over 2013 despite the fact that Germany did not report data and was therefore excluded from the denominator. The highest rates were observed in Bulgaria (36 cases per 100 000) and Portugal (12.1 cases per 100 000).

Table 1. Number and rate of reported congenital syphilis cases per 100 000 live births, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria										
Belgium										
Bulgaria	34	45	38	53.6	29	42	27	40.6	24	35.5
Croatia					0	0	0	0	0	0
Cyprus	0	0	0	0	0	0	0	0	0	0
Czech Republic	1	0.9	0	0	1	0.9	1	0.9	0	0
Denmark	0	0	0	0	0	0	0	0	1	1.8
Estonia	1	6.3	0	0	0	0	0	0	0	0
Finland										
France										
Germany	1	0.1	2	0.3	5	0.7	3	0.4		
Greece	2	1.7	3	2.8	0	0				
Hungary	1	1.1	0	0	0	0	2	2.2	1	1.1
Iceland	0	0	0	0	0	0	0	0	0	0
Ireland	1	1.3	0	0	0	0	0	0	0	0
Italy	13	2.3	7	1.3	5	0.9	7	1.4	1	0.2
Latvia		0	0	0	1	5	0	0	0	0
Liechtenstein										
Lithuania	2	6.5	0	0	1	3.3	2	6.7	1	3.3
Luxembourg	0	0	0	0	0	0	0	0	0	0
Malta	0	0	0	0	0	0	0	0	0	0
Netherlands										
Norway	0	0	0	0	0	0	0	0	0	0
Poland	18	4.4	14	3.6	32	8.3	19	5.1	17	4.5
Portugal	11	10.9	10	10.3	12	13.4	5	6	10	12.1
Romania	6	2.8	10	5.1	6	3	3	1.6	7	3.8
Slovakia	1	1.7	1	1.6	0	0	0	0	1	1.8
Slovenia	0	0	0	0	0	0	0	0	0	0
Spain	5	1	4	0.9	1	0.2	3	0.7	6	1.4
Sweden	1	0.9	1	0.9	1	0.9	0	0	0	0
United Kingdom	0	0	1	0.1	0	0	0	0	0	0
EU/EEA total	**98**	**2.4**	**91**	**2.3**	**94**	**2.4**	**72**	**1.9**	**69**	**2.3**

Source: Country reports
Legend: - = no report

Figure 1. Number of reported confirmed congenital syphilis cases per 100 000 live births; number of countries reporting congenital syphilis data, 25 EU/EEA countries, 2005–2014

Discussion

Congenital syphilis rates have been decreasing or stable in the EU/EEA since 2005. During this time, rates of syphilis among women have decreased consistently in the EU/EEA, contributing to the reduction of the risk of congenital transmission of syphilis. Data on the number of syphilis diagnoses during pregnancy are not collected routinely at a European level and it is therefore difficult to assess the efficiency of antenatal screening programmes from an EU perspective. In addition, underreporting of congenital syphilis is likely to be a problem in parts of Europe. In conjunction with its call for the elimination of congenital syphilis [1], the World Health Organization has identified four indicators to monitor programme progress:

- the proportion of women tested for syphilis at their first antenatal care visit;
- the proportion of pregnant women with a positive test for syphilis;
- antiretroviral coverage of HIV-positive pregnant women; and
- the proportion of syphilis-positive pregnant women treated for syphilis, ideally by week 24 of gestation.

These indicators allow countries to estimate programme effectiveness, defined as 'the estimated proportion of all syphilis-positive pregnant women treated by 24 weeks of gestational age' [2]. An ECDC project is currently investigating the effectiveness of national antenatal screening programmes.

Public health conclusions

Validation of the elimination of congenital syphilis in Europe is under way through efforts by the World Health Organization. Better surveillance data, including more information on the mothers of infants affected by congenital syphilis, is essential in order to understand where antenatal screening programmes are failing. The European congenital syphilis case definition is currently being updated to include still births related to syphilis infections in pregnancy. This will ensure optimal sensitivity for cases, which is essential at this stage of the elimination process.

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Annex. Surveillance systems overview

Table. Congenital syphilis, surveillance systems overview, 2014

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Crimean-Congo haemorrhagic fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Crimean-Congo haemorrhagic fever. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/emerging_and_vector-borne_diseases/tick_borne_diseases/crimean_congo/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- Nine Crimean-Congo haemorrhagic fever (CCHF) cases were reported in TESSy in 2014. Five of these cases were confirmed (56%).
- CCHF is endemic in the Balkan region; Bulgaria regularly reports a small number of cases.

Methods

Click here for a detailed description of the methods used to produce this annual report

• In 2014, 25 EU/EEA countries provided information on Crimean-Congo haemorrhagic fever (CCHF). Cases were reported from Bulgaria (n=8) and the United Kingdom (n=1), the rest of the countries reported zero cases.

• Twenty countries used the EU case definition, which is generic for all viral haemorrhagic fever cases, three countries used a different case definition (Germany, Italy and the United Kingdom). The case definition for two countries (Belgium and France) was unknown or not specified.

Epidemiology

Four confirmed case and four probable cases of CCHF were reported in 2014 from Bulgaria. One imported confirmed case – probably acquired in Bulgaria – was reported from the United Kingdom [1]. These nine cases (one in a woman, the rest in men) were notified between June and August 2014. Five cases were in the 45–64-year-old age group.

CCHF is endemic in the Balkan region, where Bulgaria regularly reports a small number of cases (six cases in 2010, four in 2011, five in 2012, and eight in 2013).

Discussion

Crimean-Congo haemorrhagic fever is a zoonotic tick-borne disease infecting a large variety of domestic and wild animals, but only humans present clinical symptoms. Humans can be infected by contact with blood from viraemic animals and through human-to-human transmission, in particularly during nosocomial outbreaks.

CCHF is endemic in the Balkan region and a few sporadic cases are reported on a regular basis from Bulgaria. In the WHO European Region, Turkey remains the country that is most affected. The main vector for Crimean-Congo haemorrhagic fever, the tick Hyalomma marginatum, has a wide distribution in Europe [2]. Using an ecological niche modelling approach, most suitable areas for CCHF transmission in the Balkans have been identified [3].

In 2012, an imported case was diagnosed in Scotland. This fatal case had travelled by air from Kabul, Afghanistan, via Dubai to London [4]. CCHF is endemic in Africa, the Balkans, the Middle East, and western and south-central Asia. The septentrional limit of the main tick vector lies south of the 50th northern parallel. In Europe, cases of human infection have been reported from Albania, Bulgaria, Greece, Kosovo, Serbia, Turkey, Armenia, Georgia, Ukraine, Federation of Russia, as well as from Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan.

Public health conclusions

Crimean-Congo haemorrhagic fever has the potential for human-to-human transmission. Early detection of cases (clinically and in the laboratory) is essential for the implementation of protective measures and initiation of treatment [5].

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Annex

Table. Crimean-Congo haemorrhagic fever, surveillance systems overview, 2014

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Dengue fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015
Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Dengue fever. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/dengue_fever/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- A total of 1 796 cases of dengue fever were reported in TESSy in 2014; 1 510 of these cases were confirmed.
- Notification rate in 2014 was 0.42 cases per 100 000 population.
- Almost all cases were travel related, four cases were locally acquired; for 76 cases, the place of infection was unknown.
- The number of cases was lower compared with 2013, but still higher than in the previous years.
- The highest rates were reported in men 25–44 years of age and in women 15–24 and 25–44 years of age.
- The number of cases increased during the summer holidays, most probably reflecting travel habits of EU populations in summer.

Methods

Click here for a detailed description of the methods used to produce this annual report

• 25 EU/EEA countries reported data on dengue fever. Five of these countries reported zero cases (Czech Republic, Iceland, Luxembourg, Malta and Slovakia). No data were reported by Bulgaria, Cyprus, Denmark, Estonia, Liechtenstein, Portugal and Spain.

• Data for dengue reported within the EU/EEA are very heterogeneous as no specific case definition is available. Sixteen countries referred to the EU generic case definition for viral haemorrhagic fevers, three countries did not specify which case definition was used (Belgium, France and Germany), and five countries used other case definitions (Czech Republic, Germany, Italy, the Netherlands and the United Kingdom).

• All reporting countries except the Netherlands have a comprehensive surveillance system. Reporting is compulsory in 23 countries and voluntary in two (Belgium and the United Kingdom). Surveillance is mostly passive except in Belgium, the Czech Republic, Slovakia and the United Kingdom, where active systems are in place (Annex 1). Data reporting is case based (except in Croatia) and coverage is national (except in the Netherlands).

Epidemiology

Most dengue cases were reported as travel-related cases. France reported four locally acquired cases in 2014. In 2013, two locally acquired cases were reported, one in France and one with a travel history to Madeira, where a large outbreak was reported in 2012–2013 [1].

The notification rate in 2014 was 0.42 cases per 100 000 population. The highest rates were observed in the age groups 15–24 and 25–44 years. The notification rate was higher among women between 15 and 24 years of age.

Case numbers increased during the summer months.

The number of cases in 2014 was lower than in 2013, but still higher than in the years before. Similarly, the notification rate in 2014 (0.42 cases per 100 000 population) was lower than in 2013 (0.53 cases per 100 000 population), but higher than between 2010 and 2012 (Table 1).

The highest number of reported cases in 2014 was observed in Germany (n=626), followed by the United Kingdom (n=376) and France (n=212) (Table 1, Figure 1). The countries that used to report most dengue cases (Germany, France, Sweden, the United Kingdom, Belgium, Italy and Finland) reported fewer cases in 2014 compared with 2013.

Table 1. Reported dengue fever cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR*	Confirmed cases
Austria	11	0.1	0	0.0	2	0.0	89	1.1	Y	C	91	1.1	1.1	91
Belgium	129	1.2	41	0.4	73	0.7	139	1.2	Y	C	110	1.0	1.0	110
Bulgaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Croatia	.	.	.	.	1	0.0	3	0.1	Y	A	2	0.0	0.0	2
Cyprus	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Czech Republic	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	9	0.7	0.7	9
Finland	50	0.9	45	0.8	90	1.7	80	1.5	Y	C	38	0.7	0.8	38
France	596	0.9	55	0.1	110	0.2	271	0.4	Y	C	212	0.3	0.3	85
Germany	595	0.7	288	0.4	616	0.8	878	1.1	Y	C	626	0.8	0.8	626
Greece	0	0.0	0	0	0	0.0	1	0.0	Y	C	4	0.0	0.0	4
Hungary	7	0.1	2	0.0	3	0.0	10	0.1	Y	C	6	0.1	0.1	2
Iceland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Ireland	0	0.0	0	0.0	7	0.2	15	0.3	Y	C	21	0.5	0.5	21
Italy	51	0.1	44	0.1	74	0.1	142	0.2	Y	C	79	0.1	0.1	79
Latvia	8	0.4	2	0.1	7	0.3	7	0.3	Y	C	1	0.0	0.1	1
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0.0	1	0.0	0	0.0	1	0.0	Y	C	3	0.1	0.1	3
Luxembourg	2	0.4	1	0.2	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Malta	1	0.2	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Netherlands	.	.	.	.	.	.	.	.	N	C	3	-	-	0
Norway	.	.	.	.	30	0.6	57	1.1	Y	C	73	1.4	1.5	73
Poland	6	0.0	5	0.0	5	0.0	13	0.0	Y	C	15	0.0	0.0	5
Portugal	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Romania	0	0.0	2	0.0	3	0.0	6	0.0	Y	C	6	0.0	0.0	6
Slovakia	0	0.0	0	0.0	3	0.1	4	0.1	Y	C	0	0.0	0.0	0
Slovenia	8	0.4	8	0.4	10	0.5	8	0.4	Y	C	2	0.1	0.1	2
Spain	0	0.0	0	0.0	0	0.0	0	0.0	.	.	.	.	.	.
Sweden	151	1.6	103	1.1	175	1.8	220	2.3	Y	C	119	1.2	1.3	119
United Kingdom	7	0.0	13	0.0	0	0.0	571	0.9	Y	C	376	0.6	0.6	234
EU/EEA	**1622**	**0.4**	**610**	**0.1**	**1209**	**0.3**	**2515**	**0.5**	**.**	**C**	**1796**	**0.4**	**0.4**	**1510**

Source: Country reports. Legend: A = aggregated, Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate

Figure 1. Number of reported dengue cases, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Sweden, the United Kingdom.

Age and gender distribution

Fifty-two per cent of cases were males, with a male-to-female ratio of 1.1:1. The majority of cases were 25–44 years old (n=876; 48.8%). In the age group 15–24 years, the proportion of females was markedly higher.

Figure 2. Reported dengue fever cases: rate by age and gender, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Sweden, the United Kingdom.

Seasonality

The number of dengue cases was highest during the summer months (June to August, with a peak in August). A smaller peak was seen in January, possibly related to the winter holiday period. In 2014, more cases were seen in June and July compared with the average number of cases in 2010–2013 (Figure 4) but this pattern varied by country. In Sweden and Finland, the peak was strongest at the beginning of the year (Jan–April), with a smaller peak in July, while France, Germany and Italy reported peaks in August–September.

Figure 3. Seasonal distribution of reported dengue cases, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Sweden, the United Kingdom.

Enhanced surveillance in 2014

Information on importation status was available for 1 718 cases. Four cases (0.2%) were locally acquired in France. These autochthonous cases were reported in the Provence-Alpes-Côte-d'Azur region, two cases in Var district and two cases in Bouches-du-Rhône district [2]. In 2013, one autochthonous case was reported in Bouches-du-Rhône district [3].

In 2014, most of the 1 403 cases for which travel information was available were infected in Thailand (n=380, 27%), Indonesia (n=171), India (n=110), Malaysia (n=71), the Philippines (n=58) and Tanzania (n=80). Compared with the period 2010–2013, cases related to travel in Tanzania – mainly reported by the United Kingdom – showed the greatest increase.

In 2013, most of the 2 040 cases with travel information were infected in Thailand (n=722, 35%), Indonesia (n=180), India (n=166), Philippines (n=58), Brazil (n=58) and Barbados (n=68).

Trend

After a high number of cases in 2013, the number of cases in 2014 decreased, but remained at a higher level than in the years before (Figure 6).

Figure 4. Trend and number of reported dengue cases, EU/EEA, 2010–2014

Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Sweden, the United Kingdom.

Discussion

Travel-related dengue fever in the EU reflects the evolution of dengue situation in tropical regions where the disease is endemic. Although the case numbers returned to a lower level after 2010, the end of 2012 and 2013 were marked by a strong increase, which is probably related to several dengue outbreaks in tropical countries.

Patterns in the occurrence of dengue cases, e.g. by age and gender, most likely reflect population travel patterns rather than other risk factors. Also, differences in seasonality most likely reflect national travel patterns.

South-east Asia and Latin America reported an increasing numbers of cases. In Asia, Japan experienced an outbreak of dengue which lasted until mid-October 2014 [4]. The majority of cases was associated with visiting Yoyogi Park in Tokyo [5]. It seems that this was the first dengue epidemic in Japan since 1945. One imported case from Japan was detected in 2013 in Germany [6], and in 2014 an imported case from Japan was reported by the United Kingdom. In China, nearly 40 000 dengue cases were reported in southern provinces, where Guangxi Zhuang Autonomous Region and Guangdong Province were the most affected [7]. In Africa, dengue outbreaks were reported in Tanzania, in Mozambique in April, and in Sudan (North Darfur) in October. Dengue outbreaks were reported in several islands in the Pacific.

Recently reported autochthonous transmission of dengue fever in France and Japan highlights the risk of locally-acquired cases in countries where competent Aedes mosquito vectors are established and where conditions are suitable for transmission, like in many Mediterranean countries of the EU [8].

Public health conclusions

Vigilance regarding imported cases of dengue and other diseases transmitted by Aedes mosquitoes and awareness among clinicians and travel clinic specialists should be raised in the EU, especially in areas where competent mosquito vectors are present and environmental conditions are suitable for transmission [8].

Preparedness plans to contain and/or mitigate the spread of dengue in the EU should include:

1. Strengthening of surveillance systems, including the adoption of a specific case definition and the rapid detection and notification of cases at local, national and international levels

2. Regular reviews of contingency plans for mosquito-borne outbreaks

3. Education and engagement of the general public in the control of mosquito breeding sites

4. Strengthening vector surveillance systems and rapid implementation of vector control measures around each case

5. Considering the adoption of blood safety measures in affected areas; measures should be aligned with the ones for West Nile virus infection.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annex

Table. Dengue fever, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Diphtheria

Reporting on 2014 data retrieved from TESSy* on 7 July 2016
Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Diphtheria. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/Diphtheria/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 38 cases of diphtheria were reported to TESSy, 35 of which were laboratory confirmed as due to C. diphtheriae or C. ulcerans.
- Adults and elderly were the most affected.
- The majority of the cases were not vaccinated or the vaccination status was reported as unknown.
- Latvia was the only country in the EU to report indigenous cases.
- High vaccination coverage must be sustained to prevent diphtheria cases.

Methods

Click here for a detailed description of the methods used to produce this annual report

ECDC has coordinated the surveillance of diphtheria at the EU level since the transfer of DIPNET, the Diphtheria Surveillance Network, to ECDC in 2010. DIPNET used to be hosted at the UK Health Protection Agency.

• In 2014, 30 EU/EEA Member States reported data. Nine countries reported cases due to C. diphtheriae or C. ulcerans, and 21 countries reported zero cases.

• The majority of Member States reported data on diphtheria according to the 2008 (n=13) or 2012 (n=11) EU case definition. Five countries used an alternative or unspecified case definition. Regardless of the case definition used, only cases caused by, or with a clinical syndrome consistent with causation by, toxigenic strains are reported at the EU level (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council).

• All reporting countries have a surveillance system for diphtheria and reported case-based data. Clinical and laboratory-notified cases were linked at the national level and submitted to TESSy with a single record identifier. The majority of the countries reported data based on a comprehensive (n=30) and compulsory (n=29) surveillance system. For a summary of national surveillance systems characteristics by country, please refer to the Annex.

Epidemiology

Thirty-eight cases of diphtheria were reported in 2014 (Table 1, Figure 1), 35 of which were laboratory confirmed as due to C. diphtheriae (n=22) or C. ulcerans, (n=13). The overall notification rate was <0.01 per 100 000 population. Additionally, Latvia reported three cases as possible C. diphtheriae respiratory infections. Of the 22 confirmed C. diphtheriae cases, Latvia reported the highest number (n=10) and was the only EU Member State with continued indigenous transmission. Diphtheria caused by C. ulcerans accounted for 13 cases and was reported by Germany (n=5), France (n=5), Italy (n=1), Sweden (n=1) and the United Kingdom (n=1).

From 2010 to 2014, 131 cases of diphtheria were reported in the EU/EEA; 76 of these cases were laboratory-confirmed C. diphtheriae infections. The number of C. diphtheriae cases reported over the last four years increased, especially in Latvia (n=42, 38 of these cases were laboratory confirmed).

Table 1. Reported diphtheria cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	2	0.0	0.0	2
Belgium	0	0.0	0	0.0	1	0.0	1	0.0	Y	C	0	0.0	0.0	0
Bulgaria	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Croatia	.	.	.	.	.	.	0	0.0	Y	C	0	0.0	0.0	0
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Czech Republic	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Denmark	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Estonia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Finland	0	0.0	0	0.0	1	0.0	0	0.0	Y	C	0	0.0	0.0	0
France	2	0.0	5	0.0	4	0.0	6	0.0	Y	C	6	0.0	0.0	6
Germany	8	0.0	4	0.0	9	0.0	4	0.0	Y	C	8	0.0	0.0	8
Greece	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Hungary	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Iceland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Italy	0	0.0	0	0.0	0	0.0	1	0.0	Y	C	1	0.0	0.0	1
Latvia	2	0.1	6	0.3	8	0.4	14	0.7	Y	C	13	0.6	0.6	10
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0.0	1	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Netherlands	0	0.0	0	0.0	1	0.0	0	0.0	Y	C	1	0.0	0.0	1
Norway	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	2	0.0	0.0	2
Poland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Portugal	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Romania	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Slovakia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Slovenia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Spain	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	1	0.0	0.0	1
Sweden	0	0.0	2	0.0	2	0.0	2	0.0	Y	C	3	0.0	0.0	3
United Kingdom	2	0.0	2	0.0	1	0.0	4	0.0	Y	C	1	0.0	0.0	1
EU/EEA	**14**	**0.0**	**20**	**0.0**	**27**	**0.0**	**32**	**0.0**	**.**	**C**	**38**	**0.0**	**0.0**	**35**

Source: Country reports. Legend: Y = yes, N = no, C = case based, ' ' = no report, ASR: age-standardised rate

Figure 1. Number of reported diphtheria cases, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, 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.

Age and gender distribution

In 2014, all age groups were affected, with a preponderance in adults and the elderly. Regarding C. diphtheriae, 13 of the 22 confirmed cases were aged 25 years and over: five were aged 45–64 years and four 65 years and over). Fifteen of the 22 cases were male. For C. ulcerans, all cases (n=13) were reported in adults 45 years or over, except one case reported in a 13-year-old female. The cases were almost equally distributed between males (n=7) and females (n=6).

Figure 2. Reported diphtheria cases, by age and gender, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, 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.

Seasonality

The low number of reported cases does not allow analysis of seasonal variation. In 2014, cases were reported throughout the year.

Clinical presentation and origin of infection

Ten of the confirmed C. diphtheriae cases were reported as respiratory diphtheria and ten as cutaneous infections. For two confirmed C. diphtheriae cases, the clinical presentation was not reported.

Eleven cases were reported as imported. The probable countries of infection of nine of the imported cases were Afghanistan, Angola, Ethiopia, Mozambique, Madagascar, Sri Lanka, Somalia and Thailand (2). For one case, the probable country of infection was reported as Cambodia, Laos, Malaysia or Thailand. All 10 cases of confirmed C. diphtheriae reported by Latvia were reported as not imported. One confirmed C. diphtheriae case had an unknown importation status. The clinical presentation of cases due to C. ulcerans was not reported, except one case reported as cutaneous diphtheria.

Outcome

Among the 37 cases for which information on outcome was available, one death was reported due to C. ulcerans in an 88-year-old woman.

Vaccination status

Vaccination status was reported for 16 cases of confirmed C. diphtheriae. Eight cases were reported as not vaccinated, one as vaccinated with three doses, one with four doses and four with five doses; two cases were vaccinated with an unknown number of doses. In Latvia, among the 10 laboratory-confirmed cases due to C. diphtheria, six cases were reported as not vaccinated, two cases had an unknown vaccination status, one 34-year old case was vaccinated with three doses, and one 37-year-old case was vaccinated with five doses.

Of all the cases reported in the EU due to C. ulcerans, one was not vaccinated, one was vaccinated with three doses (aged 65 years), three were vaccinated with an unknown number of doses (aged 13, 58 and 63 years), and eight had an unknown vaccination status.

Discussion

Diphtheria is a transmissible bacterial disease primarily infecting the pharynx, larynx, tonsils and nose. Occasionally, the bacteria affects skin or mucous membranes including conjunctivae and the vagina.

The causative agent of diphtheria is Corynebacterium diphtheriae transmitted through droplets during close contact. The bacterium produces a toxin that can cause severe complications. Systemic toxicity occurs in 8.1% of diphtheria patients, which may lead to severe complications such myocarditis, neuropathies, renal failure and eventually death.

Other corynebacteria, C. ulcerans and very rarely C. pseudotuberculosis, may produce the diphtheria toxin, although the strains appear to belong to distinct species and have different routes of transmission [1].

Diphtheria case detection is strongly influenced by the availability of laboratory resources (techniques and supplies), clinical expertise and surveillance systems. As ECDC surveillance data and EQA reports have shown, the availability of these resources seems to be unevenly distributed in Europe, and very few countries perform toxigenicity testing [2].

It is likely that countries that reported cases in consecutive years (Austria, France, Germany, Latvia, Lithuania, Norway, Spain, Sweden and United Kingdom) have acquired stronger expertise and laboratory capacity for detecting and confirming diphtheria cases than countries that did not detect and report cases. C ulcerans infections were reported by Germany, France, Italy, Sweden and the United Kingdom, perhaps suggesting a higher level of awareness of this pathogen in these countries [3].

While in 2010 only three C. diphtheriae cases were reported, ECDC received information on 22 confirmed cases in 2014.

Latvia is the only EU Member State with continued indigenous transmission, probably due to decreasing adult booster coverage [4]. Though the clinical presentation was not always reported, a notable increase of cases was reported with cutaneous manifestation, mainly among adult travellers.

Because the risks of transmission from cases with respiratory or cutaneous forms continue, particularly in countries outside the EU, high vaccination coverage must be maintained [5,6].

European travellers may become infected and develop cutaneous diphtheria while travelling or working in endemic countries. ECDC data show that most of the imported cases had not received booster vaccinations before travelling. If travellers are not vaccinated or exposed to overcrowding and poor hygienic conditions, they are at potential risk for acquiring diphtheria and of transmitting the infection on their return [6].

The diphtheria toxoid vaccine effectively protects against the effects of the exotoxin produced by C. diphtheriae, and immunisation is the only effective method of preventing the toxin-mediated disease. Since the reported vaccination coverage is high in Europe, the threat of a widespread outbreak is unlikely, but sporadic cases may continue to occur in unvaccinated or partially vaccinated individuals [5,7,8].

Public health conclusions

Enhanced diphtheria surveillance with high data completeness must be maintained. Also, early medical diagnosis (clinical recognition and laboratory confirmation) and treatment should be in place. As early administration of diphtheria antitoxin (DAT) is essential for survival, countries must maintain the capacity for rapid investigation and management of close contacts of cases. Not all EU countries have their own stocks of DAT, thus timely transfer of available stocks to affected countries is essential; arrangements need to be in place to ensure that the transfer of DAT stocks is possible on short notice [5,8].

Maintaining high vaccination coverage in the population is critical, and measures should be taken to improve vaccination coverage rates in under-vaccinated populations and certain risk groups (e.g. travellers planning to go to endemic areas and contacts of unvaccinated travellers returning from endemic areas, overcrowded closed groups of people under poor hygienic conditions, unvaccinated clusters and the elderly [6]. Particular attention should also be given to revaccination of healthcare and social workers due to waning immunity, revaccination of adult population against diphtheria every 10 years might be considered [9].

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Annex

Table. Diphtheria, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Ebola and Marburg fevers

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Ebola and Marburg fevers. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/ebola_marburg_fevers/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- Eight confirmed cases of Ebola viral haemorrhagic fever infections were reported in EU/EEA countries in 2014. No cases of Marburg haemorrhagic fever were reported.
- 2014 was the first year that Ebola viral haemorrhagic fever infections were notified in TESSy, prompted by an outbreak in West Africa.
- Seven cases were travel related, one case was locally acquired in Spain. Three of these patients died.

Methods

Click here for a detailed description of the methods used to produce this annual report

- Surveillance of Ebola was mainly conducted through epidemic intelligence activities, including the collection of extensive information on infected EU citizens.
- This report is based on information reported to TESSy and additional information available from epidemic intelligence.
- 26 EU/EEA countries reported data to TESSy in 2014.
- 18 countries use the EU case definition, four countries (the Czech Republic, Denmark, Germany and the United Kingdom) used different case definitions, and Belgium, Cyprus, Finland and France did not specify the case definition they used.
- Reporting is compulsory in 24 countries, on a voluntary basis in the United Kingdom, and 'not specified' in Cyprus. Surveillance is comprehensive ('not specified' in Cyprus) and mostly passive (22 countries, except for the Czech Republic, Slovakia and the United Kingdom; 'not specified' in Cyprus) (Annex 1). Reporting is case based and done at the national level.

Epidemiology

In 2014, eight cases were reported in EU/EAA countries, five males and three females. Five cases were in the age group 25–44 years, one in the age group 45–64 years, and two patients were over 65 years old. 2014 was the first year that Ebola viral haemorrhagic fever infections were reported in TESSy.

The cases were reported by Germany (n=2), Norway (n=1) Spain (n=3) and United Kingdom (n=2). Seven of the cases were travel related, probably infected in Sierra Leone (n=5) and Liberia (n=2). One case, a woman in Spain, was locally infected (nosocomial infection). Three of these patients died.

Discussion

In March 2014, an outbreak of Zaire Ebola virus was reported in eastern Guinea. The disease spread rapidly to neighbouring countries (Sierra Leone and Liberia) and on to Nigeria and Senegal [1]. On 8 August 2014, WHO declared the Ebola epidemic in West Africa a Public Health Emergency of International Concern [2]. As of 2 December 2015, WHO reported 28 601 cases of Ebola virus disease related to the outbreak in West Africa, including 11 300 deaths. The number of cases in the most affected countries peaked in autumn 2014 and slowly decreased after that. WHO declared Sierra Leone 'Ebola-free' on 7 November 2015.

The risk of spread, regionally and globally, remains until all countries in West Africa are declared Ebola-free. However, long-term persistence of the virus in survivors may cause a number of late infections which could occur several months after a country has been declared Ebola-free [3].

Although exposure to infected wildlife animals or animal products is the usual source of infection and the start of the chain of transmission, the initial source of infection of this outbreak remains unknown.

This is the first outbreak of Ebola virus in West Africa and the worst Ebola outbreak ever reported. Another unrelated outbreak, also due to Zaire Ebola virus, was reported from 26 July to 7 October 2014 in Equateur province, Democratic Republic of Congo. A total of 69 cases were reported, eight among healthcare workers. The death toll was 49 [4].

Many healthcare workers were infected while treating patients with Ebola or Marburg infection. As of 21 June 2015, 872 confirmed cases among healthcare workers were reported in Guinea, Liberia and Sierra Leone since the start of the outbreak, 507 of these cases (58%) were fatal.

Outside of the three most-affected countries, infected healthcare workers were reported from Mali (2), Nigeria (11), Spain (1, infected while caring for an evacuated Ebola patient), UK (two, both infected in Sierra Leone), USA (two infected in Sierra Leone, two in Liberia, and two while caring for a confirmed Ebola case in a Texas hospital), and Italy (one, infected in Sierra Leone) [5].

Multiple outbreaks of Ebola virus and Marburg virus infection have been identified since their initial discovery. From 1976 to 2012, 2 387 cases of Ebola virus infections and 1 590 deaths were reported (case fatality rate [CFR] 66.6%). From 1967 to 2012, 571 cases of Marburg virus infections were reported, including 470 deaths (CFR 82.3%). Outbreaks of Ebola virus disease were reported mainly in the Democratic Republic of Congo, Congo, Gabon and Sudan. Outbreaks of Marburg virus disease occurred in Kenya, Uganda and Angola. In 2008, two tourists (one from the USA and one from the Netherlands) became infected after visiting, several months apart, a cave in Maramagambo forest in Uganda. One of the cases died [3,6,7].

Public health conclusions

There are currently no licensed Ebola vaccines but several potential candidate vaccines are undergoing evaluation [8].

The goal of outbreak control is to interrupt direct human-to-human transmission through the early identification and systematic isolation of cases, timely contact-tracing, proper personal protection, safely conducted burials, improved community awareness about risk factors of viral infection, and individual protective measures. Quarantine of infected patients has been shown to effectively stop the spread of the disease in previous outbreaks.

Many healthcare workers were infected while treating patients with Ebola or Marburg infection because of close contact with patients when infection control precautions were not strictly practiced or haemorrhagic viral aetiology was not recognised. Implementation of appropriate infection control measures in healthcare settings, including use of personal protective equipment, is effective in minimising the risk for transmission of filoviruses [5,9].

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Additional information

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Annex

Table. Ebola or Marburg viral haemorrhagic fever disease, surveillance systems overview, 2014

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Gonorrhoea

Reporting on data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Gonorrhoea. [Internet]. Stockholm:

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Key facts

- In 2014, 66 413 cases of gonorrhoea infection were reported by 27 EU/EEA Member States.
- The overall notification rate was 20 cases per 100 000 population.
- Rates of reported gonorrhoea infection vary considerably across Europe, with higher rates in northern Europe.
- Men who have sex with men (MSM) account for 44% of reported gonorrhoea diagnoses in the EU/EEA, which is only slightly lower than the proportion contributed by male and female heterosexuals together (49%).
- The number of reported cases continue to increase – by 25% compared with 2013. Increases were reported in all groups, but particularly in MSM.

Methods

Click here for a detailed description of the methods used to produce this annual report

In 2014, the majority of countries reported data using EU case definitions. Four 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; four have sentinel systems that only capture gonorrhoea diagnoses from a selection of clinics (Annex 1). Reporting of gonorrhoea infection is compulsory in 23 countries. Most countries operate comprehensive systems, with the exception of Hungary (compulsory notification based on a sentinel system), the United Kingdom (compulsory notification, 'other' surveillance system) and Belgium, France and the Netherlands (voluntary reporting, sentinel systems).

In the analyses below, data from sentinel systems are not used in the calculation of national or overall rates because the coverage is not always clear and denominators are therefore not available. In addition, cases are classified according to the date of diagnosis in all presented analyses. Due to incompatibilities in data presentation and age formats, data from the following countries and periods were excluded from all types of analyses that involve age groups (excluded periods are given in brackets): Hungary (2007–2008), Poland (2006–2014) and Romania (2006).

Epidemiology: demographic variables

In 2014, 66 413 gonorrhoea cases were reported in 27 countries, an increase of 25% in the number of reported cases compared with 2013. The United Kingdom reported 58% of all cases in 2014 (Table 1). The notification rate in 2014 was 20 per 100 000 population for countries with comprehensive surveillance systems. The highest rates observed in 2014 (>15/100 000 population) were in the United Kingdom (60 per 100 000), Ireland (28), Denmark (20) and Latvia (18). The lowest rates (≤1 per 100 000) were observed in Croatia, Cyprus, Luxembourg and Romania. Figure 1 displays the distribution of gonorrhoea rates among countries reporting from comprehensive surveillance systems.

Table 1: Number and rate of reported confirmed gonorrhoea cases per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	331	-	470	-	402	-	1148	-		
Belgium	752	-	842	-	931	-	1011	-	1119	-
Bulgaria	184	2.5	197	2.7	99	1.4	96	1.3	170	2.3
Croatia					14	0.3	14	0.3	22	0.5
Cyprus	23	2.8	11	1.3	6	0.7	2	0.2	4	0.5
Czech Republic	749	7.2	714	6.8	1142	10.9	1407	13.4	1385	13.2
Denmark	462	8.7	501	9	673	12.1	817	14.6	1141	20.3
Estonia	118	8.9	173	13	215	16.2	133	10.1	134	10.2
Finland	255	4.8	289	5.4	312	5.8	267	4.9	286	5.2
France	534	-	737	-	936	-	1349	-	1330	-
Germany										
Greece	312	2.8	378	3.4	238	2.1	219	2	245	2.2
Hungary	1170		1369	-	1487	-	1526		1620	-
Iceland	18	5.7	32	10	29	9.1	19	5.9	38	11.7
Ireland	625	13.7	834	18.2	1139	24.9	1273	27.7	1304	28.3
Italy	365	0.6	356	0.6	289	0.5				
Latvia	349	16.5	545	26.3	607	29.7	554	27.4	365	18.2
Liechtenstein										
Lithuania	315	10	248	8.1	219	7.3	190	6.4	165	5.6
Luxembourg	3	0.6	2	0.4	5	1	4	0.7	5	0.9
Malta	48	11.6	46	11.1	29	6.9	62	14.7	51	12
Netherlands	2815	-	3576	-	3996		4171		10729	
Norway	412	8.5	368	7.5	443	8.9	506	10	682	13.4
Poland	301	0.8	298	0.8	733	1.9	549	1.4	495	1.3
Portugal	89	0.8	120	1.1	120	1.1	121	1.2	201	1.9
Romania	479	2.4	510	2.5	323	1.6	340	1.7	178	0.9
Slovakia	130	2.4	212	3.9	286	5.3	378	7	423	7.8
Slovenia	44	2.1	25	1.2	45	2.2	62	3	61	3
Spain	2306	5	2640	5.7	3044	6.5	3315	7.1	4562	9.8
Sweden	847	9.1	952	10.1	1090	11.5	1110	11.6	1337	13.9
United Kingdom	18710	29.9	23372	37.1	28779	45.3	32493	50.8	38361	59.7
EU/EEA total	**32766**	**8.7**	**39817**	**10.5**	**47631**	**12.6**	**53136**	**17**	**66413**	**20**

Source: Country reports
Legend: - = rate not calculated because country has a sentinel surveillance system

Figure 1. Rate of reported confirmed gonorrhoea cases per 100 000 population, EU/EEA, 2014

The male-to-female ratio in 2014 was 2.7:1 (Figure 2). The rate was 35 per 100 000 among men (45 328 cases) and 10 per 100 000 among women (16 490 cases). Only Estonia reported a male-to-female ratio below 2 (0.7:1). The highest male-to-female ratio was reported by Greece (14.1:1).

Figure 2: Gonorrhoea male-to-female ratio in 25 EU/EEA countries, 2014

In 2014, information on age was available for 23 countries, but in different formats. Information on age was not available for Bulgaria, Poland and Spain (8% of all cases).

The largest proportion of cases reported in 2014 was among young adults aged 15–24 years, who accounted for 38% of cases; 25–34-year-olds accounted for 34% of all cases. In countries with comprehensive surveillance systems, age-specific rates of reported cases in 2014 were highest among 20–24-year-olds overall (107 per 100 000 population), but for females the rate among 15–19-year-olds was slightly lower (Figure 3). Rates among males where higher in all age groups 20 years and older. The highest age and gender-specific rates were among males aged 20–24 years (145 per 100 000).

In 2014, 15 countries (accounting for 85% of the reported gonorrhoea cases) reported data on the mode of transmission for 60% or more of their cases (the Czech Republic, Denmark, Finland, France, Latvia, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom). In this group of 15 countries, transmission category was indicated as heterosexual in 49% of all cases; 44% of cases were in men who have sex with men (MSM), and for 7% of cases the transmission group was reported as 'unknown' (Figure 4). Cases diagnosed in MSM represented 65% (n=24 960) of all male cases diagnosed in these countries in 2014. The percentage of cases diagnosed among MSM ranged from 10% or below in Estonia, Latvia, Lithuania, Romania and Slovakia to over 50% in Norway (52%), Malta (61%) and France (61%).

Data on the HIV status of cases were provided by nine countries in 2014 (the Czech Republic, Denmark, France, Malta, the Netherlands, Portugal, Romania, Slovakia and the United Kingdom), representing 81% of all reported gonorrhoea cases. This is a significant increase in completeness over previous years, largely due to the United Kingdom starting to report these data. Of these cases, 5 946 (11%) were HIV positive (either known or newly diagnosed), 62% were HIV negative, and no information on co-infection was available for 27%. Among MSM (23 906 cases), 24% (5 659 cases) were HIV positive, 63% were HIV negative, and no further information was available for 13%.

Figure 3. Rate of reported confirmed gonorrhoea cases per 100 000 population, by age and gender, EU/EEA, 2014

Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, 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=56 695), EU/EEA, 2014

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

Epidemiology: trends 2005–2014

Between 2005 and 2014, 390 138 cases of gonorrhoea were reported in 29 countries, with varying degrees of completeness over time. The number of countries reporting has been relatively stable since 2006, with the exception of Austria, which did not report data in 2014 due to an ongoing revision of the surveillance system, and Italy which did not report data in 2013 and 2014. Croatia has reported data since 2012 following its accession to the European Union.

The overall rate of reported gonorrhoea infection among countries with comprehensive surveillance systems initially decreased from 9 per 100 000 population in 2005 to 8 per 100 000 population in 2008. Since then, however, there has been a marked increase in the overall rate, reaching 20 cases per 100 000 persons in 2014.

The overall rate among countries which reported consistently between 2005 and 2014 (Bulgaria, the Czech Republic, Denmark, Estonia, Finland, Greece, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Norway, Portugal, Romania, Spain, Sweden and the United Kingdom) followed a similar pattern and has increased by 53% since 2008 (Figure 5). Throughout this time period, rates among men were consistently higher than among women. Rates have increased among both genders since 2009, but the increase has been more pronounced among men (+118%) compared with women (+63%).

Age-specific rates increased among all age groups, with the largest increases among over 45-year-olds (2.7-fold since 2008), 35–44-year-olds (2.6-fold) and 25–34-year-olds (2.4-fold). The rate of reported gonorrhoea infection increased between 2008 and 2014 in 15 of 22 countries with comprehensive systems; the number of reported cases has increased among 20 of 26 reporting countries. The largest increases since 2008 were reported from France (4.6-fold) and the Netherlands (4.5-fold).

Between 2009 and 2014, case numbers show an increasing trend among all risk groups, but most markedly among MSM (see Figure 6 on transmission category).

Figure 5. Rate of reported confirmed gonorrhoea cases per 100 000 population, EU/EEA countries reporting consistently, 2005–2014

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

Figure 6. Number of reported confirmed gonorrhoea cases by gender and transmission category, EU/EEA countries reporting consistently, EU/EEA, 2009–2014

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

Discussion

The distribution of gonorrhoea cases (as reported by the Member States) continues to vary considerably across the EU/EEA, with rates ranging from below 1 up to 60 cases per 100 000. The United Kingdom continued to report around 60% of the EU/EEA cases in 2014. Low rates (<5 per 100 000) were generally reported in central and eastern Europe (Bulgaria, Croatia, Poland, Romania, and Slovenia), but also in Cyprus, Greece, Luxembourg and Portugal. Higher rates were reported in the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden), the Baltic states, Ireland, Malta, Spain and the United Kingdom. This geographical pattern has been stable in recent years, although the rates reported have increased in the majority of these countries.

The increasing trend in the number of reported gonorrhoea cases – overall and in many individual countries – indicates ongoing unsafe sexual behaviour that also increases the risk of transmission of other sexually transmitted infections (STIs), including HIV (11% of gonorrhoea cases were co-infected with HIV where data were reported). The increasing trend in gonorrhoea infections continues to be more pronounced in MSM than in heterosexuals. One cause of this increase could be related to increased testing among MSM, particularly at extra-genital sites, a practice recommended by recent guidance [1], and the more widespread use of nucleic acid amplification tests (NAATs) [2].

In 2014, for the first time since ECDC has been collecting data, the number of cases diagnosed among women was higher than the number of cases among heterosexual men. These increases are worrying considering the risk of reproductive tract complications among women and perinatal transmission of gonorrhoea. On the other hand, these increases need to be further evaluated because testing patterns, for example the increased use of dual chlamydia-gonorrhoea NAATs in screening and opportunistic testing programmes, are likely to contribute to the increase. In the context of screening programmes or widespread testing of low-risk populations, dual NAATs should be interpreted with care due to the low positive predictive value in low prevalence populations [3, 4].

The increased rate of gonorrhoea cases reported by the Member States is also worrying due to the threat of antimicrobial-resistant N. gonorrhoeae [5]. The latest resistance data from the European Gonococcal Antimicrobial Surveillance Programme suggest stable levels of resistance to cefixime and no significant increase in resistance to ceftriaxone. Resistance to azithromycin, however, appears to be increasing and the development of resistance to third-generation cephalosporins is feared to be only a matter of time. An ECDC project is currently evaluating changes in circulating gonococcal clones over time, including through the use of whole genome sequencing.

The interpretation of these findings is hampered by incompleteness of reporting. In some countries, the high male-to-female ratio suggests underreporting of MSM as the transmission category of cases (e.g. Lithuania, Portugal and Romania). This is likely due to a lack of identification of homosexually acquired cases or a lack of reporting of such transmission. The European men-who-have-sex-with-men internet survey (EMIS) has reported that a substantial proportion of persons in the east of the region are not 'out' and might therefore not have disclosed their sexuality to healthcare providers [6]. The EMIS survey also identified that the appropriateness of STI screening procedures among MSM varies 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. These differences across countries clearly have an impact on surveillance data and make interpretation of results challenging. ECDC is planning regional workshops with Member States to better understand surveillance data and how they were obtained.

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 diagnoses, for example those made in general practices, are not captured by surveillance systems. In addition, several countries obtain data through sentinel surveillance, which means that the actual number of cases reported to ECDC is only a subset of all diagnosed in the country. Many cases are also either not diagnosed or not reported, again because of differences in availability and diagnostics. Some of the increases reported over time could also be related to improvements in the coverage of surveillance systems. These limitations mean that comparisons between countries should only be undertaken with care.

Public health conclusions

The increasing number of cases reported by many countries in recent years are of concern. Increased high-risk behaviour is likely to explain some of the increase in gonorrhoea notifications, considering the recent rise reported in other STIs, particularly among MSM (e.g. syphilis and HIV). The increasing trend can also be partially attributed to increased use of more sensitive diagnostic tests such as NAAT – and in particular more use of dual Chlamydia trachomatis-Neisseria gonorrhoeae NAAT – across the EU/EEA. Also, testing policies have changed (e.g. testing at multiple anatomical sites among MSM), resulting in improved case ascertainment [7]. Increasing trends among women need to be further evaluated. The increasing number of cases, particularly among MSM, highlight the need to further strengthen prevention activities which target particular groups by using effective, evidence-based messages and methods.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

European Centre for Disease Prevention and Control. Sexually transmitted infections in Europe 2013. Stockholm: ECDC; 2015. Available from: http://ecdc.europa.eu/en/publications/Publications/sexual-transmitted-infections-europe-surveillance-report-2013.pdf

Annex. Surveillance systems overview

Table. Gonorrhoea, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Invasive Haemophilus influenzae disease

Reporting on 2014 data retrieved from TESSy* on 7 July 2016

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Key facts

- In 2014, 2 799 confirmed cases of invasive Haemophilus influenzae (H. influenzae) disease were reported to TESSy.
- The notification rate was 0.6 cases per 100 000 population, a similar rate as in previous years.
- Age-specific rates were highest in infants (4.0 cases per 100 000) and the elderly (1.7 cases per 100 000).
- The H. influenzae type b (Hib) vaccine has led to a progressive and sustained reduction of type b serotype infections. In 2014, 6% of cases with a known serotype were caused by serotype b, 57% of which were aged 25 years and over.
- Non-capsulated strains caused the majority of cases in all age groups and 82% of all cases for which serotyping results were available.
- Serotype f caused 9% of all cases and 72% of cases among non-b capsulated serotypes (serotypes a, c, d, e and f).
- The changing epidemiology of invasive H. influenzae disease should be carefully monitored; disease surveillance should include all age groups, serotypes and clinical presentations.

Methods

Click here for a detailed description of the methods used to produce this annual report

ECDC has coordinated the surveillance of invasive H. influenzae disease at the European level since the transfer of EU-IBIS (European Union Invasive Bacterial Infections Surveillance Network) to ECDC in 2007.

• In 2014, 29 EU/EEA Member States routinely report data on invasive H. influenzae disease to TESSy.

• All Member States report data using the EU case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council) or use a case definition that is compatible with the EU case definition for confirmed cases.

• The majority of Member States report data from comprehensive, passive surveillance systems with national coverage. Belgium, France and Spain report data from sentinel surveillance systems. For a summary of the surveillance systems characteristics in each Member State, please refer to the Annex.

Epidemiology

In 2014, 2 799 confirmed cases of invasive H. influenzae disease were reported by 29 countries (Table 1, Figure 1). No confirmed cases were reported by Malta. Liechtenstein and Luxembourg reported no data (Table 1). In 2014, the overall confirmed case notification rate was 0.6 cases per 100 000 population, comparable to the rates observed from 2010 to 2013, but showing a slightly upward trend. The highest rates were reported by Sweden (2.1 cases per 100 000), Denmark (1.5) and Norway (1.4) (Table 1, Figure 2).

Table 1. Reported, confirmed cases of invasive Haemophilus influenzae disease: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Confirmed cases	Rate	Con-firmed cases	Rate	Con-firmed cases	Rate	Con-firmed cases	Rate	Nation-al data	Report type	Re-ported cases	Con-firmed cases	Rate	ASR
Austria	2	0.0	3	0.0	6	0.1	25	0.3	Y	C	28	28	0.3	0.3
Belgium	70	-	96	-	78	-	67	-	N	C	56	56	-	-
Bulgaria	10	0.1	2	0.0	3	0.0	1	0.0	Y	C	2	2	0.0	0.0
Croatia	.	.	.	.	2	0.0	4	0.1	Y	C	1	1	0.0	0.0
Cyprus	3	0.4	9	1.1	8	0.9	2	0.2	Y	C	1	1	0.1	0.1
Czech Republic	22	0.2	15	0.1	11	0.1	22	0.2	Y	C	19	19	0.2	0.2
Denmark	43	0.8	47	0.8	65	1.2	69	1.2	Y	C	82	82	1.5	1.4
Estonia	1	0.1	2	0.2	3	0.2	2	0.2	Y	C	4	4	0.3	0.3
Finland	41	0.8	66	1.2	81	1.5	48	0.9	Y	C	59	59	1.1	1.0
France	371	0.8	492	1.0	491	1.0	489	1.0	74%	C	453	453	0.9	0.9
Germany	209	0.3	267	0.3	321	0.4	414	0.5	Y	C	461	458	0.6	0.5
Greece	4	0.0	7	0.1	6	0.1	9	0.1	Y	C	6	6	0.1	0.1
Hungary	5	0.0	8	0.1	4	0.0	2	0.0	Y	C	7	7	0.1	0.1
Iceland	0	0.0	2	0.6	0	0.0	0	0.0	Y	C	4	4	1.2	1.2
Ireland	26	0.6	44	1.0	41	0.9	41	0.9	Y	C	61	61	1.3	1.3
Italy	62	0.1	36	0.1	60	0.1	78	0.1	Y	C	101	101	0.2	0.2
Latvia	0	0.0	0	0.0	1	0.0	0	0.0	Y	C	1	1	0.0	0.1
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	1	0.0	2	0.1	3	0.1	2	0.1	Y	C	3	2	0.1	0.1
Luxembourg	0	0.0	0	0.0	.	.	.	.	.	.	.	.	.	.
Malta	2	0.5	0	0.0	5	1.2	0	0.0	Y	C	0	0	0.0	0.0
Netherlands	144	0.9	137	0.8	135	0.8	159	0.9	Y	C	160	160	1.0	0.9
Norway	89	1.8	85	1.7	78	1.6	86	1.7	Y	C	71	71	1.4	1.4
Poland	25	0.1	22	0.1	35	0.1	25	0.1	Y	C	41	41	0.1	0.1
Portugal	10	0.1	23	0.2	45	0.4	28	0.3	Y	C	60	40	0.4	0.4
Romania	19	0.1	10	0.0	9	0.0	5	0.0	Y	C	2	2	0.0	0.0
Slovakia	3	0.1	0	0.0	3	0.1	5	0.1	Y	C	4	4	0.1	0.1
Slovenia	15	0.7	22	1.1	18	0.9	16	0.8	Y	C	15	15	0.7	0.7
Spain	76	0.3	115	0.5	87	0.4	90	0.4	50%	C	130	130	0.6	0.5
Sweden	179	1.9	203	2.2	214	2.3	196	2.1	Y	C	204	204	2.1	1.9
United Kingdom	664	1.1	739	1.2	726	1.1	715	1.1	Y	C	787	787	1.2	1.2
EU/EEA	**2096**	**0.5**	**2454**	**0.5**	**2539**	**0.5**	**2600**	**0.6**		**C**	**2823**	**2799**	**0.6**	**0.6**

Source: Country reports. Legend: Y = yes, N = no, C = case based, A = aggregated, - = no data reported, ASR: age-standardised rate, . = no notification rate calculated

Figure 1. Number of reported, confirmed cases of invasive Haemophilus influenzae disease, EU/EEA, 2014

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

Figure 2. Number of reported, confirmed cases of invasive Haemophilus influenzae disease per 100 000 population, EU/EEA, 2014

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

Age and gender distribution

In 2014, invasive H. influenzae disease was predominantly found in infants and the elderly (Figure 3), with a notification rate of 4.0 confirmed cases per 100 000 population in children under one year of age, and 1.7 confirmed cases per 100 000 population in adults aged 65 years or over. For both age groups, higher rates were observed in males (Figure 3). The overall notification rate was 0.6 cases per 100 000 population for males and 0.6 for females, with a male-to-female ratio of 1.03:1.

Figure 3. Reported, locally acquired Invasive Haemophilus influenzae disease cases, by age and gender, EU/EEA, 2014

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

Seasonality

The distribution of invasive H. influenzae cases by month follows a seasonal pattern, with the highest number of reported cases in the winter months, followed by a steady decrease until August and an increasing trend towards the end of the year. Compared to previous years, a higher peak was seen in May. This peak may be due to random variation as the number of reported cases was small (Figure 4). Figure 5 shows an increasing trend in the number of cases reported from 2010–2014.

Figure 4. Seasonal distribution of reported, confirmed cases of invasive Haemophilus influenzae disease, EU/EEA, 2014 compared with 2010–2013

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

Figure 5: Trend and number of reported cases of invasive Haemophilus influenzae disease, EU/EEA, 2010–2014

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

Serotype

Of the 2 799 reported confirmed cases of invasive H. influenzae disease, 1 706 (61%) – reported by 20 Member States – had a known serotyping result. Of these 1 706 cases, 82% (n=1 394) were non-capsulated (non-typeable). Non-capsulated strains were the most common cause of infection in all age groups (Figure 6). The majority of invasive non-capsulated strains were observed among cases 65 years or over (Figure 7). Serotype b caused 6% (n=104) of cases in 2014. Among cases of serotype b invasive H. influenzae disease, 57% were aged 25 years or over (Figure 7).

Among non-b capsulated serotypes (serotypes a, c, d, e and f), f was the most commonly reported serotype (72%, n=150) and the second most common cause of invasive H. influenzae disease overall (9%). Serotype e contributed to 23% (n=47) of non-b capsulated infections and 3% of all cases. The majority of cases of serotypes e and f infection were in persons aged 45 years and over (Figure 7). Eight cases of serotype a, one case of serotype c, and two cases of serotype d were reported (Figure 6).

Among 17 Member States that consistently reported serotype data from 2010 to 2014, there was a consistent upward trend in non-capsulated strains, with a 61% increase in the number of reported cases between 2010 (n=862) and 2014 (n=1 393). No increasing trends were observed among other serotypes (Figure 8).

Figure 6: Serotype distribution of reported, confirmed cases of invasive H. influenzae disease by age group, EU/EEA, 2014

'Non-caps' refers to non-capsulated strains, 'other' refers to all cases reported as serotype a, c or d.

Source: Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, United Kingdom.

Figure 7: Age group distribution of reported, confirmed cases of invasive H. influenzae disease by serotype, EU/EEA, 2014

'Non-caps' refers to non-capsulated strains, 'other' refers to all cases reported as serotype a, c or d.

Source: Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, United Kingdom.

Figure 8: Trend and number of reported, confirmed cases of invasive H. influenzae disease by serotype, EU/EEA, 2010–2014

'Other' refers to all cases reported as serotype a, c or d.

Source: Country reports from the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, United Kingdom.

Clinical presentation

The clinical presentation was known for 1 519 cases (54% of all cases) reported in 2014. Of these cases, septicaemia was reported in 764 cases (50%), pneumonia in 444 (29%) and meningitis in 161 (11%). Seventeen cases presented with both septicaemia and meningitis. Three cases of epiglottitis, six cases of cellulitis, and eight cases of septic arthritis/osteomyelitis were reported. For 116 cases, the clinical presentation was reported as 'other'. Septicaemia was the most common clinical presentation across age groups and serotypes.

Outcome

The outcome was known for 1 445 cases, 52% of all cases. There were 107 fatal cases reported, a case fatality of 7%, considering only cases with known outcome. Case fatality was highest among cases of serotype e (13%, n=4/31), followed by non-capsulated strains (8%, n=67/823), serotype b (7%, n=3/44) and serotype f (5%, n=5/100). Eighty percent of deaths occurred in persons aged ≥45 years, and 65% in those ≥65 years.

Discussion

In EU/EEA countries, cases of invasive H. influenzae disease are rare with the greatest burden in infants and the elderly, the majority caused by infection with a non-capsulated strain. As in previous years, the disease was most commonly reported in the north of Europe. This observation is possibly due to better case ascertainment and the implementation of enhanced surveillance systems. The results should be interpreted with caution because the completeness of data for some variables, such as clinical presentation and outcome, was low. In addition, there is currently no common definition of fatal outcome due to invasive H. influenzae disease in Europe.

All EU/EEA Member States have made serotype b vaccination part of their routine child immunisation schedule, and the sustained low number of serotype b cases reported highlights the success of this intervention. Indeed, serotype f is now the most common capsulated serotype observed in Europe and accounts for 9% of all cases. Before the introduction of serotype b vaccination, invasive H. influenzae disease was predominantly caused by serotype b infections in healthy young children [1]. The majority of serotype b cases were observed in ≥25 year olds, an expected shift in the age distribution, considering the impact of routine serotype b vaccination [2-5].

In the pre-vaccine era, non-capsulated H. influenzae was not a known common cause of invasive infection, however it is now the leading cause of invasive H. influenzae disease in all age groups, particularly among groups who are more susceptible to infection, e.g. neonates, the elderly, and immunocompromised persons [6-8]. The number of non-capsulated cases reported has steadily increased over the past five years, although many potential explanations exist for this increase, such as increasing survival rates among persons more susceptible to infection, the increased use of immunosuppressive therapy [8], and changes in data reporting or laboratory practices [9].

Several studies have reported increasing trends in non-capsulated H. influenzae as well as in capsulated serotypes a, e and f, following the introduction of routine Hib vaccination [2, 10-13]. There is, however, still no evidence of serotype replacement in the EU following the introduction of routine Hib vaccination [3, 4, 10, 12, 14-16].

Public health conclusions

The sustained success of serotype b vaccination is clear. Maintaining high vaccination coverage across Europe is therefore essential.

The predominance of cases caused by non-capsulated strains shows the importance of continuous monitoring for all strains, for example by genetic typing of non-capsulated strains. All age groups and clinical presentations should be monitored in order to accurately assess changes in the epidemiology and develop preventative interventions.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

ECDC surveillance report on invasive bacterial diseases in Europe 2012: http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=1261

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Network background and EU-IBIS reports: http://www.ecdc.europa.eu/en/activities/surveillance/EU_IBD/background/Pages/Background.aspx

Annex

Table. Invasive Haemophilus influenzae disease, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Hantavirus infection

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Hantavirus infection. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/hantavirus/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- 3 752 cases were reported to TESSy in 2014.
- The notification rate was 0.8 cases per 100 000 population.
- Hantavirus infections are widely distributed across Europe, with the exception of some Mediterranean countries which reported a very low number of cases.

Methods

Click here for a detailed description of the methods used to produce this annual report

• Twenty-seven EU/EEA countries reported cases, while six countries (Cyprus, Ireland, Italy, Lithuania, Malta and Spain) reported zero cases. Data were not available from Denmark, Iceland, Liechtenstein and Portugal.

• Eighteen countries used the EU case definition. An alternative case definition was used by the Czech Republic, France, Germany, Poland and the United Kingdom. Belgium, Cyprus, Finland, Ireland and Italy did not specify their definition or it was unknown.

• Reporting is voluntary in four countries and compulsory in 22 (Cyprus did not supply this information). The surveillance systems are mostly passive, except in Belgium, the Czech Republic, Slovakia and the United Kingdom where active systems are in place. Systems are mostly case-based, except in Belgium, Croatia and Bulgaria (Annex 1).

Epidemiology

In 2014, 3 752 cases were reported, 3 667 of which were confirmed. This was a 74% increase from 2013 when 2 160 cases were recorded, but a 19.9% decrease from 2012 (4 686 recorded cases). Most of the cases (90.4%) were reported from five countries (Croatia, Germany, France, Finland and Sweden), with Finland reporting 55.7% of the cases (Figure 1). In 2013, most of the cases (91%) were reported from three countries (Germany, Finland and Sweden), with Finland reporting 78% of the cases (versus 18.2% of the total cases in 2012).

Over the last years, large variations were noted in the number of reported cases, and since 2008 a peak has been observed every other year (n=4538 in 2008; n=2471 in 2009).

The case notification rate was 0.8 cases per 100 000 population, higher than the rate reported in 2013 (0.4 cases per 100 000 population, but lower than in 2012 (1.1 cases per 100 000 population).

The notification rate in Finland was high during the period 2010–2014, with the highest rate in 2014 (38.32 cases per 100 000 population). Germany had a higher notification rate in 2014 (0.71 cases per 100 000 population) than in 2013 (0.20 cases), but much lower than in 2012 (3.45 cases) when a large outbreak occurred. The notification rate for Sweden increased from 0.51 cases per 100 000 population in 2012 to 4.33 cases in 2014, reaching similar levels to those reported in 2010 and 2011 (Table 1).

Table 1. Reported hantavirus infection cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014				
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	31	0.4	36	0.4	219	2.6	35	0.4	Y	C	74	0.9	0.9	74
Belgium	212	2.0	190	1.7	62	0.6	.	.	Y	A	76	0.7	.	0
Bulgaria	3	0.0	3	0.0	3	0.0	15	0.2	Y	A	9	0.1	0.1	8
Croatia	.	.	.	.	154	3.6	6	0.1	Y	A	209	4.9	5.0	209
Cyprus	.	.	.	.	.	.	0	0.0	Y	C	0	0.0	0.0	0
Czech Republic	8	0.1	9	0.1	9	0.1	12	0.1	Y	C	3	0.0	0.0	3
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	5	0.4	12	0.9	19	1.4	19	1.4	Y	C	26	2.0	2.0	26
Finland	1443	27.0	1834	34.1	841	15.6	1685	31.1	Y	C	2089	38.3	38.3	2089
France	.	.	101	0.2	164	0.3	15	0.0	Y	C	105	0.2	0.2	105
Germany	2016	2.5	305	0.4	2825	3.5	161	0.2	Y	C	571	0.7	0.7	571
Greece	1	0.0	3	0.0	1	0.0	2	0.0	Y	C	2	0.0	0.0	2
Hungary	11	0.1	7	0.1	8	0.1	2	0.0	Y	C	6	0.1	0.1	3
Iceland	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ireland	0	0.0	0	0.0	1	0.0	1	0.0	Y	C	0	0.0	0.0	0
Italy	.	.	.	.	.	.	0	0.0	Y	C	0	0.0	0.0	0
Latvia	4	0.2	4	0.2	12	0.6	8	0.4	Y	C	6	0.3	0.3	6
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Luxembourg	0	0.0	0	0.0	23	4.4	.	.	Y	C	3	0.5	0.5	3
Malta	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Netherlands	0	0.0	0	0.0	0	0.0	1	0.0	Y	C	1	0.0	0.0	0
Norway	21	0.4	39	0.8	13	0.3	19	0.4	Y	C	42	0.8	0.8	42
Poland	6	0.0	8	0.0	3	0.0	8	0.0	Y	C	54	0.1	0.1	50
Portugal	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Romania	4	0.0	4	0.0	3	0.0	4	0.0	Y	C	14	0.1	0.1	14
Slovakia	1	0.0	3	0.1	6	0.1	14	0.3	Y	C	14	0.3	0.2	14
Slovenia	17	0.8	17	0.8	182	8.9	6	0.3	Y	C	25	1.2	1.2	25
Spain	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Sweden	416	4.5	351	3.7	48	0.5	119	1.2	Y	C	418	4.3	4.3	418
United Kingdom	1	0.0	0	0.0	1	0.0	4	0.0	Y	C	5	0.0	0.0	5
EU/EEA	**4200**	**1.2**	**2926**	**0.7**	**4597**	**1.1**	**2136**	**0.4**	**.**	**C**	**3676**	**0.8**	**0.8**	**3667**

Source: Country reports. Legend: Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate

In 2014, Finland reported the highest number of cases (n=2089) of all reporting countries, followed by Germany (n=571) and Sweden (n=418).

Figure 1. Number of reported hantavirus infection cases, EU/EEA, 2014

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

Age and gender distribution

The incidence of hantavirus infection was higher among males (1.0 cases per 100 000 population) than among females (0.6 cases per 100 000 population). The male-to-female ratio was 1.7:1. Hantavirus infections were predominantly reported in adults, with 74.4% of cases in the age groups 25–44 and 45–64 years. A few cases were reported in children (n=60; 1.6% of the cases), with a rate of 0.02 cases per 100 000 in the 0–4-year age group and 0.11 cases per 100 000 population for the 5–14-year-olds.

Figure 2. Reported hantavirus infection cases, by age and gender, EU/EEA, 2014

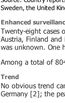
Source: Country reports from Austria, Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Seasonality

For 2014, hantavirus cases were reported all year round, with a peak in January (n=546 cases, mainly from Finland (458 cases); 15% of all cases in 2014 with information about calendar month) and in July and August (n=722 cases; 21% of all cases in 2014 with information about month).

On average, the lowest number of cases in the period 2010–2013 was reported between February and April, followed by a peak in May. In 2014, the lowest number of cases was reported from March to June, followed by a peak in July and August (Figure 3). Remarkably, the highest number of cases in Finland in 2014 was reported in January (468 cases, 22.4%) and in December (13.2%).

Figure 3. Seasonal distribution of reported hantavirus infection cases, EU/EEA, 2014 compared with 2010–2013



Source: Country reports from the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Enhanced surveillance in 2014

Twenty-eight cases of hantavirus infection were identified as travel-related: 19 were reported in Germany; two each in France, Sweden, and the United Kingdom; one each in Austria, Finland and Norway. Out of the 28 travel-related cases, 19 were imported from another EU country. However, for most of the cases (n=2146, 62%) importation status was unknown. One hantavirus pulmonary syndrome case originating from Panama was reported by the United Kingdom [1].

Among a total of 804 documented cases, three fatalities were notified in EU countries in 2014. In 2013, six deaths among 269 documented cases were recorded.

Trend

No obvious trend can be detected in Figure 4. Every other year (2010, 2012 and 2014), a peak can be noticed. The peak in mid-2012 is mainly attributable to an outbreak in Germany [2]; the peak at the end of 2013 and at the beginning of 2014 can be attributed to the outbreak in Finland.

Figure 4: Trend and number of reported hantavirus infection cases, EU/EEA, 2010–2014

Source: Country reports from Austria, Bulgaria, the Czech Republic, Estonia, Finland, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Discussion

Two main hantaviruses cause clinical infections in Europe: Puumala virus, which is transmitted by bank voles and widely distributed in Europe, and Dobrava virus, which is transmitted by stripe field mice and yellow-necked mice and present in the Balkans and central and eastern Europe.

Fluctuations in hantavirus epidemiology appear to be driven by changing landscape attributes and climatic parameters which lead to increased food availability for rodents and prolonged virus survival [3, 4]. There are at present no indicators stating whether there is a real increase in hantavirus cases in Europe.

If variables like temperatures and forest cover levels remain at their current levels, models predict that the incidence of haemorrhagic fever with renal syndrome (e.g. caused by hantavirus such as Puumala and Dobrava) may increase in places where the disease is already present, but will not spread further [3]. However, some extension of the geographic distribution of cases was reported in France in 2014 [5].

Another aetiological agent responsible for haemorrhagic fever with renal syndrome is Seoul hantavirus, which is carried by brown rats (Rattus norvegicus). Only a few human cases of Seoul hantavirus infection have been reported, mostly in Asia and more recently (2012) in France and the UK [6] [7].

Public health conclusions

Avoidance of virus-contaminated dust during work or leisure time is essential. Airborne dust should be avoided when areas containing rodent droppings are cleaned, and moist cleaning with disinfectants is recommended. For people with underlying disease, face masks should be used.

Wild rodents taken into homes as pets or to laboratories for research purposes have caused infections.

Since Puumala virus remains infective outside the host for an unusually long period (up to two weeks at room temperature), the risk of infection can persist even after the rodents have been removed.

Suggestions to prevent hantavirus and improve the communication strategy include [8]:

1. A common case definition at the European level

2. Sharing information on prevention and communication strategies among countries

3. Assessing the impact of prevention to support evidence-based preventive measures

4. A better understanding of the risk factors, risk groups, and the effectiveness of preventive measures through multidisciplinary collaboration among experts

5. Assessing the impact of communication strategies on relevant target groups with regard to disease awareness, knowledge, and preventive measures to improve communication.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annex

Table 2. Hantavirus infection, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Hepatitis B

Reporting on data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Hepatitis B. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/hepatitis-b/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 30 EU/EEA Member States reported 22 442 cases of hepatitis B virus (HBV) infection, a crude rate of 4.2 cases per 100 000 population.
- Of these cases, 11.9% were reported as acute, 64.0% as chronic, 22.4% as 'unknown', and 1.7% could not be classified.
- The most affected age group for both acute and chronic infections was the group of 25–34-year-olds accounting for 33.8% of cases; the overall male-to-female ratio was 1.5 to 1.
- There has been a steady decline in the reported rate of acute cases since 2006, which is most likely related to the impact of national vaccination programmes. Rates of chronic cases have risen over time, and this increase is probably due to changes in reporting methods as well as increases in local testing practices.
- Data on transmission were complete for only 10.4% of cases. Among acute cases with complete information, heterosexual transmission was most commonly reported (29.9%), followed by nosocomial transmission (17.9%), non-occupational transmission (12.0%), transmission among men who have sex with men (11.8%) and transmission through injecting drug use (9.3%). Mother-to-child transmission was the most commonly reported route (59.5%) for those categorised as chronic cases.
- The ongoing transmission of cases and diversity in the reported routes of transmission across Europe, highlights the need for countries to continue to improve the quality of surveillance data and to maintain prevention and control practices.

Methods

Click here for a detailed description of the methods used to produce this annual report

This report includes data on newly diagnosed cases of hepatitis B reported to ECDC by EU/EEA countries. Countries were requested to follow the EU 2012 case definition for reporting at the European level, but other case definitions were also accepted (Annex).

Acute and chronic hepatitis B infections were differentiated by countries using defined criteria (Table 1).

Table 1. Criteria for differentiating acute and chronic hepatitis B

Stage	Definition
Acute	Detection of IgM antigen-specific antibody (anti-HBc IgM) or Detection of hepatitis surface antigen (HBsAg) and previous negative HBV markers less than six months ago or Detection of hepatitis B nucleic acid (HBV-DNA) and previous negative HBV markers less than six months ago Any of the above with or without symptoms and signs (e.g. jaundice, elevated serum aminotransferase levels, fatigue, abdominal pain, loss of appetite, intermittent nausea, vomiting, fever)
Chronic	Detection of HBsAg or HBeAg or HBV-DNA and No detection of anti-HBc IgM (negative result) or Detection of HBsAg or HBeAg or HBV-DNA on two occasions that are six months apart*
Unknown	Any newly diagnosed case which cannot be classified in accordance with the above definition of acute or chronic infection

* In the event that the case was not notified the first time.

Surveillance systems across the EU/EEA countries are heterogeneous (Annex: table 2). Eighteen countries submitted national data in 2014 based on the 2012 EU case definition. Five countries used the 2008 EU case definition and seven countries (Belgium, Denmark, Latvia, Luxembourg, Portugal and Romania) used national case definitions. The 2008 EU case definition only allows for the reporting of acute hepatitis B cases whereas the 2012 case definition includes both acute and chronic cases. All reported cases were included in the analysis, regardless of which case definition was used. The data collected according to the EU 2012 case definition represent confirmed cases; however, a few countries submitted 'probable' cases using alternative case definitions.

Annual notification rates were calculated per 100 000 population for countries with comprehensive surveillance systems using Eurostat population data (http://epp.eurostat.ec.europa.eu). For data reported from the UK, population data from the Office for National Statistics were used to exclude Scotland which did not report any hepatitis B data.

In nine countries – Cyprus, the Czech Republic, Denmark, Germany, Iceland, Italy, Malta, Portugal, Spain – historical data from the year 2006 were not included as they would not have been comparable with the subsequent enhanced data.

Hepatitis B data are presented by 'date of diagnosis' and, if not available, by 'date used for statistics'. When comparing data defined according to the two different dates across the database, there were only minor differences between them, and only in a few countries.

Italy reports data using two data sources. One of these sources has national coverage, but includes only a limited number of variables and was used for the calculation of national rates and for the breakdown by age and gender. The other data source in Italy is a sentinel system covering an estimated 76% of the population and includes epidemiological data on a range of variables. The sentinel population is considered representative of the wider population, and the data provided were scaled up from 76% to 100%. This source was used for epidemiological analyses including the route of transmission and importation status.

The data source for Belgium is a sentinel system with unknown coverage. National rates were therefore not calculated for Belgium.

Epidemiology: overall trends

In 2014, 30 EU/EEA Member States reported 22 442 cases of hepatitis B virus (HBV) infection (no data from Liechtenstein), a crude rate of 4.2 per 100 000 population. Of these cases, 2 667 (11.9%) were reported as acute, 14 371 (64.0%) as chronic, 5 020 (22.4%) as 'unknown', and 384 cases (1.7%) could not be classified due to an incompatible data format.

In 2014, 24 countries were able to provide data on acute cases (Table 2). The rate of acute cases ranged from 0 cases in Malta to 3.2 per 100 000 in Bulgaria (Figure 1). This includes countries that defined data by disease status or used a case definition that includes only acute cases (e.g. EU 2008).

Table 2. Number and rate of reported hepatitis B cases per 100 000 population, EU/EEA, 2010–2014†

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Country	2010		2011		2012		2013		2014							
	All		All		All		All		All		Acute*		Chronic*		Unknown*	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	733	8.8	756	9	832	9.9	670	7.9	1165	13.7	74	0.9	582	6.8	509	6
Belgium									1627						1627	
Bulgaria	387	5.2	344	4.7	322	4.4	302	4.1	235	3.2						
Croatia					136	3.2	136	3.2	149	3.5						
Cyprus	7	0.9	10	1.2	14	1.6	9	1	4	0.5					4	0.5
Czech Republic	244	2.3	191	1.8	154	1.5	133	1.3	105	1					105	1
Denmark	170	3.1	264	4.7	298	5.3	283	5.1	231	4.1	17	0.3	211	3.7	3	0.1
Estonia	58	4.4	44	3.3	51	3.8	36	2.7	33	2.5	8	0.6	25	1.9		
Finland	278	5.2	247	4.6	249	4.6	268	4.9	276	5.1	19	0.3	257	4.7		
France	91	0.1	102	0.2	100	0.2	83	0.1	93	0.1	93	0.1				
Germany	763	0.9	810	1	686	0.8	684	0.8	740	0.9	578	0.7			162	0.2
Greece	35	0.3	38	0.3	50	0.5	32	0.3	27	0.2	27	0.2				
Hungary	60	0.6	67	0.7	53	0.5	62	0.6	65	0.7	65	0.7				
Iceland	29	9.1	25	7.9	20	6.3	16	5	28	8.6	3	0.9			25	7.7
Ireland	649	14.3	523	11.4	571	12.5	429	9.3	422	9.2	28	0.6	383	8.3	11	0.2
Italy	709	1.2	679	1.1	561	0.9	505	0.8	140	0.2					140	0.2
Latvia	322	15.2	318	15.3	329	16.1	303	15	262	13.1	62	3.1	200	10		
Lithuania	71	2.3	60	2	23	0.8	35	1.2	26	0.9	26	0.9				
Luxembourg	18	3.6	16	3.1	26	5	38	7.1	32	5.8	1	0.2	11	2	20	3.6
Malta	20	4.8	35	8.4	18	4.3	17	4	22	5.2	0	0	21	4.9	1	0.2
Netherlands	1794	10.8	1735	10.4	1525	9.1	1305	7.8	1215	7.2	141	0.8	1065	6.3	9	0.1
Norway	764	15.7	763	15.5	706	14.2	738	14.6	695	13.6	22	0.4	673	13.2		
Poland	128	0.3	104	0.3	78	0.2	1541	4	68	0.2	68	0.2				
Portugal	16	0.2	26	0.2	28	0.3	24	0.2	48	0.5	19	0.2			29	0.3
Romania	486	2.4	412	2	361	1.8	302	1.5	266	1.3	247	1.2	19	0.1		
Slovakia	209	3.9	171	3.2	159	2.9	194	3.6	182	3.4	81	1.5	101	1.9		
Slovenia	42	2.1	71	3.5	41	2	52	2.5	39	1.9	12	0.6	27	1.3		
Spain	662	1.4	522	1.1	525	1.1	645	1.4	633	1.4	633	1.4				
Sweden	1589	17	1389	14.8	1606	16.9	1673	17.5	1909	19.8	106	1.1	1667	17.3	136	1.4
United Kingdom**	6036	10.5	7876	13.6	8761	15	9149	15.6	11705	19.8	337	0.6	9129	15.4	2239	3.8
Total EU/EEA	16370	3.4	17598	3.6	18283	3.7	19664	4.0	22442	4.2	2667	0.6	14371	9.8	5020	1.3

† Data presented by date of diagnosis.
* Includes the cases reported by countries as acute, chronic or unknown using the differentiation criteria
** Excludes data from Scotland

Figure 1. Rate of reported acute hepatitis B cases* per 100 000 population, EU/EEA, 2014

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

* Countries were included if they were able to present data by disease status or they used a case definition that included only acute cases (e.g. EU 2008).
** Underreporting of acute hepatitis B in France was estimated at 76.5% in 2013.
*** UK data exclude Scotland

In 2014, 15 countries submitted data on chronic infections, ranging from 0.1 cases per 100 000 in Romania to 17.3 in Sweden (Table 2). The United Kingdom reported 63.5% of all chronic cases reported in 2014.

In 2014, the overall reporting rate for acute cases of hepatitis B (0.6 per 100 000) was considerably lower than the rate for chronic cases diagnosed and has shown a steady decline since 2006 (1.3 per 100 000) (Figure 2). No country showed an increase in their rate of acute cases over the reporting period, and 9 of the 16 countries that reported consistently over this time period reported a steady decline in the reported number of acute cases. The rate of reported chronic infections increased steadily over time: from 5.7 per 100 000 in 2006 to 9.8 in 2014.

Figure 2. Rate of acute and chronic hepatitis B cases per 100 000 population, EU/EEA, 2006–2014

Note: Logarithmic scale

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

* Underreporting of acute hepatitis B in France was estimated at 76.5% in 2013.
** UK data exclude Scotland

Epidemiology: age and gender

In 2014, 12 284 cases of hepatitis B were reported in males (5.1 per 100 000) and 8 334 cases were in females (3.3 per 100 000). This represents a male-to-female ratio of 1.5 to 1. The male-to-female ratio was higher among acute cases (2.2 to 1) than among chronic cases (1.4 to 1). One third of all cases (33.8%) were in the 25–34-year age group. The age distributions among reported cases of acute and chronic infections were similar (Figure 3), and the proportion of both acute and chronic cases aged under 25 has declined over time from 26.8% of acute cases and 21.4% of chronic cases in 2006, to 13.5% and 11.9%, respectively.

Figure 3. Rate of reported acute hepatitis B cases per 100 000 population, by age group, EU/EEA, 2014

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

* Underreporting of acute hepatitis B in France was estimated at 76.5% in 2013.
** UK data exclude Scotland

The age distribution among male and female acute cases was similar, although for all age categories above 25 years of age the rates were higher among males than females (Figure 4).

Figure 4. Rate of reported acute hepatitis B cases per 100 000 population, by age group and gender, EU/EEA, 2014

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

* Underreporting of acute hepatitis B in France was estimated at 76.5% in 2013.
** UK data exclude Scotland

Epidemiology: route of transmission

In 2014, data on transmission were complete for only 2 340 (10.4%) of the reported hepatitis B cases. For the 836 acute cases with complete information, heterosexual transmission was most commonly reported (29.9%), followed by nosocomial transmission (17.9%), transmission through non-occupational injuries (12.0%), transmission among men who have sex with men (11.8%) and transmission through injecting drug use (9.3%) (Figure 5). Italy, Poland, and Romania accounted for 73.5% of the acute cases attributed to nosocomial transmission. Mother-to-child transmission was the most common route of transmission reported for the 1 466 chronic cases with complete information (59.5%), followed by transmission through 'other' routes (15.5%), heterosexual transmission (7.6%) and transmission through injecting drug use (4.2%). Among chronic cases attributed to mother-to-child transmission, 93.1% were reported by three countries (Denmark, the Netherlands, and Sweden). Of the chronic cases attributed to mother-to-child transmission, 89.4% were classified as imported. Transmission category over time showed no obvious trends among either acute or chronic cases.

Figure 5. Transmission category of hepatitis B cases by acute and chronic disease status, EU/EEA, 2014*

Source: Country reports from Austria, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden, and the United Kingdom**.

* Among cases where transmission status is known
** UK data exclude Scotland

Epidemiology: importation status

In 2014, of 6 518 cases (29.0%) with information on importation status, 3 879 (59.5%) were reported by 20 countries as imported. The majority of these cases (92.3%) were chronic, and 3 091 (76.7%) were reported by three countries (the Netherlands, Norway and Sweden). The proportion of chronic cases (79.4%) reported as imported was higher than the proportion of acute cases (10.6%). Data completeness varies across countries, but among countries with complete data on importation status, the proportion of cases classified as imported ranged from 0% (Estonia, Hungary and Romania) to 100% (Sweden).

Epidemiology: outcome

Data on the outcome of infection was reported for 4 929 (21.9%) of cases in 2014. Of these cases, 35 (0.7%) were reported to have died from causes related to hepatitis B. This proportion has remained stable since 2006.

Discussion

High numbers of newly diagnosed hepatitis B infections are reported from across Europe, with the majority of these infections classified as chronic. Across countries, the distribution of both acute and chronic cases varies considerably. This geographical variation reflects both the differences in local testing and reporting practices as well as underlying epidemiological differences. There are no striking geographical trends in reported cases of acute hepatitis B, but the three countries with the highest reported rates (Bulgaria, Latvia and Slovakia) are located in the eastern parts of Europe where prevalence is known to be highest [1]. The geographical trends for reported chronic hepatitis B cases are also not clear as data for many countries are missing. However, the highest rates are found in the north European countries, which is contrary to what may be expected based on the results from seroprevalence surveys. However, it is possible that many of these surveys may underestimate the true prevalence as these studies may not include migrant groups among whom prevalence may be high [2]. This discrepancy highlights the difficulty in interpreting routine surveillance data for chronic infections which are mostly asymptomatic until late stages of the disease. Indeed, the data are more reflective of local testing policies, with higher rates among countries such as the United Kingdom and the Netherlands which are known to have low prevalence but comprehensive testing programmes [3, 4]. Although data are missing from several northern European countries, they dominate the reporting of chronic hepatitis B cases across Europe, accounting for a substantial proportion of the cases, and as a result have a strong influence on the trends.

Several countries made changes to their surveillance systems, which makes a clear interpretation of the trends over time more difficult. There was an increase in the number of countries reporting data in recent years but each year the number of countries reporting data has varied. The overall trend for acute cases declined over time up to 2012, and this decline is most likely related to the impact of national vaccination programmes [5]. The stabilising overall rate of acute cases observed in 2013 and 2014, which may be related to additional countries reporting in recent years, conceals a continued decline in acute cases in many of the reporting countries. The overall number and rate of chronic cases has continued to rise over time, and this increase is most likely related to changes in reporting methods as well as increased efficiency in local testing practices among key populations such as migrants and prisoners [6, 7].

The influence of migration on reported cases of hepatitis B in Europe is strong for many countries, especially for chronic infections. While data on importation status are incomplete, with no information for 12 countries in 2014 (including the United Kingdom), data from most of the north-western European countries with complete reporting indicate that a high proportion of newly diagnosed chronic infections are considered to have been acquired in a different country. In recent decades, migrants to many countries in north and western Europe have come from countries with high prevalence of hepatitis B, and prevalence among some of these migrant groups is often high [2]. Migration is reported to have had an impact on the epidemiology of hepatitis B in some northern and north-western European countries, and this highlights the importance of monitoring routine surveillance indicators of migration, such as importation status [7].

In terms of transmission, while data completeness was better for acute cases than chronic cases, the overall incompleteness of the reported data impairs the interpretation of the differences between countries, and it is likely that the data from across Europe are not fully representative. The most common routes of transmission reported among acute cases include heterosexual transmission, nosocomial transmission, non-occupational injury, transmission among men who have sex with men and transmission through injecting drug use. Although nosocomial transmission is an uncommon route of transmission for acute cases in most European countries, it remains a key route of transmission in some, such as Italy, Poland and Romania, highlighting the importance of maintaining robust infection control practices across healthcare settings. Mother-to-child transmission is the most common route of transmission among reported chronic cases but is dominated by the large number of cases reported by three north European countries, with most of these cases classified as being imported. The validity of the reported route of transmission among imported cases is not known and could form a subject for future study. Unfortunately, changes over time in the completeness of reporting of transmission data impede comparisons over the period.

Public health conclusions

Robust epidemiological information is essential to inform effective prevention and control priorities and to assess the impact of implemented strategies. A clear interpretation of hepatitis B data collected through routine surveillance remains challenging due to the asymptomatic nature of chronic infections, differences in testing programmes, continued differences in surveillance practices between countries and data quality issues. Despite such challenges, the high numbers of reported cases (especially of chronically infected

persons) and diversity in reported routes of transmission across Europe suggest that countries should continue to maintain and strengthen local prevention and control programmes to interrupt transmission and prevent further infections. Indeed, with evidence of ongoing transmission and the importation of cases to many countries, there is a clear need for countries to improve the quality of surveillance data, especially data on the country of birth and whether cases are considered to be imported, to improve the data utility. Further work is also needed to assist countries in adopting the current EU case definition to increase the standardisation of the data across countries. ECDC will continue to support Member States in this area and will develop alternative epidemiological methods to complement routine surveillance, such as seroprevalence and sentinel surveys.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

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Annex

Table. Hepatitis B, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Hepatitis C

Reporting on data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Hepatitis B. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/hepatitis-b/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 35 321 cases of hepatitis C were reported from 28 EU/EEA Member States, a crude rate of 8.8 cases per 100 000 population.
- Of the cases reported, 1.3% were classified as acute, 13.3% as chronic, 74.7% as 'unknown' and 10.7% were not classified.
- Hepatitis C is more commonly reported among men than women, with a male-to-female ratio of 1.8 to 1. Just over half (51.3%) of all hepatitis C cases reported in 2014 were aged between 25 and 44 years, and 8.0% of cases were under 25 years of age.
- Only 15.8% of the cases included data on the mode of transmission and of these the most commonly reported was injecting drug use, which accounted for 78.1% of those cases with complete information on transmission status.
- Between 2006 and 2014, the overall number of cases diagnosed and reported across all EU/EEA Member States increased by 28.7%, with most of this increase observed since 2010.
- The interpretation of hepatitis C data across countries is hampered by differences in surveillance systems, testing practices and programmes, and difficulties in defining the cases as acute or chronic. The surveillance of hepatitis C, a disease which is largely asymptomatic until a late stage, is challenging, with reported notifications reflecting testing practices rather than true occurrence of disease.

Methods

Click here for a detailed description of the methods used to produce this annual report

This report includes data on newly diagnosed cases of hepatitis C virus (HCV) infection reported to ECDC by EU/EEA countries. Countries were requested to follow the EU 2012 case definition for reporting at the European level*, but other case definitions were also accepted.

* 2012/506/EC: Commission Implementing Decision of 8 August 2012 amending Decision 2002/253/EC laying down case definitions for reporting communicable diseases to the Community network under Decision No 2119/98/EC of the European Parliament and of the Council.

Acute and chronic hepatitis C infections were differentiated by countries using defined criteria (Table 1).

Table 1. Criteria for differentiating acute and chronic hepatitis C

Stage	Definition
Acute	Recent HCV seroconversion (prior negative test for hepatitis C in last 12 months) or Detection of hepatitis C virus nucleic acid (HCV RNA) or hepatitis C virus core antigen (HCV-core) in serum/plasma and no detection of hepatitis C virus antibody (nega tive result)
Chronic	Detection of hepatitis C virus nucleic acid (HCV RNA) or hepatitis C core antigen (HCV-core) in serum/plasma in two samples taken at least 12 months apart*
Unknown	Any newly diagnosed case which cannot be classified in accordance with the above definition of acute or chronic infection

* In the event that the case was not notified the first time.

Surveillance systems across the EU/EEA countries are heterogeneous (Annex). Fourteen countries submitted data in 2014 based on the current EU case definition (two countries less than in 2013). Seven countries used the previous 2008 EU case definition (Belgium, Denmark, Germany, Italy, Luxembourg, Portugal and Romania) used national case definitions. The EU 2012 case definition is fairly similar to the EU 2008 case definition, but includes detection of hepatitis C core antigen as an additional diagnostic criterion. Both case definitions capture all acute and chronic laboratory-diagnosed cases of hepatitis C. All reported cases were included in the analysis, regardless of which case definition was used. The data collected represent confirmed cases; however, a few countries submitted 'probable' cases using alternative case definitions.

Several countries made changes to their surveillance systems during the last few years and, for a few countries, historical data were not included as they would not have been comparable with the subsequent enhanced data. Hepatitis C data are presented by date of diagnosis, or, if not available, by 'date used for statistics'. When comparing data defined according to the two different dates across the database, there were only minor differences between them, and only in a few countries.

Italy reports data using two data sources. One of these sources has national coverage, but includes only a limited number of variables and was used for the calculation of national rates and analysis by age and gender. The other data source is a sentinel system covering an estimated 76% of the population and includes epidemiological data on a range of variables. The sentinel population is considered representative of the wider population, and the data provided were scaled up from 76% to 100%. This source was used for epidemiological analyses including the route of transmission and importation status.

The data source for Belgium is a sentinel system with unknown population coverage. National rates were therefore not calculated for Belgium.

Epidemiology: overall trends

In 2014, 28 EU/EEA Member States reported 35 321 cases (crude rate of 8.8 per 100 000 population) of HCV infection (no data from France, Liechtenstein and Spain), an increase of 15.4% over the previous year. Between 2006 and 2014, the number of cases has increased by 28.7% from 27 442 cases in 2006, with the rate across all countries fluctuating between 7.3 and 9.4 per 100 000 population but showing a steady increase since 2010 (Figure 1). Of 35 321 cases, 458 (1.3%) were reported as acute, 4 698 (13.3%) as chronic, 26 380 cases (74.7%) were reported as 'unknown', and 3 785 cases (10.7%) could not be classified due to an incompatible data format.

Country-specific rates ranged from 0.1 cases per 100 000 in Italy to 74.5 cases per 100 000 in Latvia. The United Kingdom accounted for 39.7% of all reported cases.

Table 2. Number and rate of reported hepatitis C cases per 100 000 population, EU/EEA, 2010–2014†

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Country	2010		2011		2012		2013		2014							
	All		All		All		All		All		Acute*		Chronic*		Unknown*	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	880	10.5	1122	13.4	1075	12.8	993	11.7	1954	23	93	1.1	913	10.7	948	11.1
Belgium									1151						1151	
Bulgaria	58	0.8	60	0.8	92	1.3	95	1.3	90	1.2						
Croatia					171	4	202	4.7	144	3.4						
Cyprus	26	3.2	57	6.8	48	5.6	36	4.2	30	3.5					30	3.5
Czech Republic	709	6.8	812	7.7	796	7.6	929	8.8	808	7.7					808	7.7
Denmark	318	5.7	295	5.3	263	4.7	265	4.7	181	3.2	6	0.1	173	3.1	2	0
Estonia	276	20.7	210	15.8	245	18.5	273	20.7	315	23.9	20	1.5	295	22.4		
Finland	1138	21.3	1135	21.1	1165	21.6	1172	21.6	1224	22.5					1224	22.5
France																
Germany	5281	6.5	5075	6.2	4978	6.1	5168	6.3	5737	7.1					5737	7.1
Greece	11	0.1	18	0.2	43	0.4	22	0.2	18	0.2	2	<0.1	16	0.1		
Hungary	11	0.1	43	0.4	38	0.4	46	0.5	43	0.4	43	0.4				
Iceland	59	18.6	72	22.6	51	16	72	22.4	38	11.7					38	11.7
Ireland	1240	27.3	1254	27.4	1026	22.4	778	16.9	694	15.1	21	0.5	68	1.5	605	13.1
Italy	236	0.4	234	0.4	221	0.4	205	0.3	45	0.1					45	0.1
Latvia	1156	54.5	1324	63.8	1352	66.1	1327	65.6	1491	74.5	57	2.8	1434	71.6		
Lithuania	41	1.3	43	1.4	40	1.3	59	2	34	1.2	34	1.2				
Luxembourg	73	14.5	74	14.5	53	10.1	68	12.7	68	12.4			68	12.4		
Malta	14	3.4	18	4.3	24	5.7	14	3.3	14	3.3	1	0.2	13	3.1		
Netherlands	31	0.2	68	0.4	57	0.3	65	0.4	52	0.3	52	0.3				
Norway	1783	36.7	1675	34	1513	30.3	1318	26.1	1213	23.7					1213	23.7
Poland	2179	5.7	2241	5.9	2265	6	2641	6.9	3551	9.3						
Portugal	39	0.4	45	0.4	42	0.4	21	0.2	63	0.6	7	0.1			56	0.5
Romania	76	0.4	80	0.4	126	0.6	127	0.6	104	0.5	84	0.4	20	0.1		
Slovakia	237	4.4	304	5.6	230	4.3	314	5.8	381	7	35	0.6	346	6.4		
Slovenia	87	4.3	95	4.6	102	5	89	4.3	64	3.1	3	0.1	61	3		
Spain																
Sweden	1939	20.8	2153	22.9	1990	21	2005	21	1786	18.5					1786	18.5
United Kingdom	9951	15.9	12138	19.3	13474	21.2	13757	21.5	14028	21.8			1291	2	12737	19.8
Total EU/EEA	27849	7.3	30645	8	31480	8.1	32061	8.3	35321	8.8	458	0.5	4698	3.7	26380	9.5

† Data presented by date of diagnosis.
* Includes the cases reported by countries as acute, chronic or unknown using the differentiation criteria.

Figure 1. Rate of reported hepatitis C cases per 100 000 population, EU/EEA, 2006–2014

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

In 2014, 14 countries were able to provide data on acute cases (Table 2). The rate of reported acute cases ranged from <0.1 cases per 100 000 in Greece to 2.8 in Latvia. Twelve countries submitted data on chronic infections, ranging from 0.1 cases per 100 000 in Greece and Romania to 71.6 in Latvia. Figure 2 shows the overall notification rate of hepatitis C cases in EU/EEA countries in 2014. Countries were included if their surveillance system was known by ECDC to capture data on both acute and chronic cases, even if most cases were classified as 'unknown'. Notification rates were higher in central and north European countries than in south-eastern European countries.

Figure 2. Rate of reported hepatitis C cases per 100 000 population, EU/EEA, 2014

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

Epidemiology: age and gender

In 2014, 21 926 cases were reported in males (11.6 per 100 000) and 12 063 cases were in females (6.1 per 100 000). This represents a male-to-female rate of 1.8 to 1. Approximately half (51.3%) of all cases were in the 25–44-year age group. The age distributions were similar among males and females (Figure 3), and the most affected age group was those between 25 and 34 years of age (24.2 cases per 100 000 in males, 12.0 cases per 100 000 in females). There was a difference in the age distributions of acute and chronic cases, with 21.5% of acute cases and 6.5% of chronic cases under 25 years of age.

Figure 3. Rate of reported hepatitis C cases per 100 000 population, by age and gender, EU/EEA, 2014

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

Epidemiology: route of transmission

Data regarding the most likely route of transmission of hepatitis C were complete for only 5 591 (15.8%) cases in 2014. Of these cases with complete information, the most commonly reported route of transmission across all disease categories was injecting drug use, which accounted for 78.1%. The percentage of injecting drug use among cases with a known transmission route was lower among acute cases (33.9%) than among those classified as chronic (72.6%) (Figure 4) or 'unknown' (83.4%). Among those categorised as acute cases, other key routes of transmission included nosocomial transmission (27.6%), transmission among men who have sex with men (11.2%) and heterosexual transmission (8.5%). All the cases attributed to nosocomial transmission were reported by four countries (Italy, Latvia, Romania and Slovakia). Between 2013 and 2014, there was a 40.1% decline in the number of acute cases attributed to transmission among men who have sex with men; however, the number of acute cases with complete information on transmission was very low.

Figure 4. Transmission category of hepatitis C cases by acute and chronic disease status, EU/EEA, 2014

Source: Country reports from Austria, Denmark, Estonia, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Romania, Slovakia, Slovenia, and the United Kingdom.

Epidemiology: importation status

In 2014, 17 countries provided data for 11 941 cases (33.8%) on whether a case was considered to have been 'imported' from outside the reporting country or acquired in the country itself. Of those cases only 1 310 (11.0%) were reported as being imported.

Discussion

The number of newly diagnosed hepatitis C cases reported from countries across Europe remains at a high level and there is considerable variation in the number and rates of cases between the countries. This is consistent with evidence from sero-prevalence surveys indicating a substantial burden across Europe with 5.4 million persons estimated to be chronically infected with hepatitis C in the EU/EEA and 0.4% to 5.6% of the population having HCV antibodies [1, 2]. Recent WHO estimates suggest that there are 84 000 deaths each year from HCV-related liver cancer and cirrhosis in the WHO European Region [3]. Deaths from viral hepatitis now exceed those from tuberculosis and HIV.

Although the number of reporting countries has increased in recent years, data analysis and interpretation remain challenging on account of the incompleteness of data and heterogeneity in national surveillance practices. The number of countries using the EU case definition has fallen, which reduces the comparability of data across countries. Countries still have difficulty defining cases as acute or chronic and the majority of cases reported are classified 'unknown'. It is likely that most of these 'unknown' cases are chronic infections as acute hepatitis C is difficult to diagnose. The variation in reported cases between countries is likely to be related to differences in local testing practices because hepatitis C is mostly asymptomatic, so most newly diagnosed cases are probably identified through local screening initiatives. Indeed, many northern European countries, which have extensive testing programmes targeting populations at risk, report the highest notification rates in the EU/EEA, but are also known from serosurveys to have low-prevalence estimates [1, 4]. By comparison, the countries in the east and south-east of Europe have the lowest reported rates of cases, but the highest prevalence estimates. This discrepancy highlights the challenge of interpreting hepatitis C surveillance data and the importance of considering the data alongside other sources of information such as local testing practices and seroprevalence estimates.

The data indicate that hepatitis C is an infection which predominantly affects young men. This is consistent with the demographic profile of injecting drug use, the main route of transmission across all disease categories and most countries, and emphasises the ongoing need for comprehensive harm reduction measures targeted at this population at risk. Among acute cases, other reported routes of transmission included nosocomial transmission, transmission among men who have sex with men, and heterosexual transmission. Reports of a rise in hepatitis C infections among HIV-positive men who have sex with men in several European countries dating back to 2000 resulted in many countries scaling up targeted prevention and control responses [5].The recent decline in the number of reported cases attributed to transmission among men who have sex with men may reflect the impact of this response, although the incompleteness of the reported data hamper any firm conclusions that may be drawn. Nosocomial transmission remains an uncommon route of transmission in most European countries, but is still a key route of transmission among newly diagnosed cases in a few countries, highlighting the importance of comprehensive infection control systems within healthcare.

Public health conclusions

Hepatitis C is an important public health issue across Europe, with a high burden of infection and associated morbidity and mortality. With rapidly evolving developments in the therapeutic field, it is essential that countries have access to robust epidemiological information to plan effective prevention and control programmes. The surveillance data do not provide a clear epidemiological picture and should be carefully examined alongside information on local screening practices and available seroprevalence data. Further improvements to the quality of hepatitis C surveillance data are important to increase data utility, and ECDC is working closely with Member States to improve local surveillance systems. ECDC is also currently reviewing which alternative epidemiological methods may be required to support Member States in their efforts to tackle the public health challenges posed by this infection. Despite the limitations of routine surveillance for hepatitis C, the data clearly indicate that a high proportion of the reported cases are attributed to injecting drug use, highlighting the importance of targeted harm reduction measures. Ongoing nosocomial transmission and transmission among men who have sex with men in the region indicate that Member States should have targeted and comprehensive public health programmes tailored to the local epidemiology.

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Annex

Table. Hepatitis C, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

HIV/AIDS

Reporting on 2014 data retrieved from TESSy* on 5 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – HIV/AIDS. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/aids/surveillance-reports/Pages/Annual-Epidemiological-Report-2016.aspx

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Key facts

- HIV infection remains a major public health concern in EU/EEA countries, with 30 000 to 33 000 new infections reported each year. In contrast, the overall number of AIDS cases has continued to steadily decline with increasing use of effective antiretroviral treatment.
- In 2014, 29 958 people were diagnosed with HIV in the 31 countries of the EU/EEA, a rate of 5.9 per 100 000 population. This figure underestimates the true rate due to the delay in reporting HIV diagnoses and under-reporting in a number of countries.
- The majority (77%) of people diagnosed with HIV in 2014 were men and the highest proportion of all new diagnoses (42%) were attributed to sex between men. Heterosexual contact accounted for 33% of cases and injecting drug use for 4%.
- When adjusted for reporting delay, the overall rate of HIV diagnoses per 100 000 population has remained fairly stable between 20 05 and 2014. However, there is an increase in the proportion of new diagnoses attributed to sex between men, while all other risk gr oup transmission modes have decreased.

Methods

Click here for a detailed description of the methods used to produce this annual report

- In 2014, all 31 countries of the EU/EEA reported case-based HIV data in accordance with standard EU/EEA case definitions, while 30 countries reported case-based AIDS data.
- All HIV and AIDS data are from case-based surveillance.
- To correct for reporting delay, a statistical approach using historical data from 2005 to 2014 was applied [1]. Countries were excluded from reporting delay adjustment when they: i) showed an inconsistent and non-stationary pattern in their reporting delay distribution during the period 2005–2014, or ii) reported aggregated data during the period 2005–2014. Reporting delays were taken into account for the calculation of graphs on transmission mode and disease trends.

Epidemiology

In 2014, 29 958 new HIV diagnoses were reported in 31 EU/EEA countries, with a rate of 5.9 per 100 000 population (Table 1). This rate rises to 6.4 per 100 000 when adjusted for the reporting delay. The highest rates were reported by Estonia (22.1; 291 cases), Latvia (17.3; 347 cases), and Luxembourg (12.6; 69 cases). The lowest rates were reported by Slovakia (1.6; 86 cases), Croatia (2.2; 92 cases), and the Czech Republic (2.2; 232 cases) (Table 1, Figure 1).

The rate for men in the EU/EEA was 9.2 per 100 000 population and for women, 2.6 per 100 000 population. The male-to-female rate ratio was 3.5:1.

Men had higher age-specific rates than women in all age groups, except in persons under 15 years, where age-specific rates were similar (Figure 2). The highest rate of new HIV diagnoses per 100 000 population was in the age group 25–29 years (14.6) with the rate in men in this age group at 22.7 per 100 000 population, and the rate in women peaked at 6.8 per 100 000 population in the age group 30–39 years.

Table 1. New HIV diagnoses by country, EU/EEA, 2010–2014

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	2010		2011		2012		2013		2014	
Country*	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	332	4	328	3.9	326	3.9	266	3.1	235	2.8
Belgium	1198	11.1	1183	10.8	1229	11.1	1125	10.1	1039	9.3
Bulgaria	163	2.2	201	2.7	157	2.1	200	2.7	213	2.9
Croatia	70	1.6	77	1.8	74	1.7	85	2	92	2.2
Cyprus	41	5	54	6.4	58	6.7	54	6.2	56	6.5
Czech Republic	180	1.7	153	1.5	212	2	235	2.2	232	2.2
Denmark	275	5	266	4.8	201	3.6	233	4.2	256	4.5
Estonia	376	28.2	366	27.5	315	23.8	325	24.6	291	22.1
Finland	184	3.4	172	3.2	156	2.9	157	2.9	181	3.3
France	5539	8.6	5416	8.3	5668	8.7	5525	8.4	4327	6.6
Germany	2714	3.3	2699	3.3	2978	3.6	3288	4	3525	4.4
Greece	639	5.7	953	8.6	1142	10.3	864	7.9	714	6.5
Hungary	182	1.8	162	1.6	219	2.2	240	2.4	271	2.7
Iceland	24	7.6	23	7.2	19	5.9	11	3.4	11	3.4
Ireland	330	7.3	328	7.2	349	7.6	343	7.5	359	7.8
Italy	4027	6.8	3889	6.6	4144	7	3811	6.4	3695	6.1
Latvia	274	12.9	299	14.4	339	16.6	340	16.8	347	17.3
Liechtenstein	4	11.1	1	2.8	0	0	0	0	1	2.7
Lithuania	153	4.9	166	5.4	160	5.3	177	6	141	4.8
Luxembourg	53	10.6	56	10.9	58	11.1	61	11.4	69	12.6
Malta	18	4.3	21	5.1	30	7.2	36	8.5	40	9.4
Netherlands	1206	7.3	1151	6.9	1062	6.3	1014	6	831	4.9
Norway	258	5.3	269	5.5	242	4.9	233	4.6	268	5.2
Poland	957	2.5	1120	2.9	1098	2.9	1103	2.9	1061	2.8
Portugal	1937	18.3	1685	15.9	1607	15.2	1464	14	920	8.8
Romania	553	2.7	784	3.9	870	4.3	898	4.5	791	4
Slovakia	28	0.5	49	0.9	50	0.9	83	1.5	86	1.6
Slovenia	35	1.7	55	2.7	45	2.2	44	2.1	49	2.4
Spain	3748	11.4	3493	10.6	3732	9.9	3866	8.3	3366	7.2
Sweden	457	4.9	391	4.2	381	4	354	3.7	350	3.6
United Kingdom	6348	10.2	6181	9.8	6247	9.8	6024	9.4	6141	9.5
Total EU-EEA	**32303**	**6.5**	**31991**	**6.5**	**33168**	**6.6**	**32459**	**6.3**	**29958**	**5.9**

* HIV diagnosis data from Bulgaria were revised during the production of this report, following the publication of previously validated data in the enhanced 2014 HIV/AIDS surveillance report. For this reason, Bulgaria's number of reported cases and the EU/EEA overall number of reported cases for 2014 differ slightly from earlier publications (213 versus 247 diagnoses in Bulgaria in 2014).

Figure 1. New HIV diagnoses per 100 000 population, EU/EEA, 2014

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

Figure 2. HIV/AIDS male-to-female ratio in 27 EU/EEA countries, 2014

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

Data on transmission mode provide information on the groups that are most affected by HIV in the EU/EEA; this information was available for 24 084 HIV diagnoses (80.3%):

- In 2014, sex between men remains the predominant mode of HIV transmission reported in the EU/EEA, accounting for 42% of diagnoses overall, and 53% of HIV diagnoses where the route of transmission was known.
- Sex between men and women is the second most commonly reported mode of transmission in the EU/EEA, accounting for 33% of diagnoses overall, and 41% of HIV diagnoses where the route of transmission was known.
- Four percent of HIV diagnoses overall, and 5% of HIV diagnoses with known route of HIV transmission, were attributed to injecting drug use.
- One percent of diagnoses were reported as mother-to-child transmission; 41% of those cases originated from countries with generalised HIV epidemics. Seventy-one cases (0.2%) were reported to be due to transfusion of blood and its products, and 22 (0.1%) were hospital-acquired infections. The majority of these cases were born outside of the EU/EEA and/or are thought to have been acquired outside of the country in which the case was reported.

In 2014, 29 EU/EEA countries provided information on the country of birth, country of nationality or region of origin for 25 445 (85%) HIV diagnoses. Overall, 9 579 of the 25 445 diagnoses with known region of origin (37%) were made among people originating from outside of the reporting country; 4 139 of these 9 579 diagnoses (16% of total diagnoses with known region of origin) were in people originating from countries with generalised HIV epidemics, while the remaining 5 440 diagnoses (21% of total diagnoses with known region of origin) were in people originating from outside the reporting country, but from countries without a generalised epidemic.

Information on CD4 cell count at the time of HIV diagnosis was provided by 23 countries for 18 411 HIV diagnoses (61%) in adults and adolescents. Nearly half (47%) of these cases were diagnosed with a count of less than 350 cells per mm^3, including 27% of cases with advanced HIV infection (CD4 <200 cells/mm^3).

Trends in HIV diagnoses

The notification rate of 5.9 per 100 000 population in 2014 was slightly below the relatively stable trend observed during the period 2005–2013 when rates fluctuated between 6.3 and 6.9. The notification rate in 2014, however, is likely to be an underestimate due to reporting delay. When adjusted for this delay, it rises to 6.4 per 100 000 population.

Since 2005, 27 EU/EEA countries have consistently reported data on transmission mode. Over the same period, the coverage of disease surveillance systems in these countries was of a comparable standard. Data indicate the following (Figure 3):

- The number of HIV diagnoses reported among MSM increased steadily between 2005 and 2014. The proportion of all HIV diagnoses attributed to sex between men increased from 30% of cases in 2005 to 42% of cases in 2014. Between 2005 and 2014, increases were observed in all but six EU/EEA countries.
- The number of heterosexually acquired cases decreased in both men and women between 2005 and 2014. The proportion of HIV diagnoses attributed to heterosexual transmission decreased from 48% of cases in 2005 to 33% in 2014.
- The number of HIV diagnoses reported among people who inject drugs has been declining since 2005, when infections attributed to injecting drug use comprised 6.4% of new diagnoses. A temporary increase in overall numbers for the EU/EEA was observed in 2011 and 2012 due to localised outbreaks in Greece and Romania, but reported cases in 2014 show a continued downward trend and comprise 4% of all new diagnoses.
- HIV transmitted from mother to child continues to be a rare event and decreased from 288 in 2005 to 215 in 2014.
- The number of cases reported to have an unknown mode of transmission has increased from 13% of new diagnoses in 2005 to 19% in 2014.
- Reporting delays differ significantly between transmission categories for some countries. When standardised adjustments for reporting delay are made, these increase the number of reported HIV cases in all transmission categories by between 8% and 19%, depending on the category. Figure 3 shows the adjusted trends.

Figure 3. New HIV diagnoses, by transmission mode and year of diagnosis, adjusted for reporting delay, EU/EEA, 2005–2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

AIDS diagnoses

Diagnoses of AIDS continued its steady decline. In 2014, 4 020 diagnoses of AIDS were reported by 30 EU/EEA countries (all EU/EEA countries except Sweden), resulting in a rate of 0.8 cases per 100 000 population. The highest rates were reported by Latvia (8.5, 171 cases) and Portugal (2.4, 249 cases). In 2014, the rate of reported AIDS cases has more than halved from the 2.0 per 100 000 (9 203 cases) reported in 2005.

Threats description for 2014

No HIV or AIDS threats were reported in 2014.

Discussion

Despite the stable trend of HIV in the EU/EEA, data provide evidence of important changes in the epidemiology of HIV during the past decade. There has been a sustained increase in HIV diagnoses among MSM in all but six EU/EEA countries. MSM account for the largest number of new HIV diagnoses and are the only population in the EU/EEA where HIV cases continue to increase. While some of these increases could be due to decreased stigmatisation resulting in reducing underreporting of sex between men as a transmission mode over time, the data in many countries indicate a pressing need to significantly scale-up more effective multi-component prevention programmes for this at-risk population [2].

There has been a substantial decrease in the number of HIV infections transmitted through sex between men and women during the past decade. However, heterosexual transmission still remains the second most common mode of HIV transmission in the EU/EEA and is the most common transmission mode in some countries. Part of the decline in heterosexual cases is the result of a decline in the number of heterosexually acquired cases in persons originating from countries with generalised HIV epidemics. Further investigation is required in order to understand whether these decreasing trends in HIV diagnoses are mainly driven by decreasing incidence of HIV in these populations, decreased testing, migration trends, or a combination of factors.

In 2014, migrants (or persons originating from outside of the reporting country) constituted a considerable proportion (37%) of new HIV diagnoses in the EU/EEA. There is evidence that a proportion of migrants, even those originating from HIV-endemic areas, acquire HIV after arrival in the EU/EEA [3-5], indicating the need for targeted interventions directed at this vulnerable population.

Transmission among people who inject drugs is declining and remains at a low level in most countries in the EU/EEA. However, sudden increases were observed in recent years in Romania and Greece, countries with previously very low levels of HIV among people who inject drugs [6, 7]. This illustrates the importance of maintaining adequate coverage of harm reduction services and that patterns can change quickly in this at-risk group in the absence of effective prevention [8].

Although few in number, cases infected through mother-to-child transmission continue to occur in some EU/EEA countries. Greater efforts are needed to address these entirely preventable cases through adequate antenatal screening and prevention of mother-to-child transmission.

Despite the clear evidence of the benefits of early introduction of antiretroviral treatment for the health of the HIV-positive individual [9, 10], many persons continue to be diagnosed with HIV at an advanced stage of illness. This suggests problems with access to, and uptake of, HIV testing and counselling by those most at risk in many countries.

Public health conclusions

The changes in the epidemiology of HIV infections observed in the EU/EEA over the last decade indicate that some progress has been achieved, particularly with regard to reduced infections attributed to heterosexual transmission and injecting drug use. However, these epidemiological trends also indicate that it is crucial to sustain evidence-based HIV prevention interventions that are tailored to the local epidemiological context and targeted at those most at risk.

For most EU/EEA countries, this means a strong focus on reducing the vulnerability of MSM. Migrants, both those from high-endemic countries and other countries, are also a key population that needs specific prevention and control efforts in the majority of EU/EEA countries. Given the increasing evidence of post-migration HIV acquisition, it is important that migrant-sensitive services for prevention and HIV testing, combined with policies which promote and ensure access and linkage to care are delivered in all EU/EEA countries.

Finally, harm reduction programmes among people who inject drugs and their sexual partners are crucial and should be maintained and scaled up where service coverage is low. To decrease the number of people who are diagnosed late, new strategies are required for the delivery of expanded targeted HIV testing services [11, 12]. These services should be tailored to the specific needs of these groups and support timely linkage to HIV prevention, treatment and care. This will ensure earlier diagnoses and treatment initiation and, in turn, improve treatment outcomes and reduce morbidity, mortality and HIV incidence.

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Annex

Table. HIV, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Seasonal influenza

Reporting on 2014 data retrieved from TESSy[*] on 10 September 2015

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Key facts

- Influenza activity started in week 50/2014 and lasted until week 20/2015, as in the previous season.
- Compared with the previous season, nine EU/EEA countries reported higher peak ILI rates in primary care.
- In almost all countries, the season was dominated by influenza A(H3N2) viruses.
- Influenza B virus circulation increased following the decline of influenza A virus circulation.
- Antigenic and genetic drift of influenza A(H3N2) virus concurred with low vaccine effectiveness.
- A very low number of the influenza A viruses showed evidence of reduced susceptibility to neuraminidase inhibitors.
- Almost 50% of all ICU cases were 65 years or older, mainly infected by A(H3N2); during the previous season, which was dominated by A(H1N1)pdm09, this age group represented one third of all ICU cases.
- Among 14 European countries reporting to EuroMOMO, significant excess winter mortality from all causes – concomitant with influenza activity – was observed among persons aged 65 years and above.
- Overall, the 2014–2015 influenza season was severe compared to previous years.

Methods

Click here for a detailed description of the methods used to produce this annual report.

The surveillance of influenza in EU/EEA countries is carried out by the European Influenza Surveillance Network (EISN) and coordinated by the European Centre for Disease Prevention and Control (ECDC).

Influenza surveillance is based on weekly data reported by sentinel general practitioners (in some countries other physicians, e.g. paediatricians, also report data) and national influenza reference laboratories. The reporting season lasts from week 40 to week 20 the following year. Data are sent to The European Surveillance System (TESSy) database at ECDC.

Surveillance data include:

1. The aggregate number of influenza-like illness (ILI) and/or acute respiratory infection (ARI) cases seen by sentinel physicians[*] (Annex). Each country also reports denominator data (population covered by sentinel surveillance) to enable calculation of weekly ILI and ARI consultation rates.

2. Three qualitative indicators of influenza activity: intensity, geographic spread and trend. Intensity, ranging from low to very high, is an indicator of the level of influenza activity. Geographic spread, ranging from no activity to widespread, refers to the number of affected areas in a given country. Trend, increasing, stable or decreasing, compares the level of ILI/ARI sentinel consultations with the previous week.

3. The aggregate number of sentinel specimens obtained from a systematic sample of ILI/ARI patients and testing positive for influenza, type A subtype and B lineage (Annex). Overall positivity rates of sentinel specimens are used to estimate the influenza activity [1, 2], and an arbitrary 10% cut-off point is considered to indicate the seasonal epidemic.

4. Aggregate antigenic and genetic characterisation and disaggregate antiviral susceptibility data for a subset of influenza viruses detected both in sentinel and non-sentinel specimens (Annex).

5. Case-based hospital data are reported by a subset of countries on a voluntary basis: Finland, France, Ireland, Romania, Slovakia, Spain, Sweden, and the UK (Annex).

Since the 2014–2015 season, influenza surveillance is jointly coordinated by ECDC and the WHO Regional Office for Europe. The population under surveillance includes the 53 countries of the WHO European Region and results are disseminated through a joint bulletin (www.FluNewsEurope.org). For the purpose of this report, data from 30 EU/EEA countries are presented. Archived weekly data of the 2014–2015 season are available at http://www.flunewseurope.org/Archives. This report also uses data from the EuroMOMO project, which monitors weekly mortality data in Europe.

Epidemiology

Sentinel surveillance

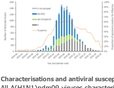
The proportion of sentinel specimens testing positive for influenza virus crossed the 10% threshold in week 50/2014, reached its highest level between week 5/2015 and 8/2015 – with a maximum of 61% in week 7/2015 – and returned to baseline level in week 20/2015 (Figure 1). In week 7/2015, ten countries reported high or very high influenza intensity, the highest number of countries for the season.

Compared to the previous season, peak ILI rates were higher in Austria, Cyprus, the Czech Republic, Greece, Hungary, Iceland, Latvia, the Netherlands and Spain.

Young patients (0–4 and 5–14 years) were the most affected in the majority of countries which reported ILI/ARI by age group. However, in the UK, particularly in Scotland and Wales, ILI rates of young adults and the elderly (15–64 and ≥ 65 years) were higher than in children and adolescents.

During the reporting period, 28 177 sentinel specimens were tested, and 12 798 (45%) were positive for influenza. Of the positive specimens, 8 950 (70%) were type A and 3 848 (30%) were type B. Of 8 351 A viruses subtyped, 6 529 (78%) were A(H3N2) and 1 822 (22%) were A(H1N1)pdm09 virus. Of 1 215 influenza B viruses ascribed to lineage, 1 191 (98%) were B(Yamagata) and 24 (2%) were B(Victoria). A(H3N2) virus dominated the season until past its peak. The circulation of B virus increased from early 2015 onward. From week 11/2015, influenza B virus became dominant in most countries.

Figure 1. Weekly proportion of sentinel specimens positive for influenza virus and number of detections by type and subtype, EU/EEA, 2014–2015



Characterisations and antiviral susceptibility

All A(H1N1)pdm09 viruses characterised antigenically and genetically were similar to the components of the influenza vaccine recommended for the 2014–2015 season [3].

Of the 1 017 influenza A(H3N2) viruses antigenically characterised, 743 (73%) were dissimilar to the vaccine virus (A/Texas/50/2012). In addition, 53 A(H3N2) viruses were not attributable to any category. Of 1 225 A(H3N2) viruses genetically characterised, 823 (67%) fell in genetic groups with antigenic properties dissimilar to the vaccine virus.

The main circulating lineage of B viruses was Yamagata. Of the 461 influenza B(Yamagata) lineage viruses genetically characterised and attributed to a clade, 99% were dissimilar to the vaccine virus (B/Massachusetts/2/2012) and close to B/Phuket/3073/2013 virus. Also, one B(Yamagata) lineage virus was not attributed to a clade. Similarly, 83% of the 874 B(Yamagata) lineage viruses attributed to a category were antigenically dissimilar to the vaccine strain, and 37 B(Yamagata) lineage viruses were not attributed to a category.

Phenotypic and genotypic testing for neuraminidase inhibitors was conducted on 2 956 and 2 932 circulating viruses for oseltamivir and zanamivir respectively. Ten viruses, five A(H3N2) and five A(H1N1), showed evidence of reduced susceptibility to oseltamivir or zanamivir.

Hospitalisations due to influenza

Eight countries reported a total of 5 835 laboratory-confirmed hospitalised influenza cases during the 2014–2015 influenza season, with France, Spain and the UK accounting for 4 484 (76%) of all cases (Table 1). The level of care was known for 2 710 patients (from a total of four countries), of whom 23% were admitted to an intensive care unit.

Table 1. Number of hospitalised laboratory-confirmed influenza cases by season, country, and level of care; eight EU countries, 2014–2015

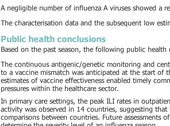
Download Excel version

Country	2014–2015			
	General care	ICU	Unknown	Total
Finland		33		33
France		1 549		1 549
Ireland	922	43		965
Romania	107	45		152
Slovakia	17	7	1	25
Spain	1 048	521	154	1 723
Sweden		176		176
UK		1 212		1 212
Total	**2 094**	**3 586**	**155**	**5 835**

In 2014–2015, 80% of influenza cases reported from 8 countries were infected with influenza type A and 20% with type B. Of influenza A viruses subtyped, 35% were influenza A(H1N1)pdm09 and 65% were A(H3N2). In 2013–2014, A(H1N1)pdm09 virus predominated among ICU cases with known subtype, while type B was virtually absent.

Of all ICU cases, 49% were 65 years or older in 2014–2015, while in 2013–2014 this age group accounted for 32% (Figure 2).

Figure 2. Number of cases admitted to selected intensive care units by (sub-)types and age groups; Finland, France, Ireland, Romania, Slovakia, Spain, Sweden and the United Kingdom, 2013–2014 and 2014–2015



All-cause excess mortality

In 15 European countries that report mortality data to the EuroMOMO project, an excess winter mortality rate of 231.3 per 100 000 above the seasonal baseline was observed. This excess was noted for more than 11 consecutive weeks and was the highest of the last five winter seasons. The observed excess coincided with influenza activity as determined by the weekly proportion of influenza-positive sentinel specimens reported to ECDC [4, 5]. This excess roughly corresponds to 217 000 deaths among the 94 million elderly citizens (65 years of age or older) of the 28 EU Member States.

Discussion

The start and duration of the influenza season was similar to previous seasons (week 50/2014 to week 20/2015), but higher sentinel ILI consultation rates were observed in nine EU countries compared with the previous season.

Influenza A(H3N2) viruses predominated in almost all reporting countries, followed by an increasing dominance of B viruses when the circulation of A(H3N2) viruses declined. Both virus types were detected in severe hospitalised influenza cases, as opposed to the previous season which was dominated by A(H1N1)pdm09 (one third of ICU cases). Almost half of all ICU cases in the 2014–2015 season were 65 years of age or older.

In addition to a significant increase in ICU admissions, a particularly high excess all-cause excess mortality in the elderly, concomitant with influenza activity, was reported to EuroMOMO. Therefore, overall, the 2014–2015 season was severe compared with the mild 2013–2014 season.

Due to the mismatch between vaccine and circulating strains, estimates of vaccine effectiveness – especially against A(H3N2) and B(Yamagata) viruses – were low [6, 7].

A negligible number of influenza A viruses showed a reduced susceptibility to neuraminidase inhibitors.

The characterisation data and the subsequent low estimates of vaccine effectiveness caused WHO to change the recommended composition of the 2015–2016 vaccine [8].

Public health conclusions

Based on the past season, the following public health conclusions can be drawn:

The continuous antigenic/genetic monitoring and central reporting of viruses confirmed the drift of A(H3N2) viruses away from the vaccine virus. A low vaccine effectiveness due to a vaccine mismatch was anticipated at the start of the season and was rapidly confirmed by mid-season results published in peer-reviewed journals [6, 7, 9, 10]. Such early estimates of vaccine effectiveness enabled timely communication of the importance of antiviral treatment and prophylaxis in particular target groups, and preparedness for pressures within the healthcare sector.

In primary care settings, the peak ILI rates in outpatients were higher in nine countries than in previous seasons. An excess mortality from all causes associated with influenza activity was observed in 14 countries, suggesting that the season had been severe. However, this assessment is hampered by the fact that the data are not well suited for comparisons between countries. Future assessments of severity would benefit from further harmonisation of reporting. Also in need of harmonisation are the criteria used to determine the severity level of an influenza season.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Seasonal influenza: latest surveillance data

Previous reports

Season 2013–2014
http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=1134

Season 2012–2013
http://ecdc.europa.eu/en/publications/Publications/Respiratory-tract-infections-annual-epidemiological-report-2014.pdf

Season 2011–2012
http://ecdc.europa.eu/en/publications/Publications/annual-epidemiological-report-2013.pdf

Season 2010–2011
http://ecdc.europa.eu/en/publications/Publications/Annual-Epidemiological-Report-2012.pdf

Season 2009–2010
http://ecdc.europa.eu/en/publications/Publications/1111_SUR_Annual_Epidemiological_Report_on_Communicable_Diseases_in_Europe.pdf

Season 2008–2009
http://ecdc.europa.eu/en/publications/Publications/1011_SUR_Annual_Epidemiological_Report_on_Communicable_Diseases_in_Europe.pdf

Season 2007–2008
http://ecdc.europa.eu/en/publications/Publications/0910_SUR_Annual_Epidemiological_Report_on_Communicable_Diseases_in_Europe.pdf

Season 2006–2007
http://ecdc.europa.eu/en/publications/Publications/0812_SUR_Annual_Epidemiological_Report_2008.pdf

Season 2005–2006
http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=2940

Season 2004–2005
http://ecdc.europa.eu/en/publications/Publications/0706_SUR_Annual_Epidemiological_Report_2007.pdf

Risk assessment – Seasonal influenza in the EU/EEA countries, 2014–2015, Jan 2015
http://ecdc.europa.eu/en/publications/Publications/seasonal-influenza-risk-assessment.pdf

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ECDC. Seasonal influenza vaccination in Europe – 2015
http://ecdc.europa.eu/en/publications/Publications/Seasonal-influenza-vaccination-Europe-2012-13.pdf

Annex. Surveillance systems overview

Table: Surveillance systems overview, 2014–2015

Download Excel version (clinical and virological data, laboratory-confirmed hospitalised influenza cases, antiviral resistance)

[*] The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

[†] ILI and a denominator were reported by Austria, Belgium, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, and the UK. ARI and a denominator were reported by Belgium, Bulgaria, Cyprus, the Czech Republic, Estonia, Germany, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Romania, Slovak Republic, Slovenia, and the UK.

Zoonotic influenza

Reporting on 2014 data retrieved from TESSy*

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Zoonotic influenza. [Internet]. 2016 [cited YYYY MMM DD]. Available from: http://ecdc.europa.eu/en/healthtopics/avian_influenza/Pages/Annual-Epidemiological-Report.aspx

Key facts

- Large human outbreaks of avian influenza A(H5N1) and A(H7N9) were reported from China and Egypt.
- Sporadic human cases of avian influenza A(H5N6), A(H9N2) and A(H10N8) were reported world-wide.
- No human cases of avian influenza were reported in the EU/EEA.
- In 2014, an increasing number of outbreaks and detections in poultry and wild birds of highly pathogenic avian influenza viruses such as A(H5N2), A(H5N3) or A(H5N8) were reported worldwide.
- Influenza viruses A(H1N1)v, A(H1N2)v and A(H3N2)v of swine origin caused six human infections in the United States and Sweden.

Methods

Click here for a detailed description of the methods used to produce this annual report.

Epidemiology

Avian and swine influenza in humans

Two human cases of zoonotic influenza were reported in the EU/EEA in 2014.

Avian influenza virus A(H5N1)

In 2014, the number of outbreaks and detections of highly pathogenic avian influenza virus A(H5N1) in poultry and wild birds rose compared with the years before, resulting in an increase of human cases, particularly in Egypt (see OIE and FAO) [1]. In 2014, Cambodia, China, Egypt, Indonesia and Vietnam reported 52 human cases of A(H5N1), including 22 deaths. Most cases (37 cases, including 14 deaths) occurred in Egypt at the end of 2014 [1], and ECDC published a rapid risk assessment. Similar to previous years, transmission to humans was associated with close contact to infected poultry. In January 2014, Canada reported a fatal imported case of influenza A(H5N1) infection, with symptom onset in late December 2013. This was the first confirmed human case of A(H5N1) in North America (see epidemiological update). Between 2003 and 2014, WHO reported 695 human cases due to A(H5N1), including 403 deaths (see here) worldwide.

Avian influenza virus A(H5N6)

In 2014, China reported two human cases infected with avian influenza virus A(H5N6). One was reported in April in Sichuan province, the other was reported in December in a 58-year-old man from Guangdong. The likely source of infection was exposure to infected poultry (see WHO).

Avian influenza virus A(H7N9)

Since the identification of a novel reassortant low pathogenic avian influenza A(H7N9) virus in March 2013 in China, a wave of human infections has been observed in China each winter season. Domestic human cases of A(H7N9) have been reported from China, Hong Kong and Taiwan, and Malaysia reported travel-related cases. In 2014, 334 laboratory-confirmed cases of human infection with avian influenza A(H7N9) virus **were reported.** The main source of infection was exposure to infected poultry or contaminated environments. No sustained human-to-human transmission was recorded, although small clusters of human cases was identified. ECDC published two rapid risk assessments on 28 January 2014 and 26 February 2014 and an epidemiological update on 7 February 2014.

Avian influenza virus A(H9N2)

Two human cases with mild illness due to avian influenza A(H9N2) were detected in China in late 2014 [1]. Given the widespread circulation of the strain in poultry in the country, it is likely that these cases were related to contact with infected poultry.

Avian influenza virus A(H10N8)

In 2014, two human cases of avian influenza A(H10N8) virus following contact to poultry were reported in Jiangxi province in China: a 55-year-old woman in January and a 75-year-old man in February (WHO).

Swine influenza virus A(H1N1)v

The United States reported one human case infected with a variant swine-origin influenza A(H1N1)v virus. The infected person reported exposure to swine before onset of symptoms [1-3].

Swine influenza virus A(H1N2)v

A reassortant influenza A(H1N2)v virus with internal genes closely related to the A(H1N1)pdm09 virus and a neuraminidase derived from a human influenza A(H3N2) virus was detected in two farmers and swine on a farm in Västra Götaland region, Sweden, during the winter 2013–2014. Both human cases were asymptomatic, and no further human infections were detected among other farmers or family members (WHO).

Swine influenza virus A(H3N2)v

In the United States, three human cases infected with influenza A(H3N2)v viruses from swine were reported in 2014 from two different states (CDC, WHO) [1].

Avian influenza detections in birds and seals

Worldwide, highly pathogenic avian influenza A(H5N1) recurred in 2014 in many countries and affected poultry and wild birds. Outbreaks were reported from Cambodia, China, Egypt, India, Libya, North Korea, Nepal, Russia, and Vietnam.

New avian influenza H5 viruses with reassortment of genes between Asian and North American strains [e.g. A(H5N1), A(H5N2) and A(H5N3)] were discovered in the United States and Canada in 2014. The introduction of these viruses into poultry holdings caused large outbreaks in different countries. Detections of highly pathogenic avian influenza virus A(H5N2) were reported from Canada, China, Taiwan and the United States. A(H5N3) was detected in China and Taiwan.

Highly pathogenic avian influenza virus A(H5N6) was found in Burkina Faso, China (including Hong Kong), Laos and Vietnam.

In 2014, highly pathogenic avian influenza A(H5N8) outbreaks were reported in poultry in Germany, Italy, the Netherlands and the United Kingdom. Some of these countries also reported detections in wild birds [4]. One indoor farm in Italy and one in the United Kingdom were affected. In Germany and the Netherlands, detections were reported from several indoor farms as well as wild birds. In 2014, Canada, China, Japan, South Korea, Taiwan, Russia and the United States also reported A(H5N8) detections in wild birds or poultry. A(H5N8) was detected in chickens, different duck species, hens, turkeys, falcons and guinea fowl. No transmission to humans was reported. ECDC published two rapid risk assessments on this topic (13 November 2014 and 20 November 2014) and two epidemiological updates (13 November 2014 and 21 November 2014).

Mexico reported the only highly pathogenic H7 virus, with A(H7N3) outbreaks in poultry in 2014 (see OIE).

A new influenza virus A(H10N7) caused an epidemic in 2014, with mass mortality in seals moving from the western coast of Sweden to the eastern coast of Denmark, then to the western coast of Denmark and subsequently via the German coastline to the Netherlands [5-7]. The closest ancestor of this virus was found in wild birds, pointing to an avian-mammal transmission event.

Discussion

No human cases of avian influenza were detected in EU countries despite several outbreaks of highly pathogenic avian influenza virus in poultry holdings. However, increased numbers of human cases of avian influenza A(H5N1), A(H5N6), A(H7N9), A(H9N2) and A(H10N8) were reported outside of Europe, particularly in Egypt and China, a result of an increase in infected poultry and human exposure in those countries. The established surveillance system for human cases of avian influenza in affected countries during the last decade confirms the continuing threat of avian influenza to human health. So far, no sustained human-to-human transmission has been observed, indicating that the transmission of avian influenza to humans is a rare event and viruses have not acquired the capability to transmit between humans.

Large outbreaks in poultry in the United States and Canada and the continuous circulation of various H5 and H7 viruses in poultry and wild birds in other parts of the world are a reminder that avian influenza represents a constant threat. Transmission to mammals has not been reported for avian influenza viruses A(H5N2) and A(H5N8) despite having caused large zoonotic outbreaks in the US and Europe.

In 2014, influenza viruses of swine origin were reported to have caused human infections in Sweden and the United States.

Public health conclusions

Avian-to-human and swine-to-human transmission of influenza viruses was well documented in 2014. Influenza viruses of animal origin remain a concern for human health in Europe, given their continuing genetic evolution, the risk of reassortment with influenza viruses that are more transmissible among humans, and given the close human contact with potentially infected birds or pigs. Therefore, reassortment between swine and human viruses needs to be carefully monitored.

The emergence of new avian influenza viruses with the potential to infect humans and cause severe disease underlines the importance of surveillance in both humans and animals. Early detection of transmission to humans is essential for preventing further cases. Serological studies – particularly of highly exposed poultry farmers and workers, as part of the investigation in bird outbreaks – help to assess the risk for humans when new avian influenza viruses emerge. In order to be better prepared for a new pandemic arising from any of these new strains, WHO has published a list of candidate vaccines that are currently under development (see WHO). In the absence of a vaccine, rigorous disease control among swine and poultry as well as personal protection of people exposed to infected animals remain the most effective preventive measure.

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Additional information

Previous reports
http://ecdc.europa.eu/en/publications/Publications/Respiratory-tract-infections-annual-epidemiological-report-2014.pdf

Peer reviewed article by ECDC epidemiologists: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20996

Rapid Risk Assessment on H5N1 Egypt, Dec 2014:
http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List={4F55AD51-4AED-4D32-B960-AF70113DB890}&ID=1236

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Lassa fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Lassa fever. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/lassa_fever/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, no cases of Lassa fever or other arenaviruses responsible for viral haemorrhagic fevers were reported in the EU/EEA.

Methods

Click here for a detailed description of the methods used to produce this annual report

- Data were obtained from 23 EU/EEA countries.
- The EU case definition was used by 15 countries, three countries used an alternative case definition, and five countries did not specify the case definition they used.
- Surveillance is compulsory in 20 EU/EEA countries, comprehensive in 21 countries, and mostly passive (active surveillance only in the Czech Republic, Slovakia and the United Kingdom) (Annex). Data reporting is case based and done at the national level.

Epidemiology

No cases of Lassa fever were reported in EU and EEA countries in 2014.

Discussion

Lassa fever is an acute viral illness that occurs in West Africa, mainly in Nigeria, Sierra Leone, Liberia and Guinea. A few cases were also reported in Cote d'Ivoire, Ghana and Benin. The viral aetiology of the disease was identified in 1969. The name refers to the town of Lassa, Nigeria, where the disease was first described. The reservoir of Lassa virus is a rodent known as the multimammate rat (Mastomys natalensis). Several other rodent-borne arenaviruses infecting humans (e.g. Junin, Machupo, Guanarito) circulate in South America [1].

Humans become infected through contact with the excreta of infected rodents. While about 80% of the infected people are asymptomatic, the remaining patients develop severe multi-system disease, and up to 15% of the hospitalised cases may die. Lassa fever is also associated with occasional epidemics, including nosocomial outbreaks, during which the case-fatality rate can reach 50%. Early treatment with the antiviral drug ribavirin is effective, and infection can be prevented by practising good hygiene.

Several studies estimate that between 100 000 and 300 000 Lassa fever cases with about 5 000 deaths occur each year [2]. In Nigeria, 989 cases with 36 deaths were reported in 2014; in 2013, 1 195 cases with 39 deaths were reported. In Liberia, the Ministry of Health has notified WHO of an outbreak of Lassa fever in February/March 2014 (14 laboratory-confirmed cases). In Benin, 16 cases (two confirmed, seven probable and seven suspected cases), nine of them fatal, were reported in 2014 [3,4].

The last travel-related case of Lassa fever in Europe was reported in the United Kingdom in 2009 [5]. In 2015, the US notified a fatal Lassa fever case in a traveller from Liberia to the United States. This case was the sixth known occurrence of Lassa fever in a traveller returning to the United States since 1969 [6]. In 2016, one case of Lassa fever was medically evacuated from Togo to Germany. The patient later died in a German hospital. When the corpse was prepared for flight repatriation, a staff member of the funeral home caught the disease [7].

Public health conclusions

Primary transmission of the Lassa virus from its host to humans can be prevented by avoiding contact with Mastomys rodents, especially in regions where outbreaks occur [2].

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Additional information

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Annex

Table. Lassa fever, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Legionnaires' disease

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Legionnaires' Disease. [Internet]. 2016 [cited YYYY MMM DD]. Available from: http://ecdc.europa.eu/en/healthtopics/legionnaires_disease/surveillance/Annual-Epidemiological-Report-2016.aspx

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Key facts

- Legionnaires' disease remains an uncommon, mainly sporadic respiratory infection with low notification rates in EU/EEA countries (overall 1.4 per 100 000 inhabitants).
- Five countries (France, Germany, Italy, Portugal and Spain) accounted for 74% of notified cases.
- One outbreak involving more than 400 cases occurred in Vila Franca de Xira near Lisbon, Portugal.
- Regular checks for Legionella and appropriate control measures in man-made water systems may prevent a significant proportion of Legionnaires' disease cases.

Methods

Click here for a detailed description of the methods used to produce this annual report

This surveillance report is based on Legionnaires' disease (LD) surveillance data collected by the European Legionnaires' Disease Surveillance Network (ELDSNet) for 2014. ELDSNet involves 30 EU/EEA Member States (28 EU Member States plus Iceland and Norway).

The surveillance data were collected through two different schemes:

1) Annual retrospective data collection of LD cases in EU Member States, Iceland and Norway.

2) Near-real-time reporting of travel-associated cases of Legionnaires' disease (TALD), including reports from countries outside the EU/EEA. This scheme aims primarily at identifying clusters of cases that may otherwise not have been detected at the national level, which makes it possible to quickly investigate the reports and take control measures at the implicated accommodation sites to prevent further infections.

In 2014, disease surveillance can be summarised as follows:

All 30 EU/EEA Member States reported case-based LD data. Countries were asked to report cases in accordance with the 2012 EU/EEA case definition: probable cases with an epidemiological link only should no longer be reported.

Twenty-five EU/EEA countries and seven non-EU/EEA countries reported TALD cases. TALD cases are defined as travellers having stayed at a commercial or public accommodation site in the two to ten days before the onset of disease. It does not include cases of LD among travellers who stayed with relatives or friends.

A single TALD case was defined as a person who stayed at an accommodation site not associated with LD cases in the previous two years. A TALD cluster was defined as two or more cases who stayed at the same accommodation site and whose dates of onset were within two years of each other.

A summary of national surveillance systems characteristics is available in the Annex.

Epidemiology

In 2014, 30 countries reported 6 943 cases, 6 412 (92.4%) of which were classified as confirmed. The remaining 531 (7.6%) cases were reported as probable (Table 1). The number of notifications per 100 000 inhabitants was 1.4 in 2014, which was the highest ever observed. Age-standardised notification rates did not differ substantially from crude rates. Of 5 505 cases with known outcome, 456 were reported to have died, giving a case fatality of 8%.

L. pneumophila serogroup 1 was the most commonly identified pathogen, accounting for 81% of culture-confirmed cases.

Five countries (France, Germany, Italy, Portugal and Spain) accounted for 74% of all notified cases (Table 1 and Figure 1). Notification rates ranged from less than 0.1 per 100 000 inhabitants in Bulgaria, Poland and Romania to 5.6 per 100 000 in Portugal (Table 1, Figure 2). The high rate in Portugal was mainly driven by the large community outbreak that occurred in Vila Franca de Xira near Lisbon in October and November 2014 [1].

As in previous years, most cases (69%) were community-acquired, while 20% were travel-associated. Eight per cent were associated with healthcare facilities, and 3% were associated with other settings.

Table 1. Number and rate of Legionnaires' disease cases per 100 000 population by country and year, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	80	1.0	101	1.2	104	1.2	100	1.2	Y	C	133	1.6	1.4	122
Belgium	89	0.8	79	0.7	84	0.8	155	1.4	Y	C	200	1.8	1.7	167
Bulgaria	1	0.0	0	0.0	0	0.0	1	0.0	Y	C	1	0.0	0.0	1
Croatia	.	.	.	.	.	.	16	0.4	Y	C	25	0.6	0.5	25
Cyprus	2	0.2	1	0.1	7	0.8	6	0.7	Y	C	6	0.7	0.8	6
Czech Republic	38	0.4	57	0.5	56	0.5	67	0.6	Y	C	110	1.0	1.0	108
Denmark	133	2.4	123	2.2	127	2.3	113	2.0	Y	C	158	2.8	2.6	116
Estonia	0	0.0	7	0.5	3	0.2	10	0.8	Y	C	8	0.6	0.6	7
Finland	24	0.4	9	0.2	10	0.2	15	0.3	Y	C	10	0.2	0.2	9
France	1540	2.4	1170	1.8	1298	2.0	1262	1.9	Y	C	1348	2.0	2.0	1325
Germany	688	0.8	637	0.8	628	0.8	811	1.0	Y	C	833	1.0	0.9	606
Greece	9	0.1	18	0.2	29	0.3	38	0.3	Y	C	27	0.2	0.2	26
Hungary	60	0.6	37	0.4	33	0.3	29	0.3	Y	C	32	0.3	0.3	31
Iceland	2	0.6	3	0.9	2	0.6	.	.	Y	C	4	1.2	1.3	2
Ireland	11	0.2	7	0.2	15	0.3	14	0.3	Y	C	8	0.2	0.2	8
Italy	1238	2.1	1021	1.7	1346	2.3	1363	2.3	Y	C	1476	2.4	2.1	1435
Latvia	6	0.3	49	2.4	48	2.3	34	1.7	Y	C	38	1.9	1.8	23
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	1	0.0	2	0.1	9	0.3	1	0.0	Y	C	8	0.3	0.3	6
Luxembourg	10	2.0	6	1.2	5	1.0	7	1.3	Y	C	5	0.9	0.9	4
Malta	6	1.4	9	2.2	4	1.0	2	0.5	Y	C	9	2.1	-	9
Netherlands	466	2.8	311	1.9	304	1.8	308	1.8	Y	C	348	2.1	2.0	327
Norway	48	1.0	33	0.7	25	0.5	40	0.8	Y	C	51	1.0	1.0	41
Poland	36	0.1	18	0.0	8	0.0	11	0.0	Y	C	12	0.0	0.0	10
Portugal	128	1.2	89	0.8	140	1.3	94	0.9	Y	C	588	5.6	5.2	557
Romania	1	0.0	1	0.0	3	0.0	1	0.0	Y	C	1	0.0	0.0	1
Slovakia	4	0.1	7	0.1	4	0.1	6	0.1	Y	C	14	0.3	0.2	14
Slovenia	58	2.8	44	2.1	81	3.9	77	3.7	Y	C	59	2.9	2.7	59
Spain	1150	2.5	706	1.5	972	2.1	815	1.7	Y	C	925	2.0	1.9	916
Sweden	100	1.1	127	1.3	102	1.1	122	1.3	Y	C	136	1.4	1.3	95
United Kingdom	376	0.6	251	0.4	401	0.6	331	0.5	Y	C	370	0.6	0.6	356
EU/EEA	6305	1.3	4923	1.0	5848	1.1	5849	1.1	.	C	6943	1.4	1.2	6412

ASR: age-standardised rate, C: case-based

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, 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 1. Rate of confirmed Legionnaires' disease cases per 100 000 population by country, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, 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.

The distribution of cases by month of reporting peaked in August and November. Most cases (68.9%) had a date of onset between July and December (Figure 2).

Figure 2. Number of confirmed Legionnaires' disease cases by month, EU/EEA, 2014 and 2010–2013

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

Following an unexpectedly high peak of LD in August 2010, which was mostly driven by unusually high numbers of community-acquired cases reported by France, Germany and the Netherlands [2], a slightly increasing trend was observed over the 2011–2014 period (Figure 3).

Figure 3. Number of confirmed Legionnaires' disease cases by month and 12-month moving average, EU/EEA, 2010–2014

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

In 2014, people aged 45 years and older accounted for 6 134 (88.4%) of 6 935 cases with known age. The notification rate increased with age, from ≤0.1 per 100 000 in those under 25 years of age to 3.3 in persons aged 65 years and above (5.0 per 100 000 in males and 1.9 in females) (Figure 4). The overall male-to-female ratio was 2.6:1.

Figure 4. Rate of Legionnaires' disease cases per 100 000 population, by age and gender, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, 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.

Travel-associated Legionnaires' disease

For 2014, 953 travel-associated cases were reported through the near-real-time surveillance scheme, 21% more than in 2013. A total of 132 new travel-associated clusters were detected in 25 countries, compared to 110 in 2013 and 99 in 2012. In 2014, 55% of all detected clusters of travel-associated Legionnaires' disease associated with only one accommodation site involved cases from more than one country. These clusters would probably not have been detected had it not been for the international surveillance of the ELDSNet network.

Threats

Between 1 January and 31 December 2014, ECDC monitored 13 threats related to Legionnaires' disease. Twelve were rapidly evolving clusters (≥3 cases with onset within 3 months), and one was related to the previously mentioned community outbreak in Vila Franca de Xira, Portugal [1].

Discussion

With 6 943 cases reported, the notification rate of LD in the EU/EEA in 2014 was 1.4 cases per 100 000 population, the highest ever observed. This increase may be partly explained by the large community outbreak in Portugal and an increased number of travel-associated cases reported to the network in 2014. The reasons behind the increasing trend observed since 2011 should be explored further.

Many countries had a notification rate below 0.5, several even below 0.1 cases per 100 000, a situation unchanged over the past five years and unlikely to reflect the true incidence of LD in these countries.

The main characteristics of the cases reported in 2014 were very similar to those reported in previous years: most cases were sporadic and community acquired, and the disease affected mostly older males.

Public health conclusions

Legionnaires' disease remains an important cause of potentially preventable morbidity and mortality in Europe. Large outbreaks such as the one in Portugal remind us of the challenges in preventing and controlling Legionnaires' disease. Further review and sharing of best practice in cooling tower maintenance could help prevent large outbreaks in the future.

The priority for addressing the apparent gap in surveillance is to assist countries with notification rates below one per million inhabitants in order to improve both the diagnosis and the reporting of Legionnaires' disease.

Regular checks for the presence of Legionella bacteria and appropriate control measures applied to man-made water systems may prevent cases of Legionnaires' disease at tourist accommodations, in hospitals, in long-term healthcare facilities or other settings where sizeable populations at higher risk may be exposed [3].

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Annex

Table. Legionnaires' disease, surveillance systems overview, 2014

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Lymphogranuloma venereum

Reporting on data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Lymphogranuloma venereum. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/chlamydia/lymphogranuloma-venereum/Pages/Annual-Epidemiological-Report-2016.aspx

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Key facts

- In 2014, 1 416 cases of LGV were reported in 21 countries.
- Three countries (France, the Netherlands and the United Kingdom) accounted for 87% of notified cases.
- Almost all cases were reported among men who have sex with men; in those cases with known HIV status, 87% were HIV positive in 2014.
- The number of cases reported in 2014 increased by 32% compared with 2013.
- A number of countries have not reported LGV cases over the years, suggesting considerable under-diagnosis and underreporting.

Methods

Click here for a detailed description of the methods used to produce this annual report

In 2014, the majority of reporting countries (12) used the EU case definitions. Four countries reported using national case definitions, and five countries did not report which case definition they were using. Surveillance systems for LGV in Europe vary: 14 countries reported having comprehensive surveillance systems, but five countries operate sentinel systems which only capture LGV diagnoses from a selection of clinics (Annex).

Reporting of LGV infection is compulsory in all countries with comprehensive systems, with a few exceptions: the United Kingdom has a comprehensive system, but reporting is not compulsory; reporting is compulsory in Hungary, which has a sentinel system. Reporting is voluntary in the remainder of countries with sentinel systems.

Rates of LGV infection are not calculated because many LGV surveillance systems are not able to generate data that are considered representative of the national population. There are also significant differences in the availability of LGV diagnostics across Europe.

Epidemiology

In 2014, 21 countries provided data on the reporting of LGV cases. Eleven of these 21 countries reported a total of 1 416 cases, while the remaining 10 countries reporting zero cases (Table 1). Compared with 2013, the number of cases reported in 2014 increased by 32%. All countries except Finland, Italy and Malta reported an increase in case numbers. The largest proportional increase was reported in Ireland (sixfold) and the Czech Republic (1.5-fold).

Transmission category was reported for 889 cases in 2014 (63% of all reported cases). All but four were reported among MSM. Age was reported for all but one case, with the large majority of cases distributed evenly among 25–34-year-olds (29%), 35–44-year-olds (34%) and those aged 45 years or over (33%) (Figure 1).

In 2014, information on HIV status was available for 1 354 LGV cases (96%), of whom 54% were reported as HIV positive, 8% as HIV negative and 38% as unknown. Of cases with known HIV status, 87% were HIV positive. Between 2005 and 2014, information on HIV status was available for 4 647 cases (74% of all reported cases), of whom 65% were reported as HIV positive, 14% as HIV negative, and 21% as unknown.

Between 2005 and 2014, 6 303 cases of LGV were reported in 12 countries, with the majority of cases reported in the United Kingdom (53%; 3 367 cases), France (20%; 1 276 cases) and the Netherlands (16%; 1 023 cases). The overall increasing trend for reported cases of LGV between 2005 and 2014 is due to an increase in the number of reporting countries and an increase in case number in most of the reporting countries (Figure 2).

Table 1. Number of reported LGV cases, EU/EEA, 2010–2014

Download Excel version

Country	2010	2011	2012	2013	2014
Austria	-	-	-	-	-
Belgium	22	21	23	48	60
Bulgaria	-	-	-	-	-
Croatia	-	-	0	0	0
Cyprus	0	0	0	0	0
Czech Republic	1	6	9	8	20
Denmark	20	29	24	32	36
Estonia	0	0	0	0	0
Finland	0	3	5	7	2
France	184	191	197	327	377
Germany	-	-	-	-	-
Greece	-	-	-	-	-
Hungary	0	0	1	2	3
Iceland	0	0	0	0	0
Ireland	1	0	3	5	35
Italy	6	11	27	21	12
Latvia	0	0	0	0	0
Liechtenstein	-	-	-	-	-
Lithuania	-	-	-	-	-
Luxembourg	0	0	0	0	0
Malta	0	0	0	1	0
Netherlands	66	70	190	112	172
Norway	0	0	0	0	21
Poland	0	0	0	0	0
Portugal	-	-	-	-	-
Romania	-	-	-	-	-
Slovakia	-	-	-	-	-
Slovenia	0	0	0	0	0
Spain	-	-	-	-	-
Sweden	0	0	0	0	0
United Kingdom	428	408	402	512	678
EU/EEA total	728	739	881	1075	1416

Source: Country reports
Legend: - = no report

Figure 1. Age distribution of reported confirmed LGV cases, EU/EEA, 2014

Source: Country reports

Figure 2. Number of reported confirmed LGV cases for selected EU/EEA Member States, 2005–2014

Source: Country reports from Belgium, Denmark, France, the Netherlands, the United Kingdom.

Discussion

In 2014, the number of reported cases of LGV continued to increase in western and central European countries. The largest increases were reported from Ireland and the Czech Republic, but many other countries also reported increases. The number of reported cases is an underestimate because many countries do not routinely report LGV and the diagnosis of LGV requires confirmation through genotyping. The increase in reported cases indicates that LGV transmission continues mainly among HIV-positive MSM undertaking high-risk practices [1-3]. Different, and at times insufficient, testing strategies fail to detect a substantial number of asymptomatic cases [4].

Public health conclusions

The increasing number of cases of LGV in Europe mirror the trend for other sexually transmitted diseases, with increases predominantly due to transmission between MSM. Effective interventions need to be identified and targeted at this group of predominantly HIV-positive MSM who might have less incentive to use condoms. In addition, clinical suspicion and early diagnosis is essential in order to prevent complications. In many parts of Europe, surveillance for LGV is not well developed due to limited availability of diagnostics. Little information is therefore available on the incidence of the infection in some parts of Europe. An ECDC project will be piloting enhanced LGV surveillance in these countries in order to try to shed more light on the scope of the problem.

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Additional information

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Annex. Surveillance systems overview

Table 2. Lymphogranuloma venereum, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Malaria

Reporting on 2014 data retrieved from TESSy* on 19 November 2015
Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Malaria. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/malaria/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- 6 017 confirmed malaria cases were reported to TESSy in 2014.
- The notification rate in 2014 was 1.24 cases per 100 000 population.
- 99.9% of cases for which travel information was provided were travel related. Five cases were locally acquired (three reported by Spain and two by France).
- The highest notification rates were reported in males in age groups 15–24 and 25–44 years.
- The number of cases increased during the summer months, and a smaller upsurge was observed in January. This reflects most probably travel patterns.
- The worldwide decrease in malaria incidence did not yet result in a decrease of travel-related cases reported in the EU/EEA. Therefore, awareness among travellers and clinicians, particularly among those visiting friends and relatives in endemic countries, should be maintained.
- Local transmission of Plasmodium vivax remains possible in the EU and stresses the need for continued surveillance, preparedness and prevention.

Methods

Click here for a detailed description of the methods used to produce this annual report

• 26 EU/EEA countries provided information on malaria. No data were reported by Denmark, Germany, Iceland, Italy and Liechtenstein.

• 23 countries used the EU case definition, two countries (Belgium and Finland) did not specify which case definition was used, and one country used an alternative case definition (France). Surveillance is mostly case based except in Bulgaria and Croatia. The surveillance coverage for France is not nationwide.

• All reporting countries have a comprehensive surveillance system. Reporting is compulsory in 23 countries, voluntary in two countries (Belgium and France), and not specified in the United Kingdom. Disease surveillance is mostly passive except in Belgium, the Czech Republic, Slovakia and the United Kingdom, where active surveillance is in place. Greece also has active disease surveillance in high-risk areas. (Annex 1).

Epidemiology

Most reported malaria cases were travel related. Five cases were reported as locally acquired: two in France and three in Spain. The Spanish malaria cases were characterised as follows:

• One case of congenital Plasmodium falciparum malaria. A newborn whose mother had recently returned from Equatorial Guinea was diagnosed with malaria one week after birth. The baby had no symptoms but the laboratory tests identified P. falciparum.

• Induced infection: Plasmodium malariae in a patient who had received a kidney transplant. The donor had travelled to Equatorial Guinea. An antigenic study and a smear test were carried out before the transplant; both were negative. Two transplant recipients from the same donor did not develop symptoms, also with negative laboratory tests results. Both patients received preventive malaria treatment.

• Introduced infection: a Plasmodium vivax case. The patient had no history of travel or hospitalisation but lived a few kilometres from a town with a travel-related case. Molecular typing showed that the same strain of P. vivax was responsible for both infections. No infected mosquitoes were found during the entomological investigation.

The two locally acquired cases in France should be interpreted with caution: according to the French case definition, malaria cases are classified by default as locally acquired unless patients report that they travelled to malaria-endemic areas in the previous 12 months. The two patients did not report any recent travel but the investigation could not be completed because both patients were undocumented residents.

Greece recorded zero locally acquired cases in 2014, compared with three cases in 2013 and 20 cases in 2012.

The overall confirmed case rate in 2014 was 1.24 cases per 100 000 population, which is the highest rate observed during the period 2010–2014. The individual country rates varied between 0.05 cases (Poland) and 3.67 cases (Sweden) per 100 000 population. The rates in Sweden and Norway were notably higher than in previous years. In Sweden, the notification rate in 2014 was 3.67 cases (2013: 1.25 cases per 100 000 population), while in Norway the 2014 rate was 2.35 cases per 100 000 population (2013: 1.43 cases).

The highest number of confirmed cases notified in 2014 was observed in France (n=2 299), followed by the United Kingdom (n=1 510) (Table 1).

Table 1. Reported malaria cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014				
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Confirmed cases	Rate	ASR
Austria	48	0.6	7	0.1	28	0.3	42	0.5	Y	C	68	68	0.8	0.8
Belgium	166	1.5	184	1.7	206	1.9	253	2.3	Y	C	235	235	2.1	2.2
Bulgaria	5	0.1	8	0.1	16	0.2	8	0.1	Y	A	10	10	0.1	0.1
Croatia	.	.	.	.	23	0.5	0	0.0	Y	A	6	6	0.1	0.1
Cyprus	1	0.1	6	0.7	1	0.1	3	0.3	Y	C	8	8	0.9	0.9
Czech Republic	11	0.1	28	0.3	25	0.2	27	0.3	Y	C	30	30	0.3	0.3
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	1	0.1	1	0.1	6	0.5	3	0.2	Y	C	3	3	0.2	0.2
Finland	33	0.6	33	0.6	46	0.9	38	0.7	Y	C	39	39	0.7	0.8
France	2439	-	1891	-	1851	-	2165	-	N	C	2299	2299	-	-
Germany	615	0.8	562	0.7	547	0.7	637	0.8	.	.	.	.	.	.
Greece	45	0.4	92	0.8	95	0.9	25	0.2	Y	C	38	38	0.3	0.4
Hungary	5	0.0	10	0.1	5	0.1	5	0.1	Y	C	15	15	0.2	0.2
Iceland	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ireland	82	1.8	61	1.3	65	1.4	71	1.5	Y	C	79	79	1.7	1.7
Italy	662	1.1	.	.	.	.	.	.	.	.	.	.	.	.
Latvia	5	0.2	4	0.2	3	0.1	4	0.2	Y	C	6	6	0.3	0.3
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	3	0.1	3	0.1	6	0.2	8	0.3	Y	C	5	5	0.2	0.2
Luxembourg	12	2.4	3	0.6	7	1.3	4	0.7	Y	C	3	3	0.5	0.5
Malta	0	0.0	1	0.2	2	0.5	5	1.2	Y	C	3	3	0.7	0.7
Netherlands	247	1.5	253	1.5	194	1.2	162	1.0	Y	C	276	276	1.6	1.7
Norway	37	0.8	30	0.6	37	0.7	72	1.4	Y	C	120	120	2.3	2.3
Poland	35	0.1	14	0.0	21	0.1	36	0.1	Y	C	19	19	0.0	0.0
Portugal	50	0.5	67	0.6	71	0.7	117	1.1	Y	C	144	144	1.4	1.4
Romania	19	0.1	40	0.2	32	0.2	43	0.2	Y	C	47	47	0.2	0.2
Slovakia	2	0.0	1	0.0	6	0.1	4	0.1	Y	C	5	5	0.1	0.1
Slovenia	9	0.4	6	0.3	7	0.3	3	0.1	Y	C	7	7	0.3	0.3
Spain	351	0.8	405	0.9	421	0.9	518	1.1	Y	C	688	688	1.5	1.5
Sweden	115	1.2	95	1.0	85	0.9	119	1.2	Y	C	354	354	3.7	3.8
United Kingdom	1761	2.8	1677	2.7	1378	2.2	1501	2.3	Y	C	1510	1510	2.3	2.4
EU/EEA	**6759**	**1.0**	**5482**	**1.0**	**5184**	**0.9**	**5873**	**1.0**	**.**	**C**	**6017**	**6017**	**1.2**	**1.3**

Source: Country reports. Legend: Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate

Figure 1. Number of reported and confirmed malaria cases, EU/EEA, 2014

Note: 99.9% of the cases are imported.

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Finland, France, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Age and gender distribution

In 2014, the overall rate of confirmed malaria cases was higher among men than women (1.75 cases and 0.74 cases per 100 000 population, respectively), and the male-to-female ratio was 2.4:1. The highest notification rate for males was in the 25–44-year-old age group (2.73 cases per 100 000 population), followed by the group of 15–24-year-olds (2.68 cases per 100 000 population).

Among females, the highest notification rate was in the age groups 15–24 years old and 25–44 years old (1.22 cases per 100 000 and 1.10 cases per 100 000 population, respectively) (Figure 2).

Figure 2. Confirmed malaria cases, by age and gender, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Seasonality

A marked seasonal trend was observed across all countries, with cases increasing during the summer holiday months (July–September) and a lower increase in January.

Figure 3. Seasonal distribution of confirmed malaria cases, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Trend

In the period 2010–2014 the highest number of reported cases was seen in 2014, but overall the trend appears to be stable.

Figure 4: Trend and number of confirmed malaria cases, EU/EEA, 2010–2014

Source: Country reports from: Austria, Belgium, Cyprus, Czech Republic, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Discussion

The confirmed notification rate of malaria reported by EU and EEA countries has remained stable over the last few years and hovers at about 100 000 population per year, with a slight increase in 2014 (1.24 cases per 100 000 population) compared with 2010–2013 .

WHO reported that between 2000 and 2015, the rate of new cases of malaria worldwide fell by 37%. Malaria mortality rates decreased by 60% among all age groups globally, and an estimated 6.2 million malaria deaths were averted globally since 2000 [1]. Current malaria control interventions seem to have considerably reduced the malaria incidence in Africa and outside Africa [2, 3]. The reduction in global malaria incidence did not yet result in a decline of the notification rate observed in the EU/EEA.

Nearly all (99.9%) of the reported malaria cases were imported and notified by EU and EEA countries that have strong ties with endemic areas (e.g. France and its French overseas territories). Seasonality and age distribution most likely reflect travel patterns to malaria-endemic countries. Information on the reasons for travel, i.e. holidays, visiting friends and relatives, or business, was not available. Travellers visiting friends and relatives in endemic countries constitute a significant group for malaria importation to the EU [4]. A review of the literature suggests that a substantial proportion of imported malaria cases in the EU/EEA occur among recent immigrants from malaria-endemic countries and among more settled migrants and their families who have travelled to visit friends and relatives in malaria-endemic home countries [5]. Outside continental Europe, some European territories are endemic for malaria (e.g. Mayotte and French Guiana); data for these regions are not collected through TESSy.

A small number of autochthonous transmission of malaria was reported over the last 10 years [6-9]. In 2014, one case of locally acquired Plasmodium vivax malaria was reported from Spain. In 2014, for the first time since 2009, Greece did not report any locally acquired cases. In 2015, however, Greece reported six locally acquired Plasmodium vivax malaria cases. One case each was reported from Farkadona–Trikala regional unit, Evrotas–Lakonia regional unit, Tempi–Larisa regional unit, Thiva–Viotia regional unit; two cases were notified in Marathon–East Attica regional unit [10].

Public health conclusions

The worldwide decrease in malaria incidence did not yet result in a decrease of the travel related malaria cases reported in the EU/EEA. Therefore, awareness among clinicians and travellers, particularly among those visiting friends and relatives in endemic countries, should be maintained high. Vigilance remains needed regarding transmission through substances of human origin (SoHO) e.g. blood products or organ transplant.

The data also indicate that local transmission of Plasmodium vivax remains possible in the EU, though the transmission route is not always easily detected. This emphasises the need for surveillance, preparedness and prevention in the EU/EEA. Further steps should be taken to improve the access to healthcare for migrants.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annex

Table. Malaria, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Invasive meningococcal disease

Reporting on 2014 data retrieved from TESSy* on 7 July 2016

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Invasive meningococcal disease. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from http://ecdc.europa.eu/en/healthtopics/meningococcaldisease/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 2 760 confirmed cases of invasive meningococcal disease were reported to TESSy.
- The notification rate was 0.5 cases per 100 000 population, which is lower than in previous years.
- Age-specific rates were highest in infants (10.1 cases per 100 000 population), followed by 1–4-year-olds (2.5 cases per 100 000 population).
- The majority of cases were caused by serogroup B (64%).
- Serogroup C is more prominent in countries that do not have the meningococcal C conjugate (MCC) vaccine in their routine national immunisation schedules.
- Continued strengthening of disease surveillance for invasive meningococcal is essential to evaluate the impact of ongoing immunisation programmes and to support decision-makers in view of the availability of new vaccines.

Methods

Click here for a detailed description of the methods used to produce this annual report

ECDC has coordinated the surveillance of invasive meningococcal disease (IMD) at the European level since the transfer of EU-IBIS (European Union Invasive Bacterial Infections Surveillance Network) to ECDC in 2007.

• In 2014, data were reported by 30 Member States.

• In 2014, 11 Member States used the EU-2012 case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012), 14 Member States used the EU-2008 definition, and one Member State used the EU-2002 case definition. Four Member States used alternative case definitions.

• Surveillance systems used by Member States for reporting data on IMD to ECDC are heterogeneous, with differences in the type of system in place, population coverage of the system, and method of data reporting. For example, some systems are based on clinical syndromes such as meningitis while other systems rely exclusively on laboratory results, with the number of performed blood cultures varying. Surveillance systems in Member States and at the European level also change and develop over time, for example in respect to representativeness and reporting procedures.

• All national surveillance systems provide full national coverage, and all countries – except for Bulgaria and Croatia – report case-based data (see Annex).

Epidemiology

In 2014, 2 760 confirmed cases of IMD were reported by 30 EU/EEA countries. The notification rate was 0.5 cases per 100 000 population (0.7 cases per 100 000 population in both 2012 and 2013; Table 1, Figure 1). The highest notification rates were observed in Malta (3.1 cases per 100 000 population), Lithuania (1.8), Ireland (1.7) and the UK (1.2) (Table 1, Figure 2).

Table 1. Reported confirmed cases of invasive meningococcal disease cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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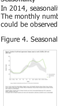
Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	85	1.0	49	0.6	56	0.7	56	0.7	Y	C	37	35	0.4	0.4
Belgium	96	0.9	111	1.0	123	1.1	134	1.2	Y	C	87	87	0.8	0.8
Bulgaria	8	0.1	13	0.2	8	0.1	12	0.2	Y	A	15	13	0.2	0.2
Croatia	.	.	.	.	41	1.0	26	0.6	Y	A	33	33	0.8	0.7
Cyprus	1	0.1	1	0.1	6	0.7	2	0.2	Y	C	4	4	0.5	0.4
Czech Republic	60	0.6	63	0.6	59	0.6	59	0.6	Y	C	42	42	0.4	0.4
Denmark	66	1.2	72	1.3	56	1.0	55	1.0	Y	C	45	45	0.8	0.8
Estonia	2	0.2	7	0.5	6	0.5	6	0.5	Y	C	4	3	0.2	0.2
Finland	34	0.6	34	0.6	33	0.6	20	0.4	Y	C	21	21	0.4	0.4
France	511	0.8	563	0.9	550	0.8	575	0.9	Y	C	426	420	0.6	0.6
Germany	386	0.5	369	0.5	354	0.4	345	0.4	Y	C	275	273	0.3	0.4
Greece	55	0.5	52	0.5	59	0.5	59	0.5	Y	C	60	60	0.5	0.6
Hungary	37	0.4	67	0.7	51	0.5	47	0.5	Y	C	33	33	0.3	0.4
Iceland	2	0.6	2	0.6	1	0.3	1	0.3	Y	C	1	1	0.3	0.2
Ireland	98	2.2	89	1.9	60	1.3	77	1.7	Y	C	78	76	1.7	1.3
Italy	150	0.3	152	0.3	135	0.2	162	0.3	Y	C	156	156	0.3	0.3
Latvia	5	0.2	2	0.1	4	0.2	6	0.3	Y	C	9	7	0.3	0.4
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	48	1.5	42	1.4	53	1.8	76	2.6	Y	C	71	53	1.8	1.9
Luxembourg	1	0.2	2	0.4	3	0.6	3	0.6	Y	C	3	3	0.5	0.5
Malta	2	0.5	6	1.4	3	0.7	12	2.8	Y	C	19	13	3.1	3.1
Netherlands	143	0.9	106	0.6	110	0.7	108	0.6	Y	C	83	83	0.5	0.5
Norway	39	0.8	37	0.8	24	0.5	27	0.5	Y	C	18	18	0.4	0.3
Poland	228	0.6	282	0.7	238	0.6	250	0.7	Y	C	188	187	0.5	0.5
Portugal	79	0.7	77	0.7	69	0.7	61	0.6	Y	C	53	52	0.5	0.5
Romania	52	0.3	68	0.3	71	0.4	52	0.3	Y	C	70	67	0.3	0.3
Slovakia	37	0.7	21	0.4	31	0.6	18	0.3	Y	C	29	23	0.4	0.4
Slovenia	9	0.4	13	0.6	9	0.4	11	0.5	Y	C	8	8	0.4	0.4
Spain	404	0.9	431	0.9	335	0.7	262	0.6	Y	C	198	146	0.3	0.3
Sweden	67	0.7	68	0.7	103	1.1	74	0.8	Y	C	49	48	0.5	0.5
United Kingdom	1008	1.6	1036	1.6	862	1.4	852	1.3	Y	C	758	750	1.2	1.1
EU/EEA	**3713**	**0.7**	**3835**	**0.8**	**3513**	**0.7**	**3448**	**0.7**	**.**	**C**	**2873**	**2760**	**0.5**	**0.5**

Source: Country reports. Legend: Y = yes, N = no, C = case based, ' = no report, ASR: age-standardised rate

Figure 1. Reported confirmed cases of invasive meningococcal disease, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, 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 2. Number of cases of Reported confirmed invasive meningococcal disease per 100 000 population, EU/EEA, 2014



Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, 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.

Age and gender distribution

In 2014, IMD was predominantly found in infants and young children (Figure 3), with a notification rate of 10.1 confirmed cases per 100 000 population in children under one year of age, and 2.5 confirmed cases per 100 000 population in 1–4-year-olds. When stratifying by gender, there was a slight predominance of cases in males versus females in the age groups under 45 years (Figure 3). The overall male-to-female ratio was 1.1:1.

Figure 3. Reported confirmed cases of invasive meningococcal disease cases, by age and gender, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, 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.

Seasonality

In 2014, seasonality followed a pattern similar to previous years. IMD occurred primarily in the winter months, while the number of cases was lowest in summer (Figures 4 and 5). The monthly number of cases in 2014 was consistently lower than the mean number of cases in 2010–2013 (Figure 4). Overall, a declining trend in the number of IMD cases could be observed (Figure 5).

Figure 4. Seasonal distribution of Reported confirmed cases of invasive meningococcal disease, EU/EEA, 2014 compared with 2010–2013

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

Figure 5. Trend and number of cases of Reported confirmed invasive meningococcal disease, EU/EEA, 2010–2014

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

Serogroup

Of the 2 760 IMD cases reported in 2014, the serogroup was known for 2 456 (89%). Of the cases with known serogroup, the majority belonged to serogroup B (64%), followed by serogroup C (16%) (Table 2). There has been a decrease in serogroup B since 2011 and in serogroup C since 2012. Serogroup W has been increasing since 2011, while serogroup Y has stayed relatively stable (Figure 6). Serogroup B accounted for more than 80% of IMD in children under the age of five years, but only for 31% of cases aged 65 years and over. Serogroup C was most prominent in 25–44-year-olds, accounting for 30% of cases in this age group. Serogroups Y and W were most prominent in those aged 65 years and over, causing 30% and 18% of IMD cases in this age group, respectively (Figure 7).

Table 2. Serogroup distribution of confirmed cases of invasive meningococcal disease, EU/EEA, 2014

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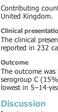
Serogroup	Cases	%
B	1 561	64
C	401	16
Y	240	10
W	185	7
Other	69	3
Total	2 456	100

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

Figure 6. Trend of confirmed cases of invasive meningococcal disease by serogroup, EU/EEA, 2010–2014

Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, 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.

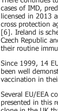
Figure 7. Serogroup distribution of confirmed cases of invasive meningococcal disease by age group, EU/EEA, 2014



Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, 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.

By 2014, 14 EU countries had integrated the meningococcal C conjugate (MCC) vaccine into their routine national childhood immunisation programmes. In countries that have not implemented MCC vaccination, serogroup C accounted for 27% of cases, while in countries that have implemented MCC vaccination, only 14% of the cases were attributed to serogroup C (Figure 7).

Figure 8. Trend and number of cases of reported, confirmed invasive meningococcal disease, EU/EEA, 2010-2014



Contributing countries without MCC vaccination policy: Czech Republic, Denmark, Estonia, Finland, Hungary, Latvia, Lithuania, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Sweden.

Contributing countries with MCC vaccination policy: Austria, Belgium, Cyprus, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, United Kingdom.

Clinical presentation

The clinical presentation was known for 1 351 cases (49%). Meningitis was reported in 552 cases (41%), septicaemia in 462 cases (34%). Both septicaemia and meningitis were reported in 232 cases (17%). The remaining 105 cases (8%) showed a different clinical presentation.

Outcome

The outcome was known for 2 370 cases, 86% of all cases. Among cases with known outcome, 214 were fatal (case fatality: 9%). Case fatality was highest among cases of serogroup C (15%, n=55/355) and lowest among cases of serogroup B (7%, n=95/1 364). Case fatality was highest in cases aged 65 years and over (14%, n=42/300), and lowest in 5–14-year-olds (6%, n=14/234).

Discussion

Invasive meningococcal disease remains rare in EU/EEA countries, with the greatest burden in infants and young children. In 2014, country-specific notification rates ranged from 0.2 to 3.1 cases per 100 000 population. Although IMD is rare, it is a severe and life-threatening disease with relatively high case fatality and with up to one fifth of all survivors suffering from long-term sequelae [1].

There continues to be a decreasing trend in serogroup B, which may be due to a naturally occurring secular trend [2]. However, serogroup B continues to cause the majority of cases of IMD, predominantly affecting the younger age groups. In Europe, a recombinant protein vaccine including outer membrane vesicles against serogroup B (4CMenB) was licensed in 2013 and was estimated to provide protection against between 73% and 87% of circulating serogroup B strains, depending on the country [3], as well as potential cross protection against IMD caused by other serogroups [4, 5]. The United Kingdom introduced 4CMenB into its routine national childhood immunisation programme in 2015 [6]. Ireland is scheduled to introduce the vaccine into its routine immunisation programme in September 2016. The vaccine is recommended, but not funded, in Austria, the Czech Republic and Hungary. Following assessment, some countries, such as France, Greece and Norway, recommended that the 4CMenB vaccine should not be introduced into their routine immunisation programmes. However, in France the vaccine is recommended for persons at increased risk of IMD and during outbreaks.

Since 1999, 14 EU/EEA countries have introduced MCC vaccination into their routine national childhood immunisation programme [6], and the impact of MCC vaccination has been well demonstrated [2, 7-10]. In Europe, serogroup C continues to show a decreasing trend and is proportionally twice as prominent in countries that do not include MCC vaccination in their routine national childhood immunisation programme.

Several EU/EEA countries have reported increasing trends in serogroup Y in recent years [2, 9, 11], although this was not observed at the EU level during the time period presented in this report. Serogroup W has been increasing at the European level since 2011, although this increase is solely related to the rapid epidemic expansion of a single clone in the UK that started in 2009–2010 [12]. In recent years, four countries (the UK, Greece, Austria and the Czech Republic) have introduced the quadrivalent conjugate vaccine MenACYW into their routine vaccination schedules, predominantly as booster doses for adolescents [6]. As carriage rates of Neisseria meningitidis are highest in adolescents and young adults [13], high levels of immunity in this age group are critical to ensure the protection of other vulnerable age groups [14].

Public health conclusions

Several vaccines targeting different serogroups exist for the prevention of invasive meningococcal disease. The choice of introducing a vaccine into the routine national immunisation programme depends on the disease and vaccine attributes, as well as context-specific factors in each country, such as the disease and serogroup burden, cost-effectiveness and feasibility.

Continued strengthening of IMD surveillance is essential to evaluate the impact of ongoing immunisation programmes and to support decision-makers in view of the availability of new vaccines. Surveillance at the European level will become even more important as the incidence of the disease declines, and the pooling of data may enable the description of trends which are difficult to discern at the national level.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

ECDC surveillance report, 2014: http://ecdc.europa.eu/en/publications/Publications/AER-VPD-IBD-2014.pdf

ECDC enhanced surveillance report, 2012: http://ecdc.europa.eu/en/publications/Publications/Surveillance%20of%20IBD%20in%20Europe%202012.pdf

ECDC external quality assurance scheme for Neisseria meningitidis, 2012: http://ecdc.europa.eu/en/publications/Publications/External%20quality%20assessment%20scheme%202012%20for%20Neisseria%20meningitidis%20-%20web.pdf

ECDC surveillance report on invasive bacterial diseases in Europe, 2011: http://ecdc.europa.eu/en/publications/Publications/invasive-bacterial-diseases-surveillance-2011.pdf

ECDC surveillance report on invasive bacterial diseases in Europe, 2010: http://ecdc.europa.eu/en/publications/Publications/invasive-bacterial-diseases-surveillance-2010.pdf

ECDC surveillance report on invasive bacterial diseases in Europe, 2008–2009: http://ecdc.europa.eu/en/publications/Publications/1107_SUR_IBD_2008-09.pdf

ECDC surveillance report on invasive Neisseria meningitidis in Europe, 1999–2000: http://ecdc.europa.eu/en/publications/Publications/0001_TER_Surveillance_network_for_Invasive_Neisseria_Meningitidis.pdf

Network background and EU-IBIS reports: http://www.ecdc.europa.eu/en/activities/surveillance/EU_IBD/background/Pages/Background.aspx

Annex

Table. Invasive meningococcal disease, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Mumps

Reporting on 2014 data retrieved from TESSy* on 7 July 2016
Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Mumps. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/mumps/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 11 069 cases of mumps were reported to TESSy.
- The notification rate was 2.5 cases per 100 000 population, less than half the notification rate observed in 2012 and 2013.
- Young children and adolescents were the most affected age groups.
- The majority of cases were vaccinated, a third with two or more doses.
- The current epidemiology of mumps in Europe may be largely explained by waning immunity and a growing susceptible population.
- High vaccination coverage is of paramount importance to prevent mumps outbreaks.

Methods

Click here for a detailed description of the methods used to produce this annual report

ECDC has coordinated the surveillance of mumps at the European level since the transfer of EUVAC.NET (European surveillance network for selected vaccine-preventable diseases, hosted by Statens Serum Institute, Denmark) to ECDC in 2011.

• In 2014, 28 EU/EEA Member States routinely reported mumps data to TESSy.

• The majority of Member States reported data on mumps in accordance with the 2008 or 2012 EU case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council).

• The majority of Member States reported data from comprehensive, passive surveillance systems with national coverage. For a summary of the surveillance systems characteristics in each Member State, please refer to the Annex.

Epidemiology

In 2014, 28 EU/EEA countries provided mumps surveillance data. In total, 11 069 cases of mumps were reported, of which 5 342 (48%) were laboratory-confirmed. Iceland reported zero cases, while Austria, France and Liechtenstein did not report data. The notification rate of confirmed cases was 2.5 per 100 000 population, less than half the notification rate observed in 2012 (5.4) and 2013 (5.9) (Table 1 and Figure 1).

Slovakia reported the highest notification rate (28.8 cases per 100 000), followed by Ireland (16.0), Poland (6.6) and the Czech Republic (6.4) (Table 1 and Figure 2).

Since 2013, notable increases in the notification rate were observed in Slovakia (4.0 cases per 100 000 in 2013 to 28.8 cases per 100 000 in 2014) and Ireland (4.8 in 2013 to 16.0 in 2014). A substantial decrease in the notification rate was reported by Belgium (40.8 in 2013 to 2.0 in 2014), following a large outbreak in 2012–2013 for which mandatory reporting was introduced [1]. Notable decreases were also observed in the Czech Republic (14.8 in 2013 to 6.4 in 2014) and Spain (12.4 in 2013 to 2.2 in 2014) (Table 1).

Table 1. Reported mumps cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	15	0.2	25	0.3	17	0.2	.	.	.	.	.	.	.	.
Belgium	30	0.3	15	0.1	2684	24.2	4554	40.8	Y	C	228	2.0	2.1	228
Bulgaria	317	4.3	139	1.9	58	0.8	25	0.3	Y	C	31	0.4	0.5	4
Croatia	40	0.9	.	.	0	0.0	32	0.8	Y	C	32	0.8	0.8	0
Cyprus	2	0.2	0	0.0	3	0.3	0	0.0	Y	C	1	0.1	0.1	1
Czech Republic	1068	10.2	2885	27.5	3902	37.1	1553	14.8	Y	C	677	6.4	7.2	333
Denmark	32	0.6	13	0.2	15	0.3	59	1.1	Y	C	43	0.7	0.8	42
Estonia	13	1.0	8	0.6	4	0.3	12	0.9	Y	C	10	0.8	0.8	7
Finland	4	0.1	2	0.0	3	0.1	1	0.0	Y	C	2	0.0	0.0	2
France	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Germany	.	.	.	.	.	.	.	.	Y	C	835	1.0	1.2	543
Greece	2	0.0	1	0.0	2	0.0	0	0.0	Y	C	1	0.0	0.0	1
Hungary	0	0.0	5	0.1	4	0.0	8	0.1	Y	C	2	0.0	0.0	2
Iceland	2	0.6	0	0.0	0	0.0	1	0.3	Y	C	0	0.0	0.0	0
Ireland	120	2.6	73	1.6	44	1.0	222	4.8	Y	C	739	16.0	16.8	298
Italy	909	1.5	965	1.6	975	1.6	746	1.2	Y	C	191	0.3	.	191
Latvia	3	0.1	10	0.5	41	2.0	15	0.7	Y	C	11	0.5	0.6	5
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	87	2.8	64	2.1	62	2.1	67	2.3	Y	C	45	1.5	1.6	45
Luxembourg	.	.	0	0.0	0	0.0	4	0.7	Y	C	1	0.2	0.2	1
Malta	2	0.5	0	0.0	2	0.5	2	0.5	Y	C	3	0.7	0.7	3
Netherlands	424	2.6	642	3.9	408	2.4	201	1.2	Y	C	38	0.2	0.2	34
Norway	12	0.2	16	0.3	30	0.6	35	0.7	Y	C	18	0.4	0.4	18
Poland	1754	7.2	2585	6.8	2773	7.3	2436	6.4	Y	A	2508	6.6	6.3	1
Portugal	140	1.3	134	1.3	160	1.5	159	1.5	Y	C	82	0.8	0.9	4
Romania	242	1.2	202	1.0	163	0.8	98	0.5	Y	C	107	0.5	0.6	28
Slovakia	2	0.0	2	0.0	5	0.1	218	4.0	Y	C	1559	28.8	30.4	426
Slovenia	5	0.2	4	0.2	8	0.4	1	0.0	Y	C	1	0.0	0.0	1
Spain	1351	2.9	2027	4.3	5551	11.9	5813	12.4	Y	C	1026	2.2	2.4	247
Sweden	24	0.3	38	0.4	33	0.3	44	0.5	Y	C	21	0.2	0.2	19
United Kingdom	4383	7.0	2714	4.3	2699	4.3	4568	7.1	Y	C	2858	4.4	4.6	2858
EU/EEA	**11983**	**3.3**	**12569**	**3.5**	**19646**	**5.4**	**20874**	**5.9**	**.**	**C**	**11069**	**2.5**	**2.6**	**5342**

Source: Country reports. Legend: Y = yes, N = no, C = case based, A = aggregated, . = no data reported, ASR: age-standardised rate, - = no notification rate calculated

Figure 1. Number of reported mumps cases, EU/EEA, 2014

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

Figure 2. Number of reported mumps cases per 100 000 population, EU/EEA, 2014

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

Age and gender distribution

In 2014, the most affected age group were the 5–9-year-olds, with a notification rate of 9.0 cases per 100 000 population (Figure 3). This was the most affected age group in the majority of Member States, particularly Slovakia (165.6 cases per 100 000 population) and Poland (44.3). Slovakia also reported high rates among 10–14- (153.5) and 15–19-year-olds (97.7). The second highest notification rate in Europe was observed among 15–19-year-olds (8.2 cases per 100 000), followed by 1–4- (6.4) and 10–14-year-olds (6.4). Fifteen-to-nineteen-year-olds were the most affected age group in the Czech Republic, Ireland, Malta and the United Kingdom. In Ireland, 87% of cases were aged 15 years or older. Males (2.8 cases per 100 000 population) were more often affected than females (2.2 per 100 000) in all age groups, with a male-to-female ratio of 1.3:1.

Figure 3. Reported mumps cases, by age and gender, EU/EEA, 2014

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

Seasonality

In 2014, the highest number of cases was reported at the end of the year and in early spring, whereas the lowest numbers were reported during summer and early autumn (Figures 4 and 5). In previous years, a peak of reported mumps cases was usually seen in early spring. This seasonality is compatible with the known epidemiology of mumps. The peak in early spring was driven by a higher number of cases reported by the United Kingdom (414 cases in April 2014), whereas the winter peak was predominantly due to increases in the number of cases reported by Ireland and Slovakia (200 and 284 cases reported in December 2014, respectively).

Figure 4. Seasonal distribution of reported cases of mumps, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Figure 5: Trend and number of reported cases of mumps, EU/EEA, 2010–2014

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

Vaccination status

Data on vaccination status were available for 9 305 cases (84%). Of these 9 305 cases, 3 066 (33%) were unvaccinated, 2 634 (28%) were vaccinated with one dose, 3 055 (33%) with two doses, and 50 (0.5%) with three or more doses. Five hundred cases (5%) had been vaccinated with an unknown number of doses. Among laboratory-confirmed cases, 47% were unvaccinated, compared to 15% and 25% of probable and possible cases, respectively.

Outcome

Outcome was known for 6 227 cases, 56% of all cases. No deaths were reported in 2014.

Hospitalisation and complications

Of 5 031 cases with known hospitalisation status, 398 (8%) were hospitalised. Data on complications were reported in 3 118 cases, of which 2 830 (90%) had no complication. There were 117 cases of orchitis, 28 cases of pancreatitis, 18 cases of meningitis and three cases of encephalitis. Two cases were complicated with both meningitis and orchitis. Unspecified complications ('other') were reported for another 120 cases. Complications were more frequently reported in adolescents and young adults than in children.

Discussion

In 2014, the notification rate of mumps cases was less than half the notification rate observed in 2012 and 2013. This was predominantly driven by a decrease in the number of cases reported by Belgium and Spain. The decrease in Belgium is likely to be due to a switch back to a sentinel surveillance system from mandatory reporting at the end of 2013. Mandatory notification was introduced in 2012 because of a large outbreak. Some Member States, such as Ireland and Slovakia, did report notable increases in the number of cases. The highest age-specific notification rates in Europe were observed in 5–9- and 15–19-year-olds, although the most affected age groups differed between Member States. Several factors may explain the observed differences in the epidemiology between Member States, including differences in surveillance systems, historical or current vaccination policies, and vaccination coverage levels.

The fact that all EU/EEA Member States have added mumps vaccination to their routine childhood immunisation schedules has significantly reduced the associated disease burden compared to the pre-vaccine period. However, of the mumps cases in Europe in 2014 for which vaccination status was known, the majority were vaccinated, a third of them with at least two doses. Several outbreaks in populations with high vaccination coverage have occurred in recent times, particularly among populations of teenagers and young adults, both in Europe and around the world [1-5]. This may be due to waning immunity in the absence of natural boosting. Studies have shown that the time between the first and second dose [6] and the time after vaccination [1] may play a role in susceptibility to mumps infection, while the immunogenicity and effectiveness varies according to the vaccine strain [7,8]. Also, social conditions that facilitate intense exposure, for example in universities, may increase the transmission of the virus [1,3,5].

Low vaccination coverage may also play a role, as it is associated with a higher risk of mumps outbreaks [6,9], while the risk of complications following mumps infection is lower in previously vaccinated persons than in non-vaccinated individuals [10,11]. In Europe, data are consistent with the understanding that complications are more frequently reported in adolescents and young adults than in children [12].

Public health conclusions

Further research into waning immunity to mumps virus is needed in order to improve future immunisation programmes. Meanwhile, maintaining a high coverage with two doses of measles, mumps and rubella (MMR) vaccine is of paramount importance to prevent mumps outbreaks. Revaccination of adolescents and young adults may be considered to increase vaccination coverage and combat waning immunity, particularly among those who received less than two doses of the vaccine during childhood [6]. The protective effect of vaccination on disease severity is critical and should be considered in current and future mumps prevention and control strategies.

Since all European countries use MMR vaccines in their national childhood immunisation programmes, mumps prevention benefits indirectly from the efforts made to reach the goal of eliminating measles and rubella in Europe.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annual Epidemiological Report 2014 – vaccine-preventable diseases: http://www.ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=1227

Annex

Table. Mumps, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Pertussis

Reporting on 2014 data retrieved from TESSy* on 7 July 2016

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Pertussis. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from http://ecdc.europa.eu/en/healthtopics/Pertussis/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 40 727 cases of pertussis were reported to TESSy by 29 EU/EEA countries.
- The notification rate was 9.1 cases per 100 000 population, higher than in 2013, but lower than in the epidemic year of 2012.
- Germany provided data for the first time in 2014 and reported 12 339 cases (15.3 cases per 100 000 population).
- Age-specific rates were highest in <1-year-olds (51.6 cases per 100 000 population), followed by 10–14- (24.4 per 100 000) and 15–19-year-olds (19.7 per 100 000).
- Eighty-two percent of cases under one year of age were older than six months.
- The clinical presentation of pertussis in adolescents and adults can be mild and is often not recognised. This poses a transmission risk to infants who are too young to have completed the primary pertussis vaccination series.
- Vaccination strategies should be revisited in order to ensure the protection of infants; possible approaches include vaccination of pregnant women and adolescent and adult boosters.

Methods

Click here for a detailed description of the methods used to produce this annual report

ECDC has coordinated the surveillance of pertussis at the European level since the transfer of EUVAC.NET (European surveillance network for selected vaccine-preventable diseases, hosted by Statens Serum Institute, Denmark) to ECDC in 2011.

• In 2014, 29 EU/EEA Member States routinely reported pertussis data to TESSy.

• The majority of Member States reported data on pertussis in accordance with the EU case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council).

• The majority of Member States reported data from comprehensive, passive surveillance systems with national coverage. For a summary of the surveillance system characteristics in each Member State, please refer to the Annex.

Epidemiology

In 2014, 40 727 (38 044 confirmed) cases were reported by 29 EU/EEA countries, 28 of which have national surveillance systems. Iceland and Liechtenstein did not report data (Table 1, Figures 1 and 2). France reported data from a hospital-based sentinel surveillance network reporting only on cases aged <6 months [1]; France was therefore not included in the analysis of notification rates. The notification rate in 2014 was 9.1 per 100 000 population, higher than in 2013, but lower than in the epidemic year of 2012 (Table 1).

Norway reported the highest notification rate, with 59.4 cases per 100 000 population (Table 1 and Figure 2). The Netherlands, the Czech Republic and Slovakia followed with 47.9, 24.0 and 20.7 cases per 100 000 population, respectively. Norway has consistently reported the highest notification rate since 2011. Germany provided data on pertussis for the first time in 2014, reporting 12 339 cases (15.3 cases per 100 000 population). If data from Germany are excluded for 2014, the overall notification rate in 2014 is 7.7 cases per 100 000.

Since 2013, notable increases in the notification rate were observed in the Netherlands (from 17.8 cases per 100 000 population in 2013 to 47.9 cases per 100 000 population in 2014), the Czech Republic (11.7 in 2013 to 24.0 in 2014), Slovenia (8.2 in 2013 to 19.4 in 2014), Denmark (8.6 in 2013 to 13.5 in 2014), Belgium (7.2 in 2013 to 12.5 in 2014), Sweden (2.5 in 2013 to 7.3 in 2014) and Lithuania (2.2 in 2013 to 4.9 in 2014). Belgium has reported a consistently increasing annual notification rate since 2010. Substantial decreases in the notification rate were reported by Latvia (9.9 in 2013 to 4.0 in 2014) and Luxembourg (5.4 in 2013 to 1.1 in 2014). Estonia has reported a consistently decreasing annual notification rate since 2010 (Table 1).

Table 1. Reported pertussis cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	435	5.2	288	3.4	571	6.8	580	6.9	Y	C	370	4.3	4.4	286
Belgium	100	0.9	233	2.1	500	4.5	799	7.2	Y	C	1395	12.5	12.4	1395
Bulgaria	54	0.7	46	0.6	102	1.4	89	1.2	Y	A	52	0.7	0.8	48
Croatia	45	1.0	-	-	0	0.0	109	2.6	Y	C	131	3.1	3.3	92
Cyprus	0	0.0	2	0.2	16	1.9	9	1.0	Y	C	7	0.8	-	5
Czech Republic	661	6.3	324	3.1	737	7.0	1233	11.7	Y	C	2521	24.0	25.7	2303
Denmark	372	6.7	373	6.7	980	17.6	484	8.6	Y	C	762	13.5	13.5	762
Estonia	1295	97.1	478	35.9	149	11.2	55	4.2	Y	C	43	3.3	3.3	43
Finland	343	6.4	555	10.3	541	10.0	192	3.5	Y	C	206	3.8	3.8	206
France*	49	-	92	-	196	-	166	-	N	C	83	-	-	83
Germany	-	-	-	-	-	-	-	-	Y	C	12339	15.3	16.0	11969
Greece	64	0.6	3	0.0	56	0.5	40	0.4	Y	C	15	0.1	0.1	13
Hungary	25	0.2	9	0.1	5	0.1	20	0.2	Y	C	20	0.2	0.2	20
Iceland	0	0.0	0	0.0	36	11.3	31	9.6	-	-	-	-	-	-
Ireland	114	2.5	229	5.0	458	10.0	174	3.8	Y	C	73	1.6	1.2	63
Italy	463	0.8	516	0.9	489	0.8	466	0.8	Y	C	172	0.3	-	172
Latvia	9	0.4	10	0.5	257	12.6	201	9.9	Y	C	81	4.0	4.3	65
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	19	0.6	30	1.0	154	5.1	65	2.2	Y	C	143	4.9	5.1	81
Luxembourg	0	0.0	4	0.8	11	2.1	29	5.4	Y	C	6	1.1	1.1	6
Malta	0	0.0	20	4.8	3	0.7	3	0.7	Y	C	1	0.2	0.2	1
Netherlands	3733	22.5	5447	32.7	12853	76.8	2982	17.8	Y	C	8067	47.9	47.6	8067
Norway	3560	73.3	4405	89.5	4247	85.2	2608	51.6	Y	C	3032	59.4	58.0	3032
Poland	1266	3.3	1669	4.4	4684	12.3	2182	5.7	Y	C	2100	5.5	5.7	731
Portugal	14	0.1	32	0.3	237	2.2	106	1.0	Y	C	74	0.7	0.8	73
Romania	29	0.1	86	0.4	83	0.4	57	0.3	Y	C	87	0.4	0.5	80
Slovakia	1378	25.6	936	17.4	950	17.6	907	16.8	Y	C	1123	20.7	20.7	1112
Slovenia	611	29.8	284	13.9	178	8.7	169	8.2	Y	C	399	19.4	22.3	216
Spain	714	1.5	2325	5.0	1804	3.9	1678	3.6	Y	C	2679	5.8	6.0	2379
Sweden	263	2.8	177	1.9	289	3.0	237	2.5	Y	C	703	7.3	7.2	698
United Kingdom	517	0.8	1256	2.0	11986	18.9	6077	9.5	Y	C	4043	6.3	6.3	4043
EU/EEA	**16133**	**4.4**	**19829**	**5.5**	**42572**	**11.6**	**21748**	**5.9**	**-**	**C**	**40727**	**9.1**	**9.3**	**38044**

Source: Country reports. Legend: Y = yes, N = no, C = case based, A = aggregated, - = no data reported, ASR: age-standardised rate, - = no notification rate calculated
* France reports data from a sentinel surveillance system focusing only on cases <6 months of age

Figure 1. Number of reported pertussis cases, EU/EEA, 2014

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

Figure 2. Number of reported pertussis cases per 100 000 population, EU/EEA, 2014

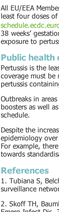
Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United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

Age and gender distribution

Information on age was available for all but 39 cases. In 2014, 46% of cases were aged 30 years or older, and an additional 20% were in the age group 15–29 years. The most affected age group was infants below the age of one, with a notification rate of 51.6 cases per 100 000 population (Figure 3). This was the most affected age group in the majority of Member States, particularly Spain (177.9 cases per 100 000 population). Lithuania, the Netherlands, Slovenia and Sweden also reported a notification rate >100 cases per 100 000 population in this age group. Among infants <1 year old, 93% of cases (n=2 123/2 288) had known month of age. Of these cases, 82% were <6 months of age.

The second highest notification rate was observed among 10–14-year-olds (24.4 cases per 100 000 population), followed by 15–19-year-olds (19.7), 1–4-year-olds (15.0) and 5–9-year-olds (14.3). One-to-four-year-olds were the most affected age group in Estonia, Malta and Luxembourg, 10–14-year-olds were the most affected age group in Denmark, the Netherlands and Slovenia, and 15–19-year-olds were the most affected age group in the Czech Republic, Norway and Slovakia. Females (10.5 cases per 100 000 population) were more often affected than males (8.2 cases per 100 000 population) in all age groups, with a male-to-female ratio of 0.8:1.

Figure 3. Reported pertussis cases, by age and gender, EU/EEA, 2014



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

Seasonality

Typically, pertussis activity has no distinct seasonal pattern, but the number of cases may increase in the summer and autumn (Figures 4 and 5). In 2014, the lowest number of cases was reported in January–February; numbers then gradually increased, reaching a high in July.

Figure 4. Seasonal distribution of reported pertussis cases, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Figure 5: Trend and number of reported pertussis cases, EU/EEA, 2010–2014

Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Vaccination status

Data on vaccination status were available for 28 044 cases (69%). Of these cases, 10 298 (37%) were unvaccinated, 1 832 (7%) were vaccinated with one or two doses, 2 293 (8%) with three doses, and 11 243 (41%) with four or more doses. For 2 378 cases (8%), the number of doses was unknown.

Outcome

Outcome was known for 31 815 cases, 78% of all cases. Fifteen deaths were reported: 14 in children and one year of age, and one in a 75-year-old person.

Hospitalisation status

Of 29 949 cases with known hospitalisation status, 2 249 (8%) were hospitalised. The majority of those hospitalised were under one year of age.

Discussion

In the majority of Member States, the 2014 notification rate for pertussis was lower than in the epidemic year 2012, but remained higher than in 2010 and 2011. The majority of Member States reported a decrease in the number of cases following the epidemic year of 2012; however, some Member States, e.g. Belgium and the Czech Republic, have reported consistent increases in their annual notification rates over the last few years.

Germany reported data on pertussis to TESSy for the first time in 2014 because the country only recently introduced mandatory nation-wide reporting for pertussis (29 March 2013). Reporting has been mandatory in the five eastern states since 2002, thus under-ascertainment in the western part of the country is higher.

It is important to note that surveillance systems as well as the proportion of laboratory-confirmed cases in EU/EEA Member States are heterogeneous, and direct comparisons between countries should be made with caution.

After a dramatic decline in the reported incidence of pertussis following the introduction of pertussis vaccines into national immunisation programmes some 50 years ago, reported pertussis incidence has increased markedly in recent years in almost all EU/EEA Member States, as well as in other parts of the world [2,3]. This increase has occurred despite sustained high vaccination coverage, highlighting the impact of waning vaccine immunity, while changes in circulating strains may also play a role [3,4]. Improved surveillance is another important factor, such as the increased awareness of the disease among clinicians, improved case ascertainment and improvements in laboratory techniques, for example the use of serology in some countries, which has contributed to the improved diagnosis of the disease in adults and adolescents.

The most affected age group in the majority of countries was infants under one year of age; 83% of these cases are under six months of age, an age group too young to have completed the primary vaccination series. The most severe symptoms of pertussis occur in infants and young children, and death mostly occurs in infants under six months of age [5]. However, in some Member States, adolescents were the most affected age group, with the majority of cases aged 15 years or over, highlighting that pertussis is no longer solely a paediatric disease. The increasing incidence in adolescents and adults is a reason for concern because these age groups are a source of transmission to infants [6,7], especially because mild and asymptomatic cases in adolescents and adults are often not recognised as pertussis [3].

All EU/EEA Member States have added pertussis vaccination to their routine childhood immunisation schedules. These schedules are heterogeneous, but all Member States have at least four doses of pertussis-containing vaccine (primary vaccination with three doses plus at least one booster dose; see http://vaccine-schedule.ecdc.europa.eu/Pages/Schedules.aspx). The United Kingdom started a maternal vaccination programme in October 2012, vaccinating pregnant women between 28 and 38 weeks' gestation. The programme was found to be effective in protecting infants against pertussis infection through both transfer of maternal antibodies and reduced maternal exposure to pertussis [8,9]. Belgium, Ireland, the UK and some regions in Spain have maternal vaccination programmes for pertussis.

Public health conclusions

Pertussis is the least controlled of the vaccine-preventable diseases, and significant challenges remain to curb the recent resurgence of the disease in Europe. A high vaccination coverage must be maintained to ensure direct protection of infants and young children, the two groups which tend to show the most severe symptoms. The recent shortage of pertussis containing vaccines in Europe presents a considerable challenge to maintaining this coverage [10].

Outbreaks in areas of high vaccination coverage highlight that vaccination strategies may need to be revisited and that consideration should be given to adolescent and adult boosters as well as to vaccinations for healthcare workers and pregnant women. Some Member States already have included some of these policies in their national immunisation schedule.

Despite the increasing number of cases reported, it is likely that the burden in Europe is still considerably underestimated [3]. In order to accurately assess changes in the epidemiology over time and optimise disease control, it is important that we continue to improve the surveillance of pertussis, from clinical recognition to laboratory diagnosis. For example, there is a need for further dissemination and implementation of standard approaches to diagnostic confirmation of pertussis across European laboratories [11]. Steps towards standardisation have been taken by the European EuPertStrain and EUPert-LabNet groups, but need to be further promoted in all countries.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annual Epidemiological Report 2014 – vaccine-preventable diseases: http://www.ecdc.europa.eu/en/publications/Publications/AER-2014-VPD-FINAL.pdf

Expert consultation on pertussis. Published on 12 May 2014: http://www.ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=1093

Guidance and protocol for the use of real-time PCR in laboratory diagnosis of human infection with Bordetella pertussis or Bordetella parapertussis: http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=703

Guidance and protocol for the serological diagnosis of human infection with Bordetella pertussis: http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=704

Annex

Table. Pertussis, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Invasive pneumococcal disease

Reporting on 2014 data retrieved from TESSy* on 19 November 2015
Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Invasive pneumococcal disease. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from http://ecdc.europa.eu/en/healthtopics/invasive-pneumococcal-disease/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 17 528 confirmed cases of invasive pneumococcal disease were reported to TESSy.
- The notification rate was 4.8 cases per 100 000 population, lower than in the previous four years.
- Age-specific rates were highest in those aged 65 years and over (13.8 cases per 100 000 population), followed by infants under one year of age (11.3 cases per 100 000 population).
- The 10 most common serotypes were 3, 8, 22F, 19A, 7F, 12F, 1, 9N, 15A and 24F (in order of frequency), accounting for 56% of typed isolates.
- Of all cases <5 years of age, 68% were caused by a serotype not included in any PCV vaccine.
- Among cases aged 65 years and over, 67% were caused by a PPV23 serotype, and 33% were caused by a PCV13 serotype.
- It is essential to continue to monitor circulating serotypes and antimicrobial resistance in Europe in order to assess interventions such as treatment options and the development of new vaccines.

Methods

Click here for a detailed description of the methods used to produce this annual report

In 2010, enhanced surveillance of invasive pneumococcal disease (IPD) was implemented at the European level.

• In 2014, 28 Member States reported data.

• Nine Member States used the EU-2012 case definition, 15 Member States used the EU-2008 case definition, and one Member Stated used the EU-2002 case definition. Three Member States used other case definitions. The 2012 and 2008 case definitions are identical but differ from the 2002 EU case definition in no longer including possible and probable cases and in counting the detection of S. pneumoniae antigen at a normally sterile site as a confirmed case.

• National IPD surveillance systems are heterogeneous. Surveillance systems in Member States and at the European level have also changed over time, including changes in representativeness and reporting procedures.

• Most national surveillance systems are comprehensive, except for Belgium, France, the Netherlands and Spain. Notification rates were not calculated for Belgium, for which population coverage was unknown. All countries – except for Bulgaria and Croatia – report case-based data (Annex 1).

• Serotypes were analysed for Member States that provided serotype data.

• IPD data from France are reported through two different systems: one based on physicians (FR-EPIBAC), the other on laboratories (FR-PNEUMO-NRL). Data reported from FR-EPIBAC are included in all indicators and distributions not related to serotype. Data reported from FR-PNEUMO-NRL are used for all indicators and distributions related to serotype and antimicrobial susceptibility.

Epidemiology

For 2014, 17 528 confirmed cases of IPD were reported by 28 countries. The notification rate was 4.8 cases per 100 000 population, lower than in the previous four years (Table 1). The United Kingdom had the highest number of confirmed cases (4 157), followed by France (3 184) (Figure 1). The highest notification rates were reported in Slovenia, the Netherlands, Denmark and Finland, with 13.4, 13.0, 12.9 and 12.9 confirmed cases per 100 000 population, respectively (Figure 2).

Table 1. Reported confirmed cases of invasive pneumococcal disease cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	325	3.9	158	1.9	234	2.8	350	4.1	Y	C	322	322	3.8	3.5
Belgium	1851	..	1836	..	1738	..	1604	..	N	C	1192	1192	..	..
Bulgaria	26	0.4	37	0.5	19	0.3	17	0.2	Y	A	21	21	0.3	0.3
Croatia	..	..	..	..	18	0.4	16	0.4	Y	A	27	27	0.6	0.2
Cyprus	12	1.5	15	1.8	19	2.2	8	0.9	Y	C	14	14	1.6	1.7
Czech Republic	300	2.9	384	3.7	335	3.2	424	4.0	Y	C	337	337	3.2	3.1
Denmark	960	17.3	924	16.6	882	15.8	842	15.0	Y	C	725	725	12.9	12.1
Estonia	14	1.1	18	1.4	20	1.5	24	1.8	Y	C	12	12	0.9	0.9
Finland	834	15.6	779	14.5	752	13.9	724	13.3	Y	C	703	703	12.9	12.0
France	5117	10.5	5037	10.4	4430	9.0	3687	7.6	74%	C	3184	3184	6.5	6.2
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Greece	38	0.3	41	0.4	43	0.4	40	0.4	Y	C	30	30	0.3	0.3
Hungary	108	1.1	107	1.1	186	1.9	202	2.0	Y	C	150	150	1.5	1.5
Iceland	32	10.1	33	10.4	27	8.4	19	5.9	Y	C	24	24	7.4	8.8
Ireland	304	6.7	357	7.8	350	7.6	347	7.6	Y	C	342	342	7.4	8.3
Italy	854	1.4	713	1.2	814	1.4	977	1.6	Y	C	957	957	1.6	1.4
Latvia	16	0.8	51	2.5	56	2.7	56	2.8	Y	C	51	51	2.5	2.4
Liechtenstein	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lithuania	9	0.3	9	0.3	7	0.2	17	0.6	Y	C	7	6	0.2	0.2
Luxembourg	2	0.4	2	0.4	1	0.2	1	0.2	Y	C	1	1	0.2	0.2
Malta	11	2.7	11	2.7	15	3.6	6	1.4	Y	C	22	22	5.2	4.9
Netherlands	571	13.8	622	14.9	635	15.2	652	15.5	25%	C	550	546	13.0	12.4
Norway	748	15.4	729	14.8	626	12.6	620	12.3	Y	C	569	569	11.1	11.3
Poland	333	0.9	351	0.9	441	1.2	540	1.4	Y	C	705	705	1.9	1.9
Portugal	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Romania	80	0.4	90	0.4	79	0.4	92	0.5	Y	C	62	62	0.3	0.3
Slovakia	18	0.3	57	1.1	49	0.9	84	1.6	Y	C	78	78	1.4	1.5
Slovenia	224	10.9	255	12.4	245	11.9	278	13.5	Y	C	276	276	13.4	12.8
Spain	2212	5.9	2220	5.9	2260	6.0	2026	5.4	80%	C	1856	1856	5.0	4.7
Sweden	1456	15.6	1361	14.5	1387	14.6	1316	13.8	Y	C	1159	1159	12.0	11.0
United Kingdom	5616	9.0	4631	7.3	5208	8.2	5045	7.9	Y	C	4157	4157	6.5	6.3
EU/EEA	**22071**	**6.0**	**20828**	**5.7**	**20876**	**5.7**	**20014**	**5.4**	**.**	**C**	**17533**	**17528**	**4.8**	**4.6**

Source: Country reports. Legend: Y = yes, N = no, C = case based, ' = no report, ASR: age-standardised rate

Figure 1. Reported confirmed cases of invasive pneumococcal disease, EU/EEA, 2014

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

Figure 2. Number of reported confirmed cases of invasive pneumococcal disease per 100 000 population, EU/EEA, 2014

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

Age and gender distribution

In 2014, invasive pneumococcal disease was predominantly found in infants and the elderly, with 13.8 confirmed cases per 100 000 population in adults aged 65 years or older and 11.3 confirmed cases per 100 000 population in children under one year of age (Figure 3). As in previous years, the rates of disease were lowest in people between 5 and 44 years. There was a predominance of cases in males in all age groups, giving an overall male-to-female ratio of 1.2:1.

Figure 3. Reported confirmed cases of invasive pneumococcal disease cases, by age and gender, EU/EEA, 2014

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

Seasonality and trend

The seasonal distribution of IPD cases followed a pattern similar to that of other respiratory diseases. The lowest rates were observed during summer. Case numbers increased rapidly with the onset of autumn and winter, showing a peak in December. This pattern was similar to 2010–2013 (Figures 4 and 5). The number of cases as well as the notification rates of IPD gradually declined over the years (Figure 5), with the lowest values so far in 2014.

Figure 4. Seasonal distribution of reported confirmed cases of invasive pneumococcal disease, EU/EEA, 2014 compared with 2010–2013

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

Figure 5. Trend and number of reported confirmed cases of invasive pneumococcal disease, EU/EEA, 2010–2014

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

Serotype

For 2014, 25 EU/EEA countries reported data on serotype for 12 980 (74%) of 17 528 cases. The 10 most common serotypes were, 3, 8, 22F, 19A, 7F, 12F, 1, 9N, 15A and 24F (ordered by frequency), accounting for 56% of all cases with known serotype (Figure 6). This was similar to the 10 most common serotypes observed in 2012 and 2013, with differences due to a proportional increase in serotypes 9N and 24F, and a proportional decrease in serotypes 14 and 6C.

Among cases aged <1 year, serotype 10A was the most common (8%), followed by 33F (7%). Among children aged 1–4 years, serotypes 24F (11%) and 19A (9%) were the most common (Table 2). Of all cases aged <5 years, 13% were caused by a PCV7 serotype (4, 6A, 6B, 9V, 14, 18C, 19F, 23F), 6% by a PCV10non7 serotype (1, 5, 7F), and 13% by a PCV13non10 serotype (3, 19A). The proportion of cases caused by PCV10non7 and PCV13non7 serotypes has decreased since 2011. In 2014, 68% of cases <5 years of age were caused by a serotype not included in any PCV vaccine, a gradual increase from 38% in 2011 (Figure 7).

Among cases aged 5–64 years, 9% were caused by a PCV7 serotype, 14% by a PCV10non7 serotype, and 15% by a PCV13non10 serotype. The proportion of cases caused by PCV7 and PCV10non7 serotypes has gradually decreased since 2011, when 15% of cases were caused by a PCV7 serotype, and 27% by a PCV10non7 serotype. The proportion of cases caused by PCV13non10 serotypes has remained stable.

Among adults 65 years and over, the most frequent serotypes were 3 (12%) and 22F (8%) (Table 2). Sixty-seven percent were caused by a PPV23 serotype, and 33% were caused by a PCV13 serotype. The proportion caused by a PCV13 serotype has gradually declined since 2011, 50% of cases aged 65 years and over were caused by a PCV13 serotype. Thirty-three percent of cases aged 65 years and over were caused by a serotype not covered by either PCV13 or PPV23.

Serotypes covered by different pneumococcal vaccines:

• 7-valent pneumococcal conjugate vaccine (PCV7): 4, 6B, 9V, 14, 18C, 19F, 23F

• 10-valent pneumococcal conjugate vaccine (PCV10): 4, 6B, 9V, 14, 18C, 19F, 23F, 1, 5, 7F

• 13-valent pneumococcal conjugate vaccine (PCV13): 4, 6B, 9V, 14, 18C, 19F, 23F, 1, 5, 7F, 3, 6A*, 19A (* Although serotype 6A is included in PCV13 and not in PCV7, it is considered to be a PCV7 serotype in the analysis due to documented cross-protection provided by the serotype 6B antigen in PCV7.)

• 23-valent pneumococcal polysaccharide vaccine (PPV23): 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, 33F

Figure 6. Distribution of confirmed cases of invasive pneumococcal disease: most common serotypes in 2014 (n=12 980), 2013 (n=14 811) and 2012 (n=14 845)

* covered by PCV7, PCV10, PCV13 and PPV23
~ covered by PCV10, PCV13 and PPV23
† covered by PCV13 and PPV23
^ covered by PPV23

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

Table 2. Proportion of the five most frequent serotypes among confirmed cases of invasive pneumococcal disease, by age group, 2014 (n= 12 898*)

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Age group (years)	<1	1–4	5–14	15–24	25–44	45–64	≥65
Five most common serotypes by age group (% of all cases)	**10A** (7.9%)	**24F** (11.2%)	**1** (26.8%)	**8** (16.6%)	**8** (13.2%)	**8** (12.1%)	**3** (11.9%)
	33F (7.3%)	**19A** (9.0%)	**7F** (9.4%)	**7F** (11.2%)	**7F** (10.8%)	**3** (10.2%)	**22F** (8.0%)
	19A (6.8%)	**12F** (7.9%)	**12F** (5.5%)	**1** (6.8%)	**3** (7.9%)	**22F** (7.8%)	**8** (7.7%)
	12F (6.5%)	**14** (7.4%)	**23B** (4.8%)	**19A** (6.3%)	**1** (6.7%)	**7F** (6.3%)	**19A** (6.4%)
	24F (5.9%)	**1** (6.3%)	**19A** (4.5%)	**3** (6.3%)	**12F** (6.7%)	**19A** (6.5%)	**7F** (4.3%)

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

* Number of cases for which information on serotype and age was available. Number of cases for which serotype information was available by age group: <1 year: n= 355; 1-4 years: n= 599; 5-14 years: n= 308; 15-24 years: n= 205; 25-44 years: n= 1 354; 45-64 years: n= 3 458; >65 years: n= 6 675.

Figure 7. Invasive pneumococcal disease, reported, confirmed cases aged <5 years: serotype distribution by PCV vaccine type, 2011–2014 (n= 4 783)

* Although serotype 6A is included in PCV13 and not in PCV7, it is considered to be a PCV7 serotype in the analysis due to documented cross-protection provided by the serotype 6B antigen in PCV7. PCV7 serotypes: 4, 6A, 6B, 9V, 14, 18C, 19F, 23F; PCV10non7 serotypes: 1, 5, 7F; PCV13non10 serotypes: 3, 19A; non-PCV serotypes: all remaining serotypes.

Antimicrobial susceptibility

The prevalence of non-susceptibility (combined intermediate and resistant categories) to penicillin increased from 8% in 2012 to 11% in 2014. In 2014, non-susceptibility to erythromycin was 14% after decreasing from 17% in 2012. Cefotaxime/ceftriaxone non-susceptibility increased from 2% in 2012 to 6% in 2014 (Figure 9). In 2014, the prevalence of non-susceptibility varied between countries, with the highest percentages of non-susceptibility reported by Italy (erythromycin: 28.0%), Poland (penicillin: 28.3%), and Spain (cefotaxime/ceftriaxone: 12.5%).

Figure 8. Susceptibility of confirmed cases of invasive pneumococcal disease to cefotaxime/ceftriaxone, penicillin and erythromycin, 2012–2014

Sources:

For penicillin, country reports from Austria, Belgium, Cyprus (2012), Denmark, Estonia, Finland, France, Hungary, Iceland (2012, 2014), Ireland, Italy, Latvia (2013, 2014), Lithuania (2012, 2013), Norway, Poland, Romania (2013), Slovakia, Slovenia, Spain, the United Kingdom (2012, 2013, 2014). Total number of cases – 2012: n=12 226; 2013: n=11 493; 2014: n=9 283.

For erythromycin, country reports from Austria, Cyprus (2013, 2014), Denmark, Estonia, Finland, France, Hungary, Iceland (2012, 2014), Ireland, Italy, Latvia (2013, 2014), Lithuania (2012, 2013), Norway, Poland, Romania (2013), Slovakia, Slovenia, Spain, the United Kingdom (2012, 2013, 2014). Total number of cases – 2012: n=9 685; 2013: n=9 202; 2014: n=7 548.

For cefotaxime/ceftriaxone, country reports from Austria (2012, 2013), Cyprus (2012), Denmark, Estonia, Finland (2012, 2014), France (2012), Hungary, Iceland (2012, 2014), Ireland, Latvia (2013, 2014), Lithuania (2012, 2013), Norway, Poland, Romania (2013), Slovakia, Slovenia, Spain, the United Kingdom (2012, 2013, 2014). Total number of cases – 2012: n=4 419; 2013: n=4 715; 2014: n=4 592.

Note: SIR values (susceptible, intermediate, and resistant) are displayed as interpreted by the reporting countries. 'Intermediate' and 'resistant' were categorised as 'non-susceptible'.

Clinical presentation

The clinical presentation was known for 10 353 (59%) of all cases. Bacteraemia was reported in 5 943 cases (57%), bacteraemia and pneumonia in 2 417 cases (23%), meningitis in 1 456 cases (14%), and a further 537 cases (5%) had other clinical presentations. Bacteraemia was the most common clinical presentation in all age groups and with the 15 most common serotypes, except for serotypes 14 and 1, which were most commonly associated with bacteraemia and pneumonia.

Outcome

The outcome was known for 4 772 (27%) of all cases. Among cases with known outcome, 713 (15%) were reported as fatal. However, due to the poor completeness of this variable, these results must be interpreted with caution. The true case fatality is expected to be considerably lower.

Discussion

In 2014, the notification rate of confirmed IPD was lower than in previous years and varied by country, ranging from 0.2 to 13.4 cases per 100 000 population. The variation in notification rates between countries may be due to better case ascertainment and the implementation of enhanced surveillance systems in some countries. The elderly and infants continue to be the most affected age groups.

In all age groups, the proportion of cases caused by PCV serotypes decreased, and the majority of cases were caused by non-PCV serotypes. PCV7 was first licensed in 2001 for use in infants and young children, and EU/EEA Member States began introducing the vaccine into their routine child immunisation schedules in 2006. In 2009, the higher valency PCV10 and PCV13 vaccines were licensed and have progressively replaced PCV7. To date, 25 Member States have introduced one of the conjugate vaccines into their routine national childhood immunisation programme [1].

The introduction of pneumococcal conjugate vaccines has proved to be very effective in reducing the incidence of IPD [2]. Moreover, the vaccination of infants and young children has resulted in herd protection by reducing nasopharyngeal carriage and transmission of the bacterium, contributing to a decrease in morbidity and mortality among the older age groups [3-6]. Over time, serotype replacement has gradually reduced the effectiveness of PCV7, as the rates of carriage and disease caused by non-vaccine serotypes have increased [7]. There is evidence that such increases in non-vaccine serotypes are continuing, following the introduction of PCV10 and PCV13 [5, 6]. In Europe in 2014, serotypes four and two – which belong to the five most common serotypes in infants and children aged 1–4 years – are not included in any of the currently licensed pneumococcal conjugate vaccines. Both serotypes could be potential targets for future higher valency vaccines.

Among the elderly, the majority of cases continue to be caused by PPV23 serotypes, with a third of all cases caused by PCV13 serotypes. In 2011, PCV13 was approved for use in adults aged 50 years and over. Studies have shown that PCV13 vaccination in the elderly can induce an immune response against vaccine serotypes that is non-inferior or better than PPV23. The vaccine is safe and effective in preventing non-invasive pneumococcal pneumonia and invasive pneumococcal disease [8]. However, decreases in PCV13 serotypes and increases in non-PCV13 serotypes in the elderly as an indirect effect of routine childhood vaccination may decrease the potential benefit of elderly PCV13 vaccination [9]. Further monitoring of IPD serotype trends in the elderly and post-marketing impact studies in adults are essential. Twenty Member States offer different vaccines for persons 50 years and over, and/or for risk-groups in certain age groups. Fifteen Member States offer PPV23 and nine offer PCV13 vaccination for the elderly [1].

Public health conclusions

The decision to introduce a vaccine to the routine national immunisation programme depends on context-specific factors in each country, such as the disease and serotype burden, cost-effectiveness, and feasibility. It is essential to continue to monitor circulating serotypes and antimicrobial resistance in Europe in order to assess interventions such as treatment options and the development of new vaccines.

In August 2012, ECDC has started funding SpID-net (Streptococcus pneumoniae Invasive Disease network), a project which aims to establish active surveillance of IPD in the EU/EEA in order to monitor changes in the epidemiology of IPD, estimate vaccine effectiveness of PCV vaccines, and evaluate the impact of PCV vaccination programmes. The project has study sites in ten Member States and covers around 20% of the total EU/EEA population.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

ECDC annual epidemiological report, 2014: http://ecdc.europa.eu/en/publications/Publications/AER-VPD-IBD-2014.pdf

ECDC enhanced surveillance report, 2012: http://ecdc.europa.eu/en/publications/Publications/Surveillance%20of%20IBD%20in%20Europe%202012.pdf

ECDC External quality assurance scheme for Streptococcus pneumoniae, 2012: http://ecdc.europa.eu/en/publications/Publications/streptococcus-pneumoniae-EQA-2012.pdf

ECDC surveillance report on invasive bacterial diseases in Europe 2011: http://ecdc.europa.eu/en/publications/Publications/invasive-bacterial-diseases-surveillance-2011.pdf

ECDC surveillance report on invasive pneumococcal diseases in Europe 2010: http://ecdc.europa.eu/en/publications/Publications/invasive-pneumococcal-disease-surveillance-2010.pdf

Annex

Table. Invasive pneumococcal disease, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Poliomyelitis

Reporting on 2014 data retrieved from TESSy* on 18 December 2015
Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Poliomyelitis. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/poliomyelitis/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- The WHO European Region was declared polio-free in 2002. There was neither wild-type nor vaccine-type transmission in the WHO European Region in 2014, but the risk of importation and subsequent transmission remain high in some countries.
- The most recent polio outbreaks in what today constitutes the EU/EEA were in 2001 (three polio cases among Roma children in Bulgaria [1]) and 1992 (outbreak in the Netherlands in a religious community opposed to vaccination [2]).
- Inactivated poliovirus vaccines are used in all EU/EEA countries, except Poland where live oral poliovirus vaccine (OPV) is still used for the fourth dose. Wild-type polioviruses can cause natural disease, while live attenuated polio vaccine viruses may cause vaccine-associated polio paralysis (VAPP), although the risk is very low.
- In 2014, poliomyelitis remained endemic in three countries – Nigeria, Afghanistan and Pakistan [3].
- Imported wild-type and vaccine-type polioviruses still remain a threat to unvaccinated people in the EU/EEA. Maintaining high coverage in all population groups and continued clinical and/or environmental surveillance remain the most important tools for keeping Europe polio-free.

Methods

Click here for a detailed description of the methods used to produce this annual report

• In 2014, no cases of poliomyelitis disease were reported in any of the 30 reporting EU/EEA countries. All countries reported zero cases.

• 25 out of 30 Member States report data on polio in accordance with the 2008 or 2012 EU case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council).

• All Member States report data from comprehensive, passive surveillance systems with national coverage. For a summary of surveillance system characteristics, please refer to Annex 1.

• There was no report from Liechtenstein.

Epidemiology

Member States of the WHO European Region submit reports on the status of their national polio eradication programme to WHO on an annual basis [4]. The following risk factors for reintroduction and transmission after importation are assessed: health system, routine immunisation coverage, presence of high-risk groups or pockets of susceptible individuals, surveillance indicators, and existence of a preparedness plan.

On 9–10 June 2015, The European Regional Certification Committee for Poliomyelitis Eradication (RCC) reviewed the reports on the national polio eradication programme of all countries in the WHO European Region [5].

The RCC concluded, based on available evidence, that there was no wild poliovirus or vaccine-derived poliovirus transmission in the WHO European Region in 2014, but the risk of importation and subsequent transmission remains high in some countries. The RCC also identified issues that threatened the future polio-free status of the Region and proposed actions to be taken by Member States and the Regional Office for reducing the risk of polioviruses circulating in the Region.

While three Member States (Bosnia and Herzegovina, Romania and Ukraine) were considered to be at high risk of establishing substantial poliovirus transmission in the event of reintroduction, the current situation in Ukraine is of particular concern. If wild poliovirus were to be introduced into Ukraine, the RCC has no doubt that the consequence would be a significant disease outbreak, threatening the polio-free status of the European Region and presenting a significant setback to the Global Polio Eradication Initiative.

Threats description up to 15 December 2015

On 5 May 2014 [6], WHO declared the international spread of wild poliovirus in 2014 a Public Health Emergency of International Concern (PHEIC) following the confirmed circulation of wild poliovirus in several countries and the documented exportation of wild poliovirus to other countries. On 26 November 2015 [7], the Temporary Recommendations in relation to PHEIC were extended for another three months. WHO recently declared wild poliovirus type 2 eradicated worldwide.

Wild poliovirus transmission has been at the lowest level ever, with fewer cases reported from fewer countries than ever before. As of 15 December 2015, wild poliovirus cases were reported from only two countries in 2015: Pakistan (49 cases) and Afghanistan (17 cases), compared with 322 cases from nine countries during the same period in 2014.

Twenty-three cases of circulating vaccine-derived poliovirus (cVDPV) were reported to WHO in 2015, compared with 48 for the same period in 2014. The cases this year are from Madagascar (10 cases), Laos (5), Ukraine (2), Pakistan (2), Nigeria (1), Myanmar/Burma (2) and Guinea (1).

On 28 August 2015, two cases of paralytic poliomyelitis caused by circulating vaccine-derived poliovirus type 1 (cVDPV1) were confirmed in Ukraine [8]. The genetic similarity between the isolates indicates active transmission of cVDPV1. Both cases were from the Zakarpatskaya oblast [region] in south-western Ukraine, which borders Romania, Hungary, Slovakia and Poland. Supplementary immunisation activities were initiated in response to the outbreak.

Discussion

Europe has remained polio-free since 2002. The latest assessment by the European RCC of Poliomyelitis Eradication concludes that there was no wild poliovirus or vaccine-derived poliovirus transmission in the WHO European Region in 2014, but the risk of importation and subsequent transmission remains high in some countries.

Polio remains endemic in two countries: Afghanistan and Pakistan. It is of importance to note that there were strong efforts by countries in Africa to eradicate polio: no cases of wild poliovirus have been reported in Africa for more than twelve months, and Nigeria interrupted the endemic transmission of wild poliovirus.

The risk of importation to Europe exists as long as there is polio circulating in the world. The importation of polioviruses through faecal excretion remains a potential threat. In order to avoid cases of polio due to vaccine-associated paralytic polio (VAPP) and circulating vaccine-derived polioviruses (cVDPVs), the new endgame strategy for polio eradication includes sequential oral polio vaccine withdrawal, starting with Sabin type 2 strains [9].

The September 2015 meeting of the Strategic Advisory Group of Experts on immunisation (SAGE) confirmed the globally coordinated withdrawal of the type 2 component in OPV – also referred to as the 'tOPV to bOPV switch' – for April 2016 [10].

Public health conclusions

The risk of transmission following importation remains high in some countries, because transmission after reintroduction may occur if pockets of susceptible people exist. Vaccination coverage levels in the EU/EEA can be considered satisfactory as a whole (>90% for three doses of either IPV or OPV) and can explain the absence of WPV circulation in the region so far; however, vigilance needs to remain high. Unvaccinated pockets should be identified, and targeted actions to increase vaccination coverage in these populations should to be immediately addressed. High immunisation coverage in all population groups is essential and will also provide herd immunity to still susceptible individuals.

Maintaining high vaccine coverage and continued clinical, enterovirus and environmental surveillance remain the most important tools for keeping Europe polio-free.

Additional information

ECDC Surveillance Atlas of Infectious Diseases

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Annex

Table. Poliomyelitis, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Q fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Q fever. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/Qfever/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- 822 cases of Q fever were reported to TESSy in 2014; 782 of these cases were confirmed (95.1%).
- The notification rate in 2014 was 0.18 cases per 100 000 population.
- The frequency of reported cases of Q fever usually increases with age and is highest among males.
- Between 2010 and 2014, the highest number of cases was seen in 2010. Between 2010 and 2014, the epidemiological situation of Q fever in humans appeared to be unchanged.
- Cases are reported all year round, with an increase between April and July, and a peak in May.
- Small outbreaks still occur in Europe where areas with affected sheep and goat herds are considered at risk.

Methods

Click here for a detailed description of the methods used to produce this annual report

- In 2014, 27 EU /EEA countries provided information on Q fever in humans. Eight countries (the Czech Republic, Estonia, Finland, Iceland, Ireland, Lithuania, Luxembourg and Malta) reported no human cases.

- Twenty-two countries used the EU case definition except France, Germany and Romania which use another case definition. Belgium and Finland did not specify their case definition or it was unknown.

- In Spain, the surveillance system is entirely laboratory based and covers an estimated 30% of the population.

- Reporting is compulsory in 23 countries and voluntary in four (Belgium, France, Spain and the United Kingdom). A sentinel system is in place in Belgium and Spain. Disease surveillance is mostly passive except in Belgium, the Czech Republic and Slovakia (Annex). Data reporting is case based (except in Bulgaria and Croatia) and at the national level (except in Spain).

Epidemiology

Twenty-seven EU/EEA countries provided information on Q fever in 2014. A total of 822 cases was reported to TESSy, 782 of which were confirmed (95.1%). Most of the confirmed cases were males (63.5%). Cases occurred all year round, with an increase observed between April and July, and a peak in May. In the period 2010–2014, the highest number of cases was observed in 2010. From 2011 onwards, the Q fever trend remained stable.

The notification rate was 0.18 cases per 100 000 population, slightly higher than in 2013 (0.15 cases per 100 000). In the period 2010–2014, the highest notification rate was seen in 2010, with 0.34 cases per 100 000 population. From 2011 to 2014, the notification rate was varying between 0.15 and 0.19 cases per 100 000 population. Eight countries reported zero cases in 2014 (as in 2013), and seven countries reported between one to three cases. Most of the cases were reported from Germany (262, 90.1% of which were confirmed) and from France (209, all confirmed).

Table 1: Reported Q fever cases: number and rate per 100 000 population, EU/EEA, 2010–2014

Download Excel sheet

Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Confirmed cases	Rate	ASR*
Austria	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Belgium	30	0.3	6	0.1	18	0.2	5	0.0	Y	C	16	4	0.0	-
Bulgaria	14	0.2	12	0.2	29	0.4	23	0.3	Y	A	17	15	0.2	-
Croatia	.	.	.	.	43	1.0	0	0.0	Y	A	21	21	0.5	0.5
Cyprus	4	0.5	5	0.6	4	0.5	3	0.3	Y	C	1	1	0.1	0.1
Czech Republic	0	0.0	1	0.0	1	0.0	0	0.0	Y	C	0	0	0.0	0.0
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Finland	5	0.1	4	0.1	0	0.0	5	0.1	Y	C	0	0	0.0	0.0
France	286	0.4	228	0.4	168	0.3	158	0.2	Y	C	209	209	0.3	0.3
Germany	326	0.4	285	0.3	198	0.2	114	0.1	Y	C	262	238	0.3	0.3
Greece	1	0.0	3	0.0	11	0.1	11	0.1	Y	C	15	15	0.1	0.1
Hungary	68	0.7	36	0.4	36	0.4	135	1.4	Y	C	59	59	0.6	0.6
Iceland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Ireland	9	0.2	4	0.1	5	0.1	0	0.0	Y	C	0	0	0.0	0.0
Italy	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Latvia	2	0.1	1	0.0	1	0.0	1	0.0	Y	C	3	3	0.1	0.2
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Malta	0	0.0	0	0.0	0	0.0	2	0.5	Y	C	0	0	0.0	0.0
Netherlands	504	3.0	80	0.5	63	0.4	20	0.1	Y	C	26	26	0.2	0.2
Norway	0	0.0	0	0.0	0	0.0	4	0.1	Y	C	1	1	0.0	0.0
Poland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	1	1	0.0	0.0
Portugal	13	0.1	5	0.0	26	0.2	21	0.2	Y	C	27	25	0.2	0.2
Romania	7	0.0	6	0.0	16	0.1	24	0.1	Y	C	21	21	0.1	0.1
Slovakia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	1	1	0.0	0.0
Slovenia	1	0.0	0	0.0	1	0.0	1	0.0	Y	C	3	3	0.1	0.2
Spain	69	-	33	-	58	-	75	-	N	C	77	77	-	-
Sweden	11	0.1	5	0.1	2	0.0	3	0.0	Y	C	2	2	0.0	0.0
United Kingdom	30	0.0	43	0.1	12	0.0	46	0.1	Y	C	60	60	0.1	0.1
EU/EEA	**1380**	**0.3**	**757**	**0.2**	**692**	**0.2**	**651**	**0.1**	**.**	**C**	**822**	**782**	**0.2**	**0.2**

Source: Country reports. Legend: Y = yes, N = no, C = case based, ' = no report, ASR: age-standardised rate

The highest numbers of confirmed cases were reported by Germany and France (238 and 209, respectively) (Figure 1). France and Germany accounted for most of the confirmed cases reported in the last four years (2011–2014). The highest notification rate (0.60 cases per 100 000 population) was observed in Hungary, followed by Croatia (0.49 cases).

Figure 1. Number of confirmed Q fever cases, EU/EEA, 2014

Figure 2. Confirmed Q fever cases per 100 000 population, EU/EEA, 2014

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

Age and gender distribution

In 2014, the rate of confirmed human Q fever cases was higher among men than women (0.23 cases compared to 0.13 cases per 100 000); the male-to-female ratio was 1.8:1. The highest notification rate was among males in the age group between 45 and 64 years (0.32 cases per 100 000), followed by those over 65 years of age (0.30 per 100 000). Among females, the highest notification rate was in the 45–64-year-old age group (0.18 cases per 100 000). Children under 15 years of age accounted for 4.0% of all cases (Figure 3).

Figure 3. Confirmed Q fever cases per 100 000 population, by age and gender, EU/EEA, 2014

Source: Country reports from Belgium, Croatia, Cyprus, the Czech Republic, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Seasonality

Cases occurred all year round, with an increase from April to July and a peak in May, probably associated with the start of the kidding (goats) and lambing (sheep) seasons. The curve for 2014 followed these general characteristics, but remained slightly below the average curve during the first six months of the year.

Figure 4. Seasonal distribution of confirmed Q fever cases, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Belgium, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

Enhanced surveillance in 2014

Travel-related cases

The large majority of Q fever cases in the EU were domestically acquired. Only Germany, Greece, Hungary, the Netherlands, Norway, Poland, Sweden and the United Kingdom reported travel-associated cases. The four cases in Poland, Sweden and Norway were travel related. Of the 36 travel-associated cases reported in the EU/EEA, 14 were acquired in other EU countries, including four in Spain and five in Turkey.

Case fatality rate

In 2014, Hungary reported one death due to Q fever. This resulted in an EU case fatality rate of 0.26% among the 380 confirmed cases with known outcome (51.2% of confirmed cases from countries with case-based reporting).

Trend

Between 2010 and 2014, the highest number of cases was observed in 2010. Starting in 2011, the Q fever trend in humans remained stable (Figure 5).

Figure 5: Trend and number of confirmed Q fever cases, EU/EEA, 2010–2014

Source: Country reports from Belgium, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

Discussion

Following a high number of cases in 2010, the Q fever situation returned to a stable state in 2011. However, trends are different across countries (see the online ECDC Surveillance Atlas of Infectious Diseases for country-specific trends). The high number of cases notified in 2010 was linked to a large outbreak in the Netherlands with more than 4 000 cases between 2007 and 2010 [1]. In spring and summer of 2013, an outbreak with 70 confirmed human cases was detected in southern Hungary [2]. France and Germany accounted for most of the confirmed cases reported in the last four years.

Q fever, or 'query fever', is a zoonotic disease caused by the bacterium Coxiella burnetii. Cattle, sheep and goats are the primary domestic animal reservoirs, and the bacteria are excreted in high numbers in birth products, milk, urine and faeces. The bacteria can survive for long periods in the environment and are very resistant to physical and chemical stress. Humans are considered accidental hosts. They are most often infected when inhaling contaminated dust. Infection by ingestion of contaminated milk is also possible. Six human cases of Q fever were associated with a so-called 'fresh cell therapy' performed in Germany in May 2014. An additional case was reported in Germany linked to the same practice in October 2014. These cases reconfirm the risk of infectious disease transmission through xenotransplantation [3].

Public health conclusions

Good hygiene practices in premises dealing with animals – particularly with sheep, cattle and goats – will help prevent transmission of Q fever. As the disease can be transmitted to humans through contaminated milk, pasteurisation of milk and milk products will help prevent infection. Data on Q fever surveillance in animals in the European region are available in an ECDC/EFSA report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks [4].

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annex

Table. Q fever, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Rabies

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Rabies. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/rabies/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- Three imported cases of rabies were reported in 2014.
- Every year, a small number of human cases is reported in Europe, either travel related or autochthonous.

Methods

Click here for a detailed description of the methods used to produce this annual report

• Thirty EU/EEA countries reported data in TESSy in 2014.

• Twenty-four countries use the EU case definition. An alternative case definition was used by Denmark, Germany and Italy. Belgium, Finland and France did not specify their case definitions.

• Reporting is compulsory in 28 countries (not in Belgium and the United Kingdom). Surveillance is comprehensive in all reporting countries and passive in 27 countries except the Czech Republic, Slovakia and United Kingdom. Reporting is case based in 29 countries (except in Bulgaria) and conducted at the national level. Cases are mostly reported by physicians (27 countries) (Annex).

Epidemiology

Very few cases of rabies in humans are reported in the EU, and most EU Member States have not had autochthonous cases for decades. In 2011 and 2013 only one human case of rabies was reported in Europe. In 2012, two human cases were reported among European citizens. In 2014, three cases of rabies in people who travelled to a non-EU/EEA country endemic for rabies were reported: a 46-year-old woman from Spain bitten by a dog in Morocco, a 57-year-old man from France infected by a canine strain of rabies virus in Mali (Africa), and a 35-year-old Dutch woman bitten by a dog in India [1]. The case in France resulted in 158 healthcare workers potentially exposed to rabies. In 2013, one travel-associated case of rabies was reported from the Netherlands. The patient was a 51-year-old man, exposed to an unknown source in Haiti.

Discussion

Every year, human rabies claims more than 50 000 lives worldwide. It is a rare and vaccine-preventable zoonosis in Europe, but the disease is invariably fatal in infected humans once the first clinical symptoms have appeared.

Rabies is a neurological disease caused by a virus of the genus Lyssavirus, Rhabdoviridae family. The virus can infect all warm-blooded animals and is transmitted through contact with saliva from infected animals via bites, in Europe typically from foxes and stray dogs but also raccoon dogs for example. Bats are also carriers of other rhaboviruses such as EBLV-1 (European Bat Lyssavirus) or EBLV-2, and can transmit rabies to other mammals including humans.

In many places in Asia and Africa, stray dogs are a main source of infections for humans. People visiting these areas should be aware of this. Illegal importation of animals is a risk for rabies. Illegally imported dogs infected with rabies virus were reported in France (2012 and 2015), Spain (2013) and the Netherlands (2013) [2] [3]. The re-emergence of rabies in northern Italy in 2008–2011 and in Greece in 2012–2013 shows the importance of maintaining high awareness levels [4]. Data on rabies surveillance in animals in Europe are available online from the WHO Collaboration Centre for Rabies Surveillance and Research [5] and from the joint ECDC/EFSA report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks [6].

Public health conclusions

It remains important to inform the public about the risk of contracting rabies if bitten by animals (especially dogs) while travelling to rabies-endemic countries or in Member States which have not eradicated the disease in their animal population [7]. Preventive measures include vaccination of domestic carnivores and oral vaccination of wildlife.

Timely prophylaxis in case of exposure to a potentially infected animal is of utmost importance, and knowledge of the epidemiological situation is vital to make decisions with regard to appropriate post-exposure measures [8]. Treatment consists of local wound care, vaccination and, if indicated, passive immunisation with immunoglobulin. To be effective, treatment has to occur as soon as possible after exposure. Every year, more than 15 million people worldwide receive a post-bite vaccination to prevent the disease. This is estimated to prevent hundreds of thousands of rabies deaths annually.

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Additional information

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World Health Organization. Global distribution of risk to humans of contracting rabies. Geneva: World Health Organization, 2013. http://www.who.int/rabies/Global_distribution_risk_humans_contracting_rabies_2013.png

Annex

Table. Rabies, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Rift Valley fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Rift Valley fever. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/rift_valley_fever/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- There were no cases of Rift Valley fever reported in EU/EEA countries in 2014.

Methods

Click here for a detailed description of the methods used to produce this annual report

- Data were obtained from 23 EU/EEA countries.
- The EU case definition was used by 14 countries; four countries used an alternative case definition, and five countries did not provide information on case definitions.
- Surveillance is compulsory in 19 EU/EEA countries, voluntary in two (Ireland and the United Kingdom), and mostly passive (Annex 1). Data reporting is case based and done at the national level.

Epidemiology

No cases of Rift Valley fever were reported in 2014 in the EU. Between 2010 and 2014, three cases were reported in the EU. Two cases were reported in 2012 (one from France and one from the United Kingdom) who were probably infected in Comoros and Egypt, respectively. In 2013, one case – probably infected in Uganda – was reported by the United Kingdom.

Discussion

Rift Valley fever is an acute viral febrile haemorrhagic disease that affects primarily ruminants in Africa and in the Arabian Peninsula (such as cattle, buffalo, sheep, goats and camels). The disease is caused by a virus from the Phlebovirus genus of the Bunyaviridae family.

Rift Valley fever occurs in humans in many sub-Saharan countries, in Madagascar, Saudi Arabia and Yemen. Humans may become infected by mosquito bites and through direct or indirect contact with the blood or organs of infected animals. While most human cases are relatively mild (influenza-like illness), a small percentage of patients develops a severe form of the disease, with haemorrhagic manifestations, hepatitis and neurological disorders.

Rift Valley fever is notifiable to the World Organisation for Animal Health [1]. Animal movement may contribute to viral spread, threatening countries in the Mediterranean basin where competent vectors are present [2].

In 2014, Botswana reported an outbreak in cattle in the northern part of the country (Chobe) in July and another outbreak in August in goats in the southern region (Gaborone) [3]. In 2013, Mauritania and Senegal reported epizootics in ruminants including wild fauna [4][5].

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Table. Rift Valley fever, surveillance systems overview, 2014

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Severe acute respiratory syndrome (SARS)

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Severe acute respiratory syndrome. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/SARS/Pages/Annual-epidemiological-report-2016.aspx

Key facts

- Knowledge about the epidemiology and ecology of SARS coronavirus infection remains presently incomplete and the risk of re-emergence is unpredictable.
- The rapid spread of SARS worldwide showed the need to maintain surveillance despite the disease's absence since 2003.
- The emergence in 2012 of a novel coronavirus in humans in the Middle East associated with the early detection of imported cases to Europe showed that SARS and related viruses need to be globally monitored and response capacities need to be maintained.

Methods

Click here for a detailed description of the methods used to produce this annual report

Epidemiology

Severe acute respiratory syndrome (SARS) is a respiratory disease in humans caused by the SARS coronavirus (SARS-CoV). In 2002–03 an epidemic originating in Foshan, Guangdong Province, China, spread globally, with over 8 000 known cases reported in eight months from 33 countries on five continents, of which 21% were healthcare workers. The case-fatality rate was about 10%. The last known community case occurred in the USA in July 2003, but another localised SARS-related crossover from animals occurred in 2004 [1].

Although surveillance has been ongoing, there were no reports of SARS virus infection in humans from 29 EU and EEA countries (no reports from Liechtenstein) in 2014; nor have there been any reports of SARS virus infection in humans worldwide since 2003.

Discussion

SARS is believed to have been an animal virus that recently crossed the species barrier to infect humans. Bats have been identified as potential reservoir hosts of coronaviruses associated with SARS [2]. The SARS outbreak illustrated the importance of sensitive detection tools in the preparedness and response to emerging health threats. Other key preparedness activities include advance planning, communication, education and training, and stockpiling supplies of personal protective equipment [3-5].

The emergence in 2012 of human cases of an acute respiratory illness of unknown origin in several countries in the Middle East (Jordan, Qatar and Saudi Arabia with importation of several cases to Europe) revealed the importance of close monitoring, collaboration between laboratories (to promptly set up laboratory capacity for detection and characterisation of emerging pathogens), and appropriate protective biosafety measures using lessons learnt from the past SARS outbreak [6-9].

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Smallpox

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Smallpox. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/smallpox/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- There were no reports of smallpox or potential smallpox in EU/EEA or other countries in 2014.
- Smallpox was declared eradicated in 1980.

Methods

Click here for a detailed description of the methods used to produce this annual report

- Data were obtained from 27 EU/EEA countries; Croatia, Portugal and Liechtenstein did not submit data.
- The EU case definition was used by 21 countries; three countries used an alternative case definition, and three countries did not specify the case definition.
- Surveillance is compulsory in 26 EU/EEA countries; surveillance systems are comprehensive and mostly passive (Annex).

Epidemiology

There were no reports of smallpox or potential smallpox in EU/EEA countries or other countries in 2014.

Discussion

Smallpox is a systemic infectious disease, unique to humans, caused by either of two orthopoxvirus variants, Variola major and Variola minor. In 1980, the World Health Organization declared smallpox eradicated.

Mass smallpox vaccination campaigns have ceased after eradication. Consequently, the population that is immunologically naive to orthopoxviruses has increased significantly, which makes it possible to consider smallpox viruses for use as a biological weapon. Legitimately, the virus exists only in two WHO reference laboratories. Any new case of smallpox would have to be the result of accidental or deliberate release. On 1 July 2014, the US National Institutes of Health (NIH) notified an episode where employees discovered vials labeled 'variola' in an unused portion of a storage room in a Food and Drug Administration laboratory located on the NIH Bethesda campus (Maryland, USA). There is no evidence that any of the vials were breached; onsite biosafety personnel did not identify any infectious exposure risk to lab workers or the public [1].

The disease clinically and immunologically most similar to smallpox is monkeypox, a zoonosis endemic to moist forested regions in West and Central Africa. Smallpox vaccine provided protection against both infections. The observation of monkeypox cases in humans in the Democratic Republic of Congo over several years prompts the question of whether the cessation of smallpox vaccination drives this phenomenon [2,3].

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annex

Table. Smallpox, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Surgical site infections

Reporting on 2013 and 2014 data retrieved from TESSy* on 6 April 2016

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Surgical site infections. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/surgical-site-infections/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- Surgical site infections (SSIs) are among the most common healthcare-associated infections (HAI) [1]. They are associated with longer post-operative hospital stays, additional surgical procedures, treatment in intensive care units and higher mortality [2].
- In 2013–2014, 15 EU Member States and one EEA country reported SSIs for seven types of surgical procedure to ECDC.
- During this period, 18 364 SSIs were reported from a total of 967 191 surgical procedures.
- The percentage of SSIs per 100 surgical procedures varied from 0.6% to 9.5% depending on the type of procedure.
- The incidence density of in-hospital SSIs per 1000 post-operative patient-days varied from 0.2 to 5.7 depending on the type of surgical procedure.
- From 2011 to 2014, a significantly increasing trend was observed for the yearly percentage of SSIs in cholecystectomy operations.
- For coronary artery bypass grafts and knee prosthesis surgery, a significantly decreasing trend for both the yearly percentage of SSIs and the incidence density of SSIs was observed during 2011–2014.

Methods

Click here for a detailed description of the methods used to produce this annual report

SSI surveillance data for 2013–2014 were reported to ECDC by 16 countries (15 EU Member States and one EEA country). This report is based on data extracted on 6 April 2016.

Data on SSIs following surgical procedures that took place in 2013–2014 were collected in hospitals participating in national or regional surveillance of SSIs across Europe. The surveillance protocol allowed these hospitals to opt for patient-based or unit-based reporting [3]. SSI cases were classified according to the modified 2012 EU case definitions [4].

The SSI surveillance protocol includes seven types of surgical procedures: coronary artery bypass graft (CABG), cholecystectomy (CHOL), colon surgery (COLO), caesarean section (CSEC), hip prosthesis (HPRO), knee prosthesis (KPRO) and laminectomy (LAM). Only SSIs detected within a defined follow-up period were included in the analysis. For superficial SSIs, the follow-up period was 30 days. For deep or organ/space infections following orthopaedic operations with an implant in place (HPRO/KPRO), the follow-up period used in the analysis was 90 days (replacing the previous one-year period), reflecting the upcoming changes in the surveillance protocol [4,5,6].

For all patients with an SSI, basic demographics, infection characteristics and in-hospital outcome were collected. In the patient-based surveillance option, these data were collected from all surgical patients. Furthermore, information on each surgical procedure was collected, including whether the operation was urgent (i.e. not planned at least 24 hours in advance). The US National Healthcare Safety Network (NHSN) risk index, which is based on the presence of three major risk factors (duration of the operation, wound contamination class and the American Society of Anesthesiologists (ASA) physical status classification), was used to assign all surgical patients to one of four categories (0 to 3) [7,8]. In this analysis, categories 2 and 3 were combined because of the low number of operations in these categories.

ECDC checked the reported SSI surveillance data for missing, unknown or discordant values and fed the results back to each country, which then had the option to correct the data.

For each type of surgical procedure under surveillance, two main indicators were calculated; the date of infection onset was used to determine if the SSIs were diagnosed during hospital stay:

• The percentage of SSIs per 100 operations: an indicator which includes both SSIs diagnosed during hospital stay and after discharge from the hospital (detected at hospital readmission or by post-discharge surveillance).

• The incidence density of in-hospital SSIs per 1 000 post-operative patient-days: an indicator which only includes SSIs diagnosed during hospital stay in patients with a known discharge date from the hospital.

For the patient-based data, both indicators were also stratified by NHSN risk index categories.

For each type of surgical procedure, trends in the percentage of SSIs and in the incidence density of SSIs between 2011 and 2014 were analysed by univariable Poisson regression. Given the dichotomous outcome, a robust sandwich variance estimator was used to correct the standard errors of the Poisson regression coefficients. Only countries that provided data using the same surveillance option (patient-based or unit-based) for at least three years were included in the trend analysis.

Epidemiology

Sixteen countries participated in the surveillance of SSIs. Thirteen countries and most of the United Kingdom (England, Northern Ireland and Wales) reported patient-based data whereas two countries and UK–Scotland reported unit-based data (Figure 1). The number of participating hospitals varied between countries, showing differences in the national coverage of the surveillance systems (Table 1).

Figure 1. Participation in the surveillance of SSIs, EU/EEA, 2013–2014

Source: ECDC, HAI-Net patient-based and unit-based data, 2013–2014

Overall, 967 191 surgical procedures from 1 955 hospitals were reported in 2013–2014. Of these operations, 898 172 were reported using the patient-based surveillance and 69 019 using the unit-based surveillance (Table 1). The most common surgical procedure types under surveillance were HPRO operations (n=329 766), followed by KPRO operations (n=201 197) and CSEC operations (n=199 546).

Table 1. Number of reporting hospitals and reported surgical procedures by country and type of operation, EU/EEA, 2013–2014

Country	Number of reporting hospitals	No. of CABG procedures	No. of CHOL procedures	No. of COLO procedures	No. of CSEC procedures	No. of HPRO procedures	No. of KPRO procedures	No. of LAM procedures	Total
Patient-based data									
Austria	48	954	1 133	389	8 390	11 703	3 229		25 798
Estonia	1	304			469				773
Finland	13				13 712	11 642			25 354
France	345	1 159	18 010	7 649	28 936	31 465	10 387	2 417	100 023
Germany	845	24 955	33 955	16 800	39 093	102 209	51 863	8 010	276 885
Hungary	53	402	7 188	1 350	7 591	2 909	1 980	1 727	23 147
Italy	126	2 588	13 379	9 194	18 470	5 176	2 507	1 998	53 312
Lithuania	23	946	1 760	592	2 883	960	549		7 690
Malta	1	384			400	573	792		2 149
Netherlands	67		8 673	6 647	10 717	13 893	9 946	806	50 682
Norway	59	4 198	8 880	6 205	18 668	22 323			60 274
Portugal	37	49	5 509	3 006	3 400	3 031	2 357	1 070	18 422
Slovakia	8		1 145						1 145
UK–England	259	11 982	295	6 517		95 997	85 951	6 935	207 677
UK–Northern Ireland	11				11 420	3 609	2 795	804	18 628
UK–Wales	17				15 277	5 695	5 241		26 213
Subtotal	**1 913**	**47 921**	**99 927**	**58 349**	**165 714**	**313 255**	**189 239**	**23 767**	**898 172**
Unit-based data									
Czech Republic	1				566				566
Romania	8	254	2 695	2 116	653	17*		1087	6 822
UK–Scotland	33				33 179	16 494	11 958		61 631
Subtotal	**42**	**254**	**2 695**	**2 682**	**33 759**	**16 511**	**11 958**	**1 087**	**69 019**
EU/EEA	**1 955**	**48 175**	**102 622**	**61 031**	**199 546**	**329 766**	**201 197**	**24 854**	**967 191**

Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia and the United Kingdom (England, Northern Ireland, Scotland and Wales)

* Excluded from further analysis because fewer than 20 surgical procedures of this type were reported by this country.

CABG: coronary artery bypass graft, CHOL: cholecystectomy, COLO: colon surgery, CSEC: caesarean section, HPRO: hip prosthesis surgery, KPRO: knee prosthesis surgery, LAM: laminectomy

Patient characteristics per surgical procedure type were only available for the patient-based data. The ratio of male to female patients was the highest in CABG operations (4.0) and the lowest in CHOL, HPRO and KPRO operations (0.6), excluding CSEC operations (0) (Table 2). The median age of patients varied from 31 years in CSEC operations to 72 years in HPRO operations. The post-operative in-hospital case fatality (4.1%), and the proportion of contaminated or dirty operations (30.4%) were the highest among COLO operations. The median duration of operation was the longest in CABG operations (199 minutes), and the median length of post-operative stay was the longest (8 days) in CABG and COLO operations. The proportion of urgent operations varied from 2.1% in KPRO operations to 54% in CSEC operations. In all surgical procedure types, apart from CHOL operations, more than 80% of patients received antibiotic prophylaxis. Of CHOL operations, 76% were reported as endoscopic operations compared with 26% of COLO operations.

Table 2. Characteristics of patients by surgical procedure type, patient-based data, EU/EEA, 2013–2014

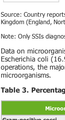
Characteristics	CABG	CHOL	COLO	CSEC	HPRO	KPRO	LAM
Surgical procedures (n)	47 921	99 927	58 349	165 714	313 255	189 239	23 767
Sex ratio (male:female)	4.0:1	0.6:1	1.0:1	0:1	0.6:1	0.6:1	1.1:1
Median age (years)	69	56	69	31	72	70	56
Post-operative in-hospital case fatality (%)	1.6	0.5	4.1	0.0	1.5	0.2	0.2
Contaminated or dirty operations (%)	0.5	15.4	30.4	6.3	1.3	0.7	0.9
Median duration of operation (minutes)	199	60	140	37	75	79	80
Median length of post-operative stay (days)	8	3	8	4	7	5	4
Urgent operations (%)	8.7	17.4	18.2	53.6	10.5	2.1	5.2
Antibiotic prophylaxis (%)	97.4	48.3	90.2	84.6	97.2	98.2	87.8

Source: Country reports from Austria, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Malta, the Netherlands, Norway, Portugal, Slovakia and the United Kingdom (England, Northern Ireland and Wales).
See Table 1 for reporting hospitals and reported surgical procedures in EU/EEA countries.

CABG: coronary artery bypass graft, CHOL: cholecystectomy, COLO: colon surgery, CSEC: caesarean section, HPRO: hip prosthesis surgery, KPRO: knee prosthesis surgery, LAM: laminectomy

In 2013–2014, 18 364 SSIs were reported using patient- and unit-based surveillance. Of these, 10 288 (56%) were superficial, 4 722 (26%) deep and 3 318 (18%) organ/space SSIs. In 36 (0.2%) SSIs, the type of SSI was unknown. The proportion of deep or organ/space SSIs was 18% in CSEC operations, 33% in CHOL operations, 48% in COLO operations, 48% in LAM operations, 52% in CABG operations, 62% in KPRO operations and 67% in HPRO operations (Figure 2). Forty-one per cent of the SSIs were diagnosed in hospitals, whereas 53% were detected after discharge; for 6% the discharge date was unknown. The proportion of SSIs diagnosed in-hospital varied from 15% in CSEC operations to 67% in COLO operations.

Figure 2. Types of SSI by surgical procedure type, EU/EEA, 2013–2014



Source: Country reports from: Austria, the Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia and the United Kingdom (England, Northern Ireland, Scotland and Wales).
See Table 1 for reporting hospitals and reported surgical procedures in EU/EEA countries.

The percentage of SSIs varied by surgical procedure type:

For CABG operations, the percentage of SSIs was 3.0%, with an inter-country range from 2.4% to 6.7%.

For CHOL operations, the percentage of SSIs was 1.8%, with an inter-country range from 0.7% to 6.0%.

• In endoscopic CHOL operations, the percentage of SSIs was 1.5%, with an inter-country range from 0.4% to 5.6%.

• In non-endoscopic CHOL operations, the percentage of SSIs was 4.2%, with an inter-country range from 0.8% to 12.0%.

For COLO operations, the percentage of SSIs was 9.5%, with an inter-country range from 4.0% to 16.1%.

• In endoscopic COLO operations, the percentage of SSIs was 7.3%, with an inter-country range from 2.7% to 10.3%.

• In non-endoscopic COLO operations, the percentage of SSIs was 10.7%, with an inter-country range from 4.5% to 17.1%.

For CSEC operations, the percentage of SSIs was 2.2%, with an inter-country range from 0.6% to 7.7%.

For HPRO operations, the percentage of SSIs was 1.1%, with an inter-country range from 0.3% to 3.8%.

For KPRO operations, the percentage of SSIs was 0.6%, with an inter-country range from 0.0% to 3.4%.

For LAM operations, the percentage of SSIs was 0.7%, with an inter-country range from 0.1% to 2.1%.

Trend analysis of the yearly percentage of SSIs showed an increasing trend for CHOL operations (p<0.001) and a decreasing trend for CABG (p<0.001), CSEC (p<0.001), KPRO (p<0.001) and LAM operations (p=0.018) in 2011–2014 (Figure 3). For COLO and HPRO operations, no significant trend was observed in 2011–2014.

Figure 3. Trends of percentage of SSIs by year and surgical procedure type, EU/EEA, 2011–2014

Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia and United Kingdom (England, Northern Ireland, Scotland and Wales).
See Table 1 for reporting hospitals and reported surgical procedures in EU/EEA countries.

Similarly, incidence density of in-hospital SSIs varied by surgical procedure type:

For CABG operations, the incidence density of in-hospital SSIs was 1.6, with an inter-country range from 0.6 to 11.4.

For CHOL operations, the incidence density of in-hospital SSIs was 1.5, with an inter-country range from 0.7 to 9.1.

• In endoscopic CHOL operations, the incidence density of in-hospital SSIs was 0.8, with an inter-country range from 0.3 to 2.3.

• In non-endoscopic CHOL operations, the incidence density of in-hospital SSIs was 3.2, with an inter-country range from 0.3 to 7.8.

For COLO operations, the incidence density of in-hospital SSIs was 5.7, with an inter-country range from 2.9 to 8.8.

• In endoscopic COLO operations, the incidence density of in-hospital SSIs was 4.5, with an inter-country range from 2.5 to 6.4.

• In non-endoscopic COLO operations, the incidence density of in-hospital SSIs was 6.0, with an inter-country range from 2.6 to 9.8.

For CSEC operations, the incidence density of in-hospital SSIs was 0.7, with an inter-country range from 0.0 to 2.5.

For HPRO operations, the incidence density of in-hospital SSIs was 0.5, with an inter-country range from 0.1 to 1.8.

For KPRO operations, the incidence density of in-hospital SSIs was 0.2, with an inter-country range from 0.0 to 1.7.

For LAM operations, the incidence density of in-hospital SSIs was 0.5, with an inter-country range from 0.0 to 2.7.

Trend analyses of yearly incidence density of in-hospital SSIs showed a decreasing trend for CABG (p<0.001), COLO (p=0.004) and KPRO operations (p<0.001) in 2011–2014, although for CABG operations the incidence density of in-hospital SSIs remained roughly the same during 2011–2013 before decreasing only in 2014 (Figure 4). No significant trends were observed for CHOL, CSEC, HPRO and LAM operations in 2011–2014.

Figure 4. Trends of incidence density of in-hospital SSIs by year and surgical procedure type, EU/EEA, 2011–2014

Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia and the United Kingdom (England, Northern Ireland, Scotland and Wales). See Table 1 for the details of countries participating in the surveillance in each operation type.

Note: Only SSIs diagnosed in-hospital were included.

Data on microorganisms were reported for 7 114 (38.7%) SSIs from 13 countries using patient- or unit-based surveillance. Overall, Staphylococcus aureus (17.0%) and Escherichia coli (16.9%) were the most commonly reported microorganisms (Table 4). The distribution of microorganisms varied by surgical procedure type. For CHOL and COLO operations, the majority of the reported microorganisms were Enterobacteriaceae. For all other surgical procedure types, gram-positive cocci were the most commonly reported microorganisms.

Table 3. Percentages of microorganisms identified in SSIs by surgical procedure type, pooled data from 13 EU/EEA countries, 2013–2014 (n=9 858)

Microorganisms	CABG (n=1 559)	CHOL (n=747)	COLO (n=4 666)	CSEC (n=528)	HPRO (n=2 507)	KPRO (n=814)	LAM (n=141)	Total (n=9 858)
Gram-positive cocci	**61.0**	**35.1**	**31.1**	**50.0**	**65.3**	**69.2**	**61.0**	**47.9**
Staphylococcus aureus	19.4	9.8	4.3	25.8	30.8	34.4	29.1	17.0
Coagulase-negative staphylococci	33.2	2.8	2.1	10.0	18.8	22.7	18.4	12.1
Enterococcus species	7.6	19.4	21.9	7.2	11.3	6.3	9.2	15.2
Streptococcus species	0.3	3.0	2.4	5.7	3.5	3.8	3.5	2.8
Other Gram-positive cocci	0.5	0.1	0.3	1.3	1.0	2.0	0.7	0.7
Gram-positive bacilli	**1.2**	**0.7**	**0.4**	**1.5**	**2.2**	**2.8**	**0.7**	**1.2**
Gram-negative bacilli, Enterobacteriaceae	**23.5**	**45.8**	**48.5**	**32.8**	**18.7**	**15.4**	**22.7**	**34.1**
Escherichia coli	4.3	22.1	28.6	17.4	6.1	4.1	9.2	16.9
Citrobacter species	2.1	2.8	2.0	0.9	0.4	0.4	1.4	1.5
Enterobacter species	4.5	5.8	4.6	3.8	3.2	3.2	0.7	4.1
Klebsiella species	4.6	10.4	5.0	3.6	2.2	2.3	5.0	4.4
Proteus species	3.9	1.9	3.2	4.2	3.5	2.6	3.5	3.3
Serratia species	1.3	0.7	0.6	0.6	0.7	0.9	2.1	0.8
Other Enterobacteriaceae	2.7	2.2	4.5	2.3	2.7	2.0	0.7	3.3
Gram-negative non-fermentative bacilli	**6.3**	**5.9**	**9.1**	**4.7**	**6.0**	**6.5**	**9.9**	**7.3**
Acinetobacter species	0.5	2.0	0.5	0.2	0.7	0.7	1.4	0.7
Haemophilus species	0.2	0.1	0.0	0.6	0.0	0.1	0.0	0.1
Pseudomonas aeruginosa	4.5	3.8	7.8	3.0	4.3	4.3	8.5	5.8
Pseudomonadaceae family, other	0.7	0.0	0.2	0.2	0.8	0.6	0.0	0.4
Stenotrophomonas maltophilia	0.4	0.0	0.1	0.0	0.1	0.5	0.0	0.2
Other gram-negative non-fermentative bacilli	0.1	0.0	0.3	0.8	0.1	0.2	0.0	0.2
Anaerobes	**1.4**	**3.4**	**4.3**	**4.7**	**1.2**	**1.1**	**3.5**	**2.9**
Bacteroides species	0.3	1.6	3.5	1.7	0.5	0.2	0.0	1.8
Other anaerobes	1.1	1.7	0.8	3.0	0.7	0.9	3.5	1.0
Other bacteria	**5.5**	**7.7**	**3.6**	**5.3**	**6.0**	**4.9**	**1.4**	**4.9**
Fungi, parasites	**1.0**	**1.5**	**3.0**	**0.9**	**0.4**	**0.1**	**0.7**	**1.7**
Candida species	1.0	1.3	2.8	0.9	0.4	0.0	0.7	1.5
Other fungi or parasites	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.1

Source: Country reports from the Czech Republic, Estonia, France, Germany, Hungary, Italy, Lithuania, Malta, the Netherlands, Portugal, Romania, Slovakia and the United Kingdom (England).
See Table 1 for reporting hospitals and reported surgical procedures in EU/EEA countries.

Discussion

The results of SSI surveillance presented in this report constitute a useful source of information on SSIs in the participating EU/EEA countries in 2013–2014. The number of reported surgical procedures and reporting countries remained stable in comparison to the previous years. However, the observed inter-country variation and the fact that not all EU/EEA Member States participated, limits the extent to which the overall results can be considered to be representative of the overall EU/EEA situation. For example, some

European countries, which according to the ECDC point prevalence survey reported a low proportion of SSIs in healthcare-associated infections, did not participate in SSI surveillance [1]. In addition, national representativeness and surveillance methods vary considerably from country to country, which makes it difficult to compare data across countries. Important factors influencing the percentage of SSIs are the length of the follow-up period after surgery and the differences in post-discharge surveillance methods, especially in those surgical procedures where a large proportion of SSIs are detected after hospital discharge. Inter-country comparisons should therefore use the incidence density of in-hospital SSIs, if possible.

Both percentage and incidence density of SSIs were highest in COLO operations and lowest in KPRO and LAM operations [5,6]. However, the risk of SSI differs between surgical procedure types because of the different population groups that undergo these operations and because of the different proportions of clean and contaminated operations for each operation type. Therefore, comparisons of SSI rates should be restricted to each surgical procedure type, which can then be compared across countries and years.

In 2011–2014, a statistically significant increasing trend was only observed in the percentage of SSIs in CHOL operations. There was no statistically significant trend in the incidence density of SSIs in CHOL operations, and increases were only observed in SSIs diagnosed after discharge from the hospital. It is thus possible that this trend merely reflects improvements in the post-discharge SSI surveillance in some EU/EEA countries.

The 2011–2014 surveillance data show statistically significant decreasing trends in SSIs associated with four other types of surgery. Three types of surgery also showed a decrease in the incidence density of in-hospital SSIs. The decrease in 2011–2014 in both percentage of SSIs and incidence density of in-hospital SSIs in CABG and KPRO operations suggests that the prevention of SSIs for these surgical procedures has improved, both in hospitals and during the post-discharge period.

A comparison of the 2011–2014 trends with those reported from EU/EEA countries for 2008–2011 shows a continuous downward trend in the percentage of SSIs in CSEC and KPRO operations and in the incidence density of in-hospital SSIs in COLO operations throughout the entire 2008–2014 timespan [5]. It is, however, important to note that the yearly trends in the indicators can also be affected by the different mix of hospitals that each year participate in SSI surveillance.

The percentages of SSIs in the EU/EEA associated with certain surgical procedures were in large part similar to those reported from the United States for 2006–2008, apart from the considerably higher EU/EEA rates for CHOL and COLO surgery [9]. The percentages of SSIs for CHOL operations in the EU/EEA were also higher than those reported from Turkey for 2005–2011 [10]. All participating EU/EEA countries reported higher percentages of SSIs for CHOL operations than the United States. There is no clear explanation for these differences because the data reported from the United States and Turkey include the same subgroups that are used for EU/EEA surveillance. The data on the proportion of endoscopic operations also offer no convincing explanation [9,10]. But since the average post-operative stay after CHOL operations is very short (median three days), the intensity of post-discharge surveillance could explain the higher proportions of SSIs after cholecystectomies in some EU/EEA countries.

Public health conclusions

Surveillance is one of the key components in the prevention of healthcare-associated infections and an important tool for monitoring the effectiveness of prevention and control measures [11]. In fact, surveillance of SSIs in participating EU/EEA countries may have been a factor in driving the observed improvements and decreasing trends. To further strengthen the surveillance of SSIs in Europe, ECDC will update the surveillance protocol in 2017, adding structure and process indicators for infection prevention and control. This will provide participating hospitals with an improved tool to compare their performance with similar hospitals, both nationally and internationally. These changes aim to increase the usefulness of SSI surveillance networks in EU/EEA countries and increase hospital participation across Europe.

Further efforts are needed to increase the representativeness of European SSI surveillance by extending surveillance to other EU/EEA countries. ECDC will continue to provide support to countries that want to establish or improve their national surveillance networks. In addition to the SSI protocol update, ECDC will introduce a free software package (HeliosWin.Net) for SSI surveillance and make it available to network coordination centres and hospitals in 2017. The Centre will also promote the possibility to collect SSI surveillance data for shorter periods of time in all EU/EEA countries in 2018.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases [SSI data will become available in 2017]

Annual Epidemiological Report 2014 – Targeted surveillance of surgical site infections and of infections acquired in intensive care units (pp. 17–23): http://ecdc.europa.eu/en/publications/publications/antimicrobial-resistance-annual-epidemiological-report.pdf

Annex

Table. Overview of national surveillance systems, 2013–2014

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Table A1. Percentage of missing values by TESSy variable and year, patient-based data, 2013–2014
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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Syphilis

Reporting on data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Syphilis. [Internet]. Stockholm: ECDC; 2016 [cited YYYY MM DD]. Available from: http://ecdc.europa.eu/en/healthtopics/Syphilis/Pages/Annual-epidemiological-report.aspx

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Key facts

- In 2014, 24 541 syphilis cases were reported in 29 EU/EEA Member States (data were not available from Austria and Liechtenstein), an overall rate of 5.1 per 100 000 population. Reported syphilis rates were six times higher in men than in women.
- The majority of cases were reported in people older than 25 years, with young people between 15 and 24 years of age accounting for only 13% of cases.
- Almost two-thirds (63%) of the syphilis cases with information on transmission category were reported in men who have sex with men (MSM).
- Trends since 2010 show that overall syphilis rates have been increasing, particularly among men, mainly due to increased cases among MSM.
- Rates among women have decreased over time.

Methods

Click here for a detailed description of the methods used to produce this annual report

In 2014, the majority of countries reported data based on the EU case definitions. Five countries reported using national case definitions, and five countries did not state which case definition they were using.

Most countries (24) have comprehensive surveillance systems. Four have sentinel systems which only capture syphilis diagnoses from a selection of clinics, while one country reported having an 'other' type of surveillance for syphilis (Annex 1). Reporting of syphilis infection is compulsory in 25 countries, voluntary in three (all with sentinel systems), and reported as 'other' in the United Kingdom.

In the analyses below, data from sentinel systems are not used in the calculation of national or overall rates as the coverage is not always clear and denominators are therefore not available. In addition, cases are classified according to the date of diagnosis in all presented analyses. All reported cases of syphilis are included in the analyses below, which might also include cases of non-infectious syphilis for some countries. It was not possible to exclude cases of late latent syphilis for some countries because the stage of infection is not reported by all countries.

Epidemiology: demographic variables

In 2014, 24 541 syphilis cases were reported in 29 countries, giving an overall notification rate of 5.1 per 100 000 population (Table 1) for countries with comprehensive surveillance systems. The highest rate was observed in Malta (11.5 per 100 000 population), followed by Lithuania (8.7), Iceland (7.7) and Spain (7.7). Rates below 2.5 per 100 000 population were observed in Croatia, Cyprus, Greece, Italy and Slovenia (Figure 1).

Table 1. Number and rate of reported confirmed syphilis cases per 100 000 population by country and year, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	59	-	72	-	78	-	538	-	72	-
Belgium	704	-	746	-	778	-	1030	-	1238	-
Bulgaria	397	5.3	314	4.3	309	4.2	354	4.9	460	6.3
Croatia					28	0.7	80	1.9	51	1.2
Cyprus	20	2.4	16	1.9	6	0.7	12	1.4	18	2.1
Czech Republic	462	4.4	372	3.5	329	3.1	402	3.8	396	3.8
Denmark	413	7.5	427	7.7	343	6.1	317	5.7	361	6.4
Estonia	69	5.2	66	5	40	3	39	3	33	2.5
Finland	200	3.7	176	3.3	203	3.8	156	2.9	203	3.7
France	657	-	784	-	865	-	1014	-	1332	-
Germany	3033	3.7	3702	4.5	4414	5.4	5012	6.1	5718	7.1
Greece	241	2.2	272	2.4	363	3.3	300	2.7	247	2.3
Hungary	594	-	565	-	621	-	627	-	622	-
Iceland	5	1.6	2	0.6	5	1.6	3	0.9	25	7.7
Ireland	115	2.5	150	3.3	110	2.4	163	3.6	200	4.3
Italy	1182	2	992	1.7	1138	1.9	1236	2.1	388	0.6
Latvia	122	5.8	143	6.9	148	7.2	127	6.3	134	6.7
Liechtenstein										
Lithuania	345	11	273	8.9	227	7.6	269	9.1	257	8.7
Luxembourg	13	2.6	28	5.5	19	3.6	27	5	27	4.9
Malta	25	6	45	10.8	35	8.4	45	10.7	49	11.5
Netherlands	695		545		649		743		975	
Norway	118	2.4	130	2.6	109	2.2	185	3.7	189	3.7
Poland	914	2.4	941	2.5	961	2.5	1324	3.5	1147	3
Portugal	179	1.7	159	1.5	267	2.5	197	1.9	356	3.4
Romania	1809	8.9	2349	11.6	1717	8.5	1392	7	1267	6.4
Slovakia	328	6.1	416	7.7	412	7.6	337	6.2	357	6.6
Slovenia	40	2	79	3.9	63	3.1	35	1.7	23	1.1
Spain	3187	6.9	3522	7.5	3641	7.8	3723	8	3568	7.7
Sweden	198	2.1	206	2.2	197	2.1	275	2.9	244	2.5
United Kingdom	2898	4.6	3189	5.1	3285	5.2	3537	5.5	4656	7.2
EU/EEA total	**18932**	**4.1**	**20681**	**4.6**	**21360**	**4.6**	**23499**	**4.9**	**24541**	**5.1**

Source: Country reports
Legend: - = rate not calculated because country has a sentinel surveillance system

Figure 1. Rate of reported confirmed syphilis cases per 100 000 population, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, 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.

The male-to-female ratio in 2014 was 6.2:1. The rate was 8.3 cases per 100 000 population in men (18 045 cases) and 1.3 cases per 100 000 population in women (2 897 cases). There were marked differences in the male-to-female ratios across countries: ratios above 10 to 1 were reported by France, Germany, Ireland, the Netherlands, Norway and the United Kingdom while six countries reported male-to-female ratios below 2:1 (Cyprus, Finland, Latvia, Lithuania, Romania and Slovakia). The male-to-female ratio has increased continuously, from 2.5:1 in 2005 to 6.2:1 in 2014.

Figure 2: Syphilis male-to-female ratio in 27 EU/EEA countries, 2014

Information on age was available for 26 countries in 2014. No information on age was available for Bulgaria, Croatia and Spain. Overall, 22% of cases lacked information on age or had the age reported incorrectly.

In 2014, the largest proportion of cases was reported in the age group above 45 years of age (30%). However, almost equally large proportions of cases were reported in the age groups 25–34 years (29%) and 35–44 years (27%) (Figure 3). Young adults aged 15–24 years accounted for 13% of all reported cases. Age-specific rates were highest among 25–34-year-olds (11.2 per 100 000), but were also high among 35–44-year-olds (9.3) and 20–24-year-olds (8.7). Age and gender-specific rates were higher among men in all age-groups. The highest age and gender-specific rates were observed among men aged 25-34 years (19.1 per 100 000).

Figure 3. Rate of reported confirmed syphilis cases per 100 000 population, by age and gender, EU/EEA, 2014

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

Epidemiology: transmission, HIV status and syphilis stage

In 2014, information on transmission category was available for over 60% of cases from 16 countries. These cases represent 67% of the reported syphilis cases (n=16 504). Of these cases, transmission category was indicated as MSM (63%), heterosexual (24%) and unknown (13%) (Figure 4). Among these 16 countries, the percentage of cases diagnosed in MSM ranged from below 10% in Romania and Slovakia to more than 70% in Denmark, France, the Netherlands, Norway and the United Kingdom.

In 2014, data on the HIV status were reported by 11 countries, which accounted for 41% of syphilis cases (n=10 138). Of these, 29% were HIV positive (either known or newly diagnosed) and 50% were HIV negative. The HIV status was unknown for 21%. Among cases for whom the HIV status was known, 36% were HIV positive. In MSM with known HIV status, 46% were HIV positive.

Details on the stage of syphilis infection were provided by 17 countries and represent 43% of all reported cases in 2014. The majority of cases were reported as primary (30%), secondary (27%) or early latent infection (35%) (Figure 5), while some cases were reported as 'late latent' or 'latent syphilis infection' (i.e. the duration of the infection was unknown). The distribution across countries varied: Iceland, Ireland, Portugal, Slovenia, Sweden and the United Kingdom reported the largest proportion of their cases as primary syphilis; Malta was the only country to report the largest proportion of cases as secondary syphilis, whereas the Czech Republic, Estonia, France, Latvia, Netherlands, Norway and Romania reported the largest proportions as early latent.

Figure 4. Percentage of syphilis infections by transmission category and gender (n= 16 504), EU/EEA, 2014

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

Figure 5. Distribution of reported syphilis infection stages, EU/EEA, 2014

Source: Country reports from the Czech Republic, Estonia, France, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden, the United Kingdom.

Epidemiology: trends 2005–2014

Between 2005 and 2014, 208 134 cases of syphilis were reported in 30 countries. Since 2006, all 30 countries have consistently reported data (except for Austria, which did not report data in 2014 due to an ongoing revision of the surveillance system, and Croatia, which reported data from 2012 onwards following accession to the European Union). Among the countries reporting consistently between 2005 and 2014, the trend of reported syphilis infections per 100 000 population had declined from 2005 to 2009 (Figure 6). Since 2010, however, the overall trend is increasing. Diverging trends can be observed between genders, with a marked increase among men and a decrease among women. Between 2010 and 2014, many countries, particularly in western Europe, show a sharp increase in the number of reported syphilis infections, with increases of over 50% in Belgium, France, Germany, Iceland, Ireland, Luxembourg, Malta, Norway, Portugal and the United Kingdom.

Between 2005 and 2014, the proportion of cases among age groups below 35 years decreased, while there were increases among those aged 35 years or over. The largest increases were seen in those aged 45 years or over: their proportion increased from 18% to 30%. Age-specific rates decreased among all age groups until 2010 (most marked among those below 25 years of age), but since then have increased among older age groups or remained stable (or decreased) in persons below 25 years of age (25–34: +20%; 35–44: +29%; 45 and over: +43%).

Trends by transmission group (Figure 7) in countries which provided transmission category data between 2009 and 2014 show a steep increase in reported cases among MSM particularly since 2008; cases among heterosexuals appear to be stable in recent years.

Figure 6. Rate of reported confirmed syphilis cases per 100 000 population, EU/EEA countries reporting consistently, 2005–2014

Source: Country reports from Bulgaria, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Portugal, Romania, Spain, Sweden, the United Kingdom.

Figure 7. Number of reported confirmed syphilis cases by gender and transmission category, EU/EEA countries reporting consistently, EU/EEA, 2009–2014

Source: Country reports from Cyprus, the Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Romania, Slovenia, Sweden, the United Kingdom.

Discussion

The number and rate of reported syphilis cases has continued to increase in 2014. The increases continue to be driven by increased cases among men, specifically among MSM, with a sharper increase in 2014 compared to previous years. Even in countries not reporting transmission data (e.g. Poland), MSM appear to contribute a significant proportion of syphilis cases [1]. Trends among women and heterosexual men appear stable in recent years. The continuing increase among MSM, as for gonorrhoea, is likely to be due to both behavioural and testing reasons. The concomitant rise in the trend for gonorrhoea, HIV, LGV and cases of sexually transmitted enteric STI [2, 3] suggest that high-risk behaviour is increasing, possibly in the context of HIV sero-adaptive behaviours. This is particularly relevant when considering the high proportion of HIV co-infections, particularly among MSM. The introduction of pre-exposure prophylaxis for HIV might also affect trends in the future due to changing sexual behaviour (although so far not observed in European studies) and increased testing for sexually transmitted infections as part of client management pathways [4, 5].

Reported rates of syphilis infection across Europe vary from below 1 per 100 000 population in Italy to 11.5 in Malta. The range in reported rates of infection is narrower compared to other STI such as chlamydia and gonorrhoea, and this likely reflects long-standing surveillance for the infection, frequently with serological methods which are not as prone to differences in testing as for other bacterial STI. Despite this, there are clearly differences across Europe. Cases are diagnosed at different stages across Europe, possibly reflecting different opportunities for diagnosis across Europe and/or awareness of the infection. Differences in surveillance systems may also contribute to these differences; reporting of non-infectious cases, for example, may contribute to differences in overall numbers between countries.

Overall, there has been an improvement in the completeness compared with previous reports, however for some variables it is still difficult to interpret results and comparisons; disease trends should be interpreted carefully. Underreporting of MSM as transmission category, for example, is likely in many countries.

Public health conclusions

The increasing trend of syphilis in many EU/EEA countries, driven by infections among MSM, is likely linked to changes in sexual behaviour among MSM. Also contributing to this trend are more complete reporting and improved case detection through, for example, more testing among HIV-positive MSM as recommended in current HIV management guidelines. Promoting safe sexual behaviour and increasing testing rates among risk groups through targeted prevention campaigns is essential to prevent cases and reduce the risk of the complications of late stages of syphilis infection. Approaches that use social media and dating apps [6] for prevention campaigns may be considered in addition to traditional approaches.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

European Centre for Disease Prevention and Control. Sexually transmitted infections in Europe 2013. Stockholm: ECDC; 2015. Available from: http://ecdc.europa.eu/en/publications/Publications/sexual-transmitted-infections-europe-surveillance-report-2013.pdf

Annex. Surveillance systems overview

Table. Syphilis, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Tetanus

Reporting on 2014 data retrieved from TESSy* on 7 July 2016
Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Tetanus. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/Tetanus/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, 84 cases of tetanus, including 48 confirmed cases, were reported to TESSy.
- The notification rate was 0.02 cases per 100 000 population, slightly lower than in previous years.
- Adults aged 65 and above were the most affected age group.
- Cases tended to occur more in warmer months when outdoor activity is higher.
- The current epidemiology of tetanus in the EU/EEA may be explained by a lack of vaccination or waning immunity in older populations.
- Due to the severity of tetanus, there is a need to maintain high vaccination coverage in all age groups and to implement catch-up/booster strategies in countries with higher rates of disease.

Methods

Click here for a detailed description of the methods used to produce this annual report

• In 2014, 26 EU/EEA Member States reported data on tetanus to TESSy; 11 of these 26 countries reported zero cases.

• All Member States except Denmark and France report data on tetanus in accordance with the 2008 or 2012 EU case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council).

• The majority of Member States report data from comprehensive, passive surveillance systems with national coverage. For a summary of the surveillance system characteristics, please refer to the Annex.

Epidemiology

In 2014, 84 cases, including 48 confirmed cases, were reported by 26 EU/EEA countries. Austria, Belgium, Finland, Germany and Liechtenstein did not report data.

Italy (n=35) reported 42% of all cases. The overall confirmed rate was 0.02 cases per 100 000 population. The highest rate was reported by Slovenia (0.3 cases per 100 000 population). Since 2011, there has been a decreasing trend in the notification rate in the EU/EEA.

Table 1. Reported tetanus cases: number and rate per 100 000 population, EU/EEA, 2010–2014

Download Excel version

Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	.	.	0	0.00	.	.	.	.	.	.	.	.	.	.
Belgium	0	0.00	0	0.00	0	0.00	.	.	.	.	.	.	.	.
Bulgaria	2	0.03	4	0.05	2	0.03	1	0.01	Y	C	0	0.00	0.00	0
Croatia	.	.	.	.	1	0.02	0	0.00	Y	C	1	0.02	0.02	0
Cyprus	0	0.00	0	0.00	0	0.00	0	0.00	Y	C	0	0.00	0.00	0
Czech Republic	0	0.00	0	0.00	0	0.00	0	0.00	Y	C	0	0.00	0.00	0
Denmark	0	0.00	0	0.00	0	0.00	1	0.02	Y	C	0	0.00	0.00	0
Estonia	0	0.00	2	0.15	0	0.00	1	0.08	Y	C	0	0.00	0.00	0
Finland	.	.	.	.	.	.	.	.	.	.	.	.	.	.
France	15	0.02	9	0.01	5	0.01	10	0.02	Y	C	4	0.01	0.01	4
Germany	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Greece	5	0.04	11	0.10	7	0.06	5	0.05	Y	C	2	0.02	0.02	0
Hungary	0	0.00	4	0.04	5	0.05	2	0.02	Y	C	2	0.02	0.02	0
Iceland	0	0.00	0	0.00	0	0.00	0	0.00	Y	C	0	0.00	0.00	0
Ireland	0	0.00	0	0.00	1	0.02	1	0.02	Y	C	1	0.02	0.02	0
Italy	57	0.10	58	0.10	54	0.09	51	0.09	Y	C	35	0.06	0.05	35
Latvia	0	0.00	0	0.00	0	0.00	0	0.00	Y	C	0	0.00	0.00	0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	2	0.06	2	0.07	2	0.07	2	0.07	Y	C	1	0.03	0.03	0
Luxembourg	0	0.00	0	0.00	0	0.00	0	0.00	Y	C	0	0.00	0.00	0
Malta	3	0.72	0	0.00	0	0.00	0	0.00	Y	C	0	0.00	0.00	0
Netherlands	1	0.01	6	0.04	2	0.01	1	0.01	Y	C	0	0.00	0.00	0
Norway	0	0.00	0	0.00	1	0.02	0	0.00	Y	C	1	0.02	0.02	1
Poland	16	0.04	14	0.04	19	0.05	14	0.04	Y	C	13	0.03	0.04	0
Portugal	3	0.03	0	0.00	3	0.03	1	0.01	Y	C	2	0.02	0.02	0
Romania	9	0.04	20	0.10	7	0.03	6	0.03	Y	C	3	0.02	0.02	3
Slovakia	0	0.00	1	0.02	0	0.00	0	0.00	Y	C	0	0.00	0.00	0
Slovenia	0	0.00	2	0.10	1	0.05	1	0.05	Y	C	6	0.29	0.28	3
Spain	8	0.02	10	0.02	8	0.02	9	0.02	Y	C	4	0.01	0.01	2
Sweden	0	0.00	3	0.03	0	0.00	3	0.03	Y	C	2	0.02	0.02	0
United Kingdom	9	0.01	3	0.00	6	0.01	7	0.01	Y	C	7	0.01	0.01	0
EU/EEA	**130**	**0.03**	**149**	**0.04**	**124**	**0.03**	**116**	**0.03**	**.**	**C**	**84**	**0.02**	**0.02**	**48**

Source: Country reports. Legend: Y = yes, N = no, C= case based, . = no report, ASR: age-standardised rate

Age and gender distribution

The most affected group was the elderly (≥ 65 years) (0.08 cases per 100 000 population), which accounted for 74% of all cases reported (n=62), followed by those aged 45–64 years (0.01 cases per 100 000 population, n=11) (Figure 1). No cases were reported in the age group 0–4 years. The male-to-female ratio was 0.6:1. Sixty percent of the cases in males (18/30) and 81% of the cases in females (44/54) were in the age group 65 years and above.

Figure 1. Reported tetanus cases, by age and gender, EU/EEA, 2014

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

Seasonality

Most cases were reported between May and September (Figures 2 and 3).

Figure 2. Seasonal distribution of reported, locally acquired Tetanus cases, EU/EEA, 2014 compared with 2010–2013

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

Figure 3. Trend and number of reported tetanus cases, EU/EEA, 2010–2014

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

Outcome

Of the 46 cases with data available, 12 (n=26%) were fatal. All fatal cases were in the age group 65 years and above.

Discussion

Tetanus is a sporadic and relatively uncommon infection in EU/EEA countries, caused by the bacterium Clostridium tetani. Contamination of wounds with tetanus spores in unvaccinated persons can cause an illness characterised by muscular spasms and sometimes death.

The notification rate for tetanus in the EU/EEA countries remains very low, thanks to the widespread use of tetanus vaccination, which is included in the primary vaccination schedule of all EU/EEA countries [1].

The number of reported cases shows a slightly decreasing trend. Most cases were reported in the elderly, probably related to lower vaccination coverage or waning immunity in this population [2]. The peak observed during the summer months may be related to more outdoor activities during this time of year.

Despite the small number of cases, tetanus is associated with high mortality, which could be prevented by vaccination or appropriate post-exposure prophylaxis.

Public health conclusions

Due to its severity, tetanus poses a risk to unvaccinated people. There is a need to maintain high vaccination rates in all age groups and to implement catch-up/booster strategies in countries with higher rates of disease.

References

1. European Centre for Disease Prevention and Control. Vaccine schedule. [Internet.] Stockholm: ECDC; 2016. Available from: http://vaccine-schedule.ecdc.europa.eu/Pages/Scheduler.aspx

2. Wassilak SGF, Roper MH, Kretsinger K, Orenstein WA. Tetanus toxoid. In: Plotkin SA, Orenstein WA, Offit PA, editors. Vaccines. 5th edition. Philadelphia: Saunders Elsevier; 2008. p. 805-39.

Additional Information

ECDC Surveillance Atlas of Infectious Diseases

Annual Epidemiological Report 2014 – vaccine-preventable diseases: http://www.ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=1227

Annex

Table. Tetanus, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Tick-borne encephalitis

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Tick-borne encephalitis. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/tbe/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- 2 057 cases of tick-borne encephalitis were reported to TESSy in 2014, 1 986 of which were confirmed (96.5%).
- The notification rate in 2014 was 0.42 cases per 100 000 population.
- Age and gender distribution shows a clear predominance of cases in over 45-year-olds and in males.
- Most cases of tick-borne encephalitis occurred between June and October, with a peak in July.

Methods

Click here for a detailed description of the methods used to produce this annual report

- Twenty-four EU/EEA countries reported data on tick-borne encephalitis (TBE), six countries reported zero cases (Belgium, Bulgaria, Ireland, Italy, Luxembourg and Spain).

- Sixteen countries used the EU case definition, eight countries did not specify which case definition was used (Belgium, Croatia, Finland, Italy, Luxembourg, Poland and Romania), and Germany used an alternative case definition.

- Nineteen reporting countries have a comprehensive surveillance system. Reporting is compulsory in 18 countries, voluntary in three (France, Luxembourg and the United Kingdom) and 'not specified' in three countries (Belgium, Croatia and Poland). Surveillance is mostly passive except in the Czech Republic, Slovakia and the United Kingdom; the disease surveillance method is not specified for four countries (Annex 1). Data reporting is case-based (except in Croatia) and done at the national level.).

Epidemiology

Tick-borne encephalitis became notifiable at the EU level in 2012. In 2014, 2 057 cases were reported to TESSy, 1 986 of which were confirmed (0.42 cases per 100 000 population). The highest rates were notified in the Baltic States. TBE was predominantly reported among males over 45 years of age. Most cases were identified between June and October.

The notification rate in 2014 was lower than in 2013 (0.62 cases per 100 000 population) and in 2012 (0.52 cases per 100 000 population) in most of the reporting countries, except in Finland, France and Norway, where the rate was stable or slightly increased. In 2014, Greece reported its first case since the start of reporting in TESSY.

The notification rate was the highest in Lithuania (12.0 cases per 100 000 population), followed by Latvia (7.4 cases per 100 000 population) and Estonia (6.2 cases per 100 000 population) (Figure 2). Slovenia showed a high notification rate in 2014 (4.9 cases per 100 000 population), but the 2014 numbers were still three times lower than in 2013 and 1.6 times lower than in 2012. As in 2013 and 2012, the highest number of confirmed cases in 2014 was seen in the Czech Republic (n=410) and Lithuania (n=353) (Table 1).

Table 1. Confirmed TBE cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2012		2013		2014					
	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Confirmed cases	Rate	ASR
Austria	38	0.5	100	1.2	Y	C	81	81	1.0	0.9
Belgium	2	0.0	3	0.0	Y	C	0	0	0.0	0.0
Bulgaria	.	.	.	.	Y	C	0	0	0.0	0.0
Croatia	45	1.1	44	1.0	Y	A	23	23	0.5	0.5
Cyprus	.	.	.	.	.	.	.	.	.	.
Czech Republic	573	5.5	625	5.9	Y	C	410	410	3.9	3.9
Denmark	.	.	.	.	.	.	.	.	.	.
Estonia	178	13.4	114	8.6	Y	C	83	82	6.2	6.2
Finland	39	0.7	38	0.7	Y	C	47	47	0.9	0.8
France	1	0.0	1	0.0	Y	C	9	9	0.0	0.0
Germany	195	0.2	420	0.5	Y	C	265	265	0.3	0.3
Greece	0	0.0	0	0.0	Y	C	1	1	0.0	0.0
Hungary	42	0.4	27	0.3	Y	C	31	26	0.3	0.3
Iceland	.	.	.	.	.	.	.	.	.	.
Ireland	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Italy	.	.	0	0.0	Y	C	0	0	0.0	0.0
Latvia	72	3.5	230	11.4	Y	C	149	149	7.4	7.2
Liechtenstein	.	.	.	.	.	.	.	.	.	.
Lithuania	351	11.7	487	16.4	Y	C	353	353	12.0	11.7
Luxembourg	.	.	.	.	Y	C	0	0	0.0	0.0
Malta	.	.	.	.	.	.	.	.	.	.
Netherlands	.	.	.	.	.	.	.	.	.	.
Norway	7	0.1	6	0.1	Y	C	13	13	0.3	0.3
Poland	119	0.3	136	0.4	Y	C	195	131	0.3	0.3
Portugal	.	.	.	.	.	.	.	.	.	.
Romania	3	0.0	3	0.0	Y	C	1	1	0.0	0.0
Slovakia	31	0.6	157	2.9	Y	C	116	115	2.1	2.1
Slovenia	164	8.0	307	14.9	Y	C	100	100	4.9	4.8
Spain	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Sweden	287	3.0	209	2.2	Y	C	178	178	1.8	1.8
United Kingdom	3	0.0	0	0.0	Y	C	2	2	0.0	0.0
EU/EEA	**2150**	**0.5**	**2907**	**0.6**	**.**	**C**	**2057**	**1986**	**0.4**	**0.4**

Source: Country reports. Legend: Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate

Figure 1. Number of confirmed TBE cases, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Figure 2. Confirmed TBE cases per 100 000 population, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Age and gender distribution

The proportion of confirmed TBEs cases was higher in men (59.2%), with a male-to-female ratio of 1.4:1. The majority of cases belonged to the age group 45–65 years (n=802, 40.4%), regardless of gender. The rate was highest in the age group 45–64 years (0.62 cases per 100 000 population), followed by the age group over 65 years (0.42 cases per 100 000 population). The lowest rates were observed in children.

Figure 3. Confirmed TBE cases, by age and gender, EU/EEA, 2014

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Seasonality

TBE numbers of reported cases started to increase in April, peaked in July and slowly decreased for the rest of the year, with only a small number of cases reported in December and in January (Figure 4). It is unclear if the cases reported in winter are a result of late reporting or if they refer to the day of diagnosis or the onset of symptoms. It is, however, entirely possible to be exposed to ticks – and to get bitten by them – in winter, even in northern countries.

Figure 4. Seasonal distribution of confirmed TBE cases, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Austria, Belgium, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Enhanced surveillance in 2014

Importation status was available for 1 901 confirmed cases, 1.3% (n=25) of which were travel associated. The United Kingdom only had travel-associated cases. For 22 travel-related cases, another EU country was reported as the probable country of infection, mainly Austria (n=6) and Sweden (n=5). The country of infection was unknown for three cases.

Fourteen of 638 cases (2.2%) for which importation status was available had a history of previous immunisation (5.3% in 2013). Five were reported by Austria, five by Estonia, two by Hungary and two by Slovenia. Nine of these cases had received three vaccine doses, and three cases received four doses.

Trend

Tick-borne encephalitis became notifiable at the EU level in 2012. In 2014, the number of confirmed cases was 1 986, lower than in the previous years (2 907 in 2013 and 2 150 in 2012).

Discussion

Tick-borne encephalitis became notifiable in the EU in 2012 and is a growing public health challenge in Europe. The number of countries reporting to TESSy has increased from 19 in 2012 to 24 in 2014; this also includes countries that reported zero cases. During the 2012–2014 period, the annual number of cases reported through routine surveillance was comparable with an ECDC estimate based on an ad hoc survey conducted by ECDC [1].

Cases in people over 45 year of age and cases in males were dominant, possibly due to higher susceptibility to more serious forms of the disease in the elderly and to occupational outdoor exposure in males. Seasonality was comparable with previous surveys and showed a clear peak during the summer months [1][2]. Currently, countries with an increased risk of TBE include Austria, Croatia, the Czech Republic, Estonia, Finland, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia and Sweden [1,2].

Public health conclusions

People in regions where tick-borne encephalitis is endemic should be aware of the risks of exposure to ticks, protect themselves against tick bites and consider immunisation prior to exposure, which offers the most effective protection.

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2. European Centre for Disease Prevention and Control. Tickborne encephalitis (TBE): factsheet for health professionals [Internet]. 2010 [cited 2010 June 16]. Available from: http://ecdc.europa.eu/en/healthtopics/emerging_and_vector-borne_diseases/tick_borne_diseases/tick_borne_encephalitis/basic_facts/Pages/factsheet-health-professionals.aspx

Additional information

ECDC Surveillance Atlas of Infectious Diseases

Tick species in Europe: http://ecdc.europa.eu/en/healthtopics/vectors/vector-maps/Pages/VBORNET-maps-tick-species.aspx

Annex

Table. Tick-borne encephalitis, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Tuberculosis

Reporting on 2014 data retrieved from TESSy* on 2 October 2015.

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Tuberculosis. [Internet]. Stockholm: ECDC; 2016 [cited YYYY MMM DD]. Available from: http://ecdc.europa.eu/en/healthtopics/Tuberculosis/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- Tuberculosis (TB) remains a common infection in EU/EEA countries.
- In 2014, 58 008 cases of TB were reported in 29 EU/EEA countries (excluding Italy and Liechtenstein).
- Notification rates are decreasing in most countries but annual rates of decline are still too small to eliminate TB elimination by 2050 in European low-incidence countries.
- Twenty-seven per cent of TB cases were in people of foreign origin, most of them residing in low-incidence countries.
- Multidrug-resistant TB (MDR TB) was reported for 4.0% of 36 380 cases with drug susceptibility testing results and continues to be most prevalent in the three Baltic countries.
- Of all TB cases with a known HIV status, 4.9% were co-infected with the virus.

Methods

Click here for a detailed description of the methods used to produce this annual report

Since 1 January 2008, ECDC and the WHO Regional Office for Europe (WHO/Europe) have jointly coordinated the collection and analysis of TB surveillance data in Europe.

For the purpose of this report, only data from EU/EEA countries were included.

Multidrug resistance (MDR) indicates resistance to at least isoniazid and rifampicin. Extensive drug resistance (XDR) indicates resistance to (i) isoniazid and rifampicin (i.e. MDR), and (ii) resistance to a fluoroquinolone, and (iii) resistance to one or more of the following injectable drugs: amikacin, capreomycin or kanamycin.

A summary of national surveillance system characteristics is available in the Annex at the bottom of this page.

Epidemiology

In 2014, 58 008 cases of TB were reported in 29 EU/EEA countries (Table 1). As in previous years, three countries (Poland, Romania and the United Kingdom) accounted for approximately 50% of all reported cases, with Romania alone accounting for 27%. The EU/EEA notification rate in 2014 was 12.8 per 100 000 population, which was very similar to 2013, interrupting the continuous decrease observed since 2002. This stagnation is mainly attributable to the absence of 2014 data for Italy, a country with a large population and low notification rate (5.3 per 100 000 in 2013).

Similar to 2012 and 2013, country-specific notification rates in 2014 differed more than 30-fold, ranging from 2.5 in Iceland to 79.7 per 100 000 in Romania (Table 1 and Figure 1). Rates were above 20 per 100 000 population in Bulgaria, Latvia, Lithuania, Portugal and Romania.

In a majority of countries, the notification rates have steadily declined during the period 2010–2014.

Table 1. Numbers and rates of TB cases per 100 000 population by country and year, EU/EEA, 2010–2014

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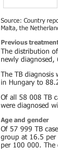
Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	691	8.3	684	8.2	646	7.7	649	7.7	Y	C	582	6.8	6.8	443
Belgium	1086	10	1019	9.3	976	8.8	963	8.6	Y	C	959	8.6	8.8	729
Bulgaria	2649	35.7	2406	32.6	2280	31.1	1932	26.5	Y	C	1872	25.8	25.2	891
Croatia	695	16.2	619	14.4	570	13.3	522	12.2	Y	C	497	11.7	11.1	394
Cyprus	61	7.4	54	6.4	69	8	41	4.7	Y	C	41	4.8	4.7	34
Czech Republic	668	6.4	600	5.7	597	5.7	497	4.7	Y	C	514	4.9	4.7	367
Denmark	366	6.6	381	6.9	389	7	356	6.4	Y	C	320	5.7	5.9	271
Estonia	333	25	339	25.5	289	21.8	287	21.7	Y	C	246	18.7	18.4	194
Finland	317	5.9	324	6	274	5.1	273	5	Y	C	259	4.8	4.6	213
France	5116	7.9	4991	7.7	4978	7.6	4939	7.5	Y	C	4845	7.4	7.6	2518
Germany	4390	5.4	4310	5.3	4210	5.1	4319	5.3	Y	C	4488	5.6	5.6	3206
Greece	487	4.4	489	4.4	558	5	540	4.9	Y	C	519	4.7	4.6	342
Hungary	1741	17.4	1445	14.5	1223	12.3	1045	10.5	Y	C	851	8.6	8.3	334
Iceland	22	6.9	9	2.8	11	3.4	11	3.4	Y	C	8	2.5	2.4	6
Ireland	420	9.2	412	9	359	7.8	376	8.2	Y	C	316	6.9	7.4	230
Italy	4692	7.9	3521	5.9	3142	5.3	3153	5.3	.	.	.	.	.	.
Latvia	935	44.1	885	42.7	993	48.6	904	44.7	Y	C	761	38	38.1	603
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	1938	61.7	1904	62.4	1781	59.3	1705	57.4	Y	C	1607	54.6	54	1267
Luxembourg	29	5.8	26	5.1	45	8.6	38	7.1	Y	C	24	4.4	4.5	17
Malta	32	7.7	33	8	42	10.1	50	11.9	Y	C	46	10.8	10.9	30
Netherlands	1068	6.4	1004	6	956	5.7	844	5	Y	C	823	4.9	5	523
Norway	336	6.9	354	7.2	374	7.5	401	7.9	Y	C	325	6.4	6.6	267
Poland	7509	19.7	8478	22.3	7542	19.8	7250	19	Y	C	6698	17.6	17.4	4781
Portugal	2715	25.7	2609	24.7	2606	24.7	2403	22.9	Y	C	2226	21.3	20.8	1255
Romania	21059	103.8	19202	95.1	18190	90.5	16692	83.4	Y	C	15906	79.7	79	10469
Slovakia	439	8.1	399	7.4	345	6.4	401	7.4	Y	C	336	6.2	6.3	159
Slovenia	172	8.4	192	9.4	138	6.7	140	6.8	Y	C	144	7	6.6	127
Spain	7239	15.6	6798	14.6	6070	13	5588	12	Y	C	5048	10.9	10.7	3374
Sweden	667	7.1	580	6.2	623	6.6	639	6.7	Y	C	670	6.9	7.3	528
United Kingdom	8398	13.4	8915	14.1	8714	13.7	7863	12.3	Y	C	7077	11	11.3	4301
EU/EEA	**76270**	**15**	**72982**	**14.3**	**68990**	**13.5**	**64821**	**12.7**	**.**	**C**	**58008**	**12.8**	**12.8**	**37873**

ASR: age-standardised rate, C: case-based

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, 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 1. Number of TB cases per 100 000 population by country, EU/EEA, 2014



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

Previous treatment, laboratory confirmation and TB site

The distribution of cases by treatment history in 2014 was very similar to the distribution observed in previous years: 44 204 (76.2%) of 58 008 TB cases reported in 2014 were newly diagnosed, 6 683 (11.5%) had been previously treated for TB, and 7 121 (12.3%) had an unknown previous treatment status.

The TB diagnosis was confirmed by a positive laboratory test for 37 873 (65.3%) of 58 008 cases. Country-specific proportions of laboratory-confirmed cases ranged from 39.2% in Hungary to 88.2% in Slovenia.

Of all 58 008 TB cases reported in 2014, 41 076 (70.8%) were diagnosed with only pulmonary TB, 12 672 (21.8%) were diagnosed with extrapulmonary TB, 3 982 (6.9%) were diagnosed with a combination of both, and no TB site was reported for 278 (0.5%).

Age and gender

Of 57 999 TB cases reported with information on age, 38 490 (66.4%) were between 25 and 64 years old. The highest notification rate was observed in the 25–44 years age group at 16.5 per 100 000 (20.9 per 100 000 in males and 12.0 in females, Figure 2). In males, the highest notification rate was observed in the 45–64 years age group at 22.1 per 100 000. The overall male-to-female ratio was 1.8:1.

Figure 2. Number of TB cases per 100 000 population by age and gender, EU/EEA, 2014

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

Origin of cases

Of the 58 008 TB cases notified in 2014, 40 828 (70.4%) were born in or citizens of the reporting country (referred to as 'native'), 15 565 (26.8%) were of foreign origin, and 1 615 (2.8%) were of unknown origin. Country-specific proportions of foreign-origin TB cases ranged from below 1% in Bulgaria, Poland and Romania to above 80% in Cyprus, Iceland, Luxembourg, Malta, Norway, and Sweden. Four countries (France, Germany, Spain and the United Kingdom) accounted for 75% of cases in people of foreign origin.

Drug resistance

Multidrug-resistant TB (MDR TB) was reported in 4.0% (1 463 of 36 380 cases) of cases with drug susceptibility testing results; in Estonia, Latvia and Lithuania, MDR TB was reported in between 12% and 26% of all cases tested for drug susceptibility. The rate of notified MDR TB cases has remained unchanged over the past five years at 0.3 per 100 000 population. Extensively drug-resistant TB (XDR TB) was reported for 194 (17.5%) of 1 111 MDR TB cases that had undergone second-line drug susceptibility testing.

HIV co-infection

HIV status was reported for 21 243 (64.6%) of 32 892 TB cases from 21 countries. Of 21 243 cases with known HIV status, 1 051 (4.9%) were reported as HIV positive. Among countries with at least 50% reporting completeness for HIV status, the proportion of co-infected cases was highest in Latvia, Malta and Portugal at 19.5%, 17.1%, and 14.7%, respectively.

Treatment outcome

Of the 56 189 TB cases notified in 2013 with a treatment outcome reported in 2014, 41 559 (74.0%) were treated successfully, 4 279 (7.6%) died, 682 (1.2%) experienced treatment failure, 3 053 (5.4%) were lost to follow-up, 2 095 (3.7%) were still on treatment in 2014, and 4 521 (8.0%) were not evaluated.

Treatment success had been achieved in 77.6% of new and relapse pulmonary cases, 57.4% of previously treated pulmonary other than relapse cases, 40.7% of MDR TB, and 34.0% of XDR TB cases.

Discussion

In 2014, the overall TB notification rate in the EU/EEA was similar to 2013, interrupting the continuous decrease observed since 2002. The absence of data for Italy, a populous country with a low notification rate in recent years, is probably the main explanation for this levelling off. The next data update should confirm the downward trend. As in previous years, a small number of countries accounts for the vast majority of cases. For example, Romania accounts for 27% of all reported cases.

The decreasing notification rates observed in most countries are reassuring, but annual rates of decline are still too small to envisage TB elimination by 2050 in low-incidence European countries [1].

The estimated TB mortality rate in the EU/EEA was 0.8 deaths per 100 000 population in 2014, approximately 4 000 deaths.

In 2014, notification rates of MDR TB showed no sign of decline confirming the findings of a recent analysis looking at the 2007–2012 period [2].

Finally, treatment success rates have remained unchanged over the past 10 years at approximately 75 %. This unsatisfactory finding is paralleled by a constantly high proportion of cases reported as not evaluated, which leads to the suspicion that the proportion of successful outcomes is perhaps underestimated. The main predictor of treatment failure is drug resistance and associated factors such as relapse or history of previous treatment [3].

Public health conclusions

Tuberculosis remains a common disease and an important cause of morbidity and mortality in Europe.

To achieve TB elimination in low-incidence countries, further efforts to address the most vulnerable and hard-to-reach groups will be necessary. As advocated by a recent paper, the monitoring of high-risk groups using data on social determinants routinely collected by national tuberculosis programmes could improve the efficiency of elimination programmes [4].

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ECDC Surveillance Atlas of Infectious Diseases

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Annex

Table. Tuberculosis, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Tularaemia

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Tularaemia. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/tularaemia/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, a total of 592 cases was reported to TESSy; 526 (88.9%) of these cases were confirmed.
- The EU/EEA notification rate in 2014 was 0.11 cases per 100 000 population.
- There was an overall increase by 70% in the number of reported confirmed cases compared with 2013.
- The highest rates were reported in middle-aged and older men.
- Sweden accounts for most of the reported cases in EU/EEA countries in 2014, followed by Hungary and Spain.

Methods

Click here for a detailed description of the methods used to produce this annual report

• In 2014, 28 EU/EEA countries provided information on tularaemia in humans.

• All reporting countries have a comprehensive surveillance system, except for the Netherlands, which did not provide any specific information. Twelve countries (Austria, Belgium, Cyprus, Greece, Iceland, Italy, Latvia, Luxembourg, Malta, Romania and the United Kingdom) reported zero human cases.

• Twenty-two countries used the EU case definition. Germany and Italy used an alternative case definition. Belgium, Finland, France and the Netherlands did not specify their case definition or it was unknown.

• The reporting is compulsory in 25 countries, voluntary in two countries (Belgium and the United Kingdom) and 'not specified' for the Netherlands. The surveillance is mostly passive except in the Czech Republic and Slovakia ('not specified' for the Netherlands) (Annex).

Epidemiology

The overall notification rate was 0.11 per 100 000 population, higher than the rate reported in 2013 (0.06 per 100 000 population). As in the previous four years, the notification rate was highest in Sweden (1.56 per 100 000), slightly exceeding the rate of 2013 (1.13 per 100 000).The highest increase in notification rate between 2013 and 2014 was seen in Hungary (from 0.5 to 1.4 per 100 000) (Table 1).

Most of the confirmed cases in 2014 were reported by Sweden (n=150) and Hungary (n=140), followed by Spain (n=62) (figure 1). Both Hungary and Spain experienced an outbreak. Only 33% of the cases were confirmed in France and 69% in Spain in 2014.

Table 1. Confirmed tularaemia cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Confirmed cases	Rate	ASR
Austria	3	0.0	0	0.0	2	0.0	2	0.0	Y	C	0	0	0.0	0.0
Belgium	0	0.0	0	0.0	0	0.0	1	0.0	Y	C	0	0	0.0	0.0
Bulgaria	3	0.0	0	0.0	0	0.0	1	0.0	Y	A	1	1	0.0	0.0
Croatia	.	.	.	.	1	0.0	2	0.0	Y	C	2	2	0.0	0.1
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Czech Republic	50	0.5	57	0.5	42	0.4	36	0.3	Y	C	48	48	0.5	0.5
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0.0	2	0.2	0	0.0	1	0.1	Y	C	1	1	0.1	0.1
Finland	91	1.7	75	1.4	233	4.3	15	0.3	Y	C	9	9	0.2	0.2
France	22	0.0	16	0.0	5	0.0	21	0.0	Y	C	57	19	0.0	0.0
Germany	31	0.0	17	0.0	21	0.0	20	0.0	Y	C	21	21	0.0	0.0
Greece	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Hungary	126	1.3	15	0.2	18	0.2	48	0.5	Y	C	140	140	1.4	1.4
Iceland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Italy	1	0.0	1	0.0	4	0.0	1	0.0	Y	C	0	0	0.0	0.0
Latvia	0	0.0	0	0.0	6	0.3	0	0.0	Y	C	0	0	0.0	0.0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	1	0.0	0	0.0	3	0.1	4	0.1	Y	C	4	4	0.1	0.1
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
Netherlands	.	.	.	.	.	.	1	0.0	Y	C	5	5	0.0	0.0
Norway	33	0.7	180	3.7	50	1.0	28	0.6	Y	C	46	46	0.9	0.9
Poland	4	0.0	6	0.0	6	0.0	8	0.0	Y	C	11	11	0.0	0.0
Portugal	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Romania	4	0.0	0	0.0	0	0.0	1	0.0	Y	C	0	0	0.0	0.0
Slovakia	17	0.3	5	0.1	8	0.1	9	0.2	Y	C	6	6	0.1	0.1
Slovenia	0	0.0	0	0.0	4	0.2	2	0.1	Y	C	1	1	0.0	0.0
Spain	1	0.0	1	0.0	1	0.0	0	0.0	Y	C	90	62	0.1	0.1
Sweden	484	5.2	350	3.7	590	6.2	108	1.1	Y	C	150	150	1.6	1.5
United Kingdom	1	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0	0.0	0.0
EU/EEA	**872**	**0.2**	**725**	**0.2**	**994**	**0.2**	**309**	**0.1**	**.**	**C**	**592**	**526**	**0.1**	**0.1**

Source: Country reports. Legend: Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate

Figure 1. Number of confirmed tularaemia cases, EU/EEA, 2014

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

Age and gender distribution

As in previous years, the proportion of male cases was higher (male-to-female ratio 2.5:1). The highest rates in males were observed in the 45–64-year-old group (0.21 cases per 100 000 population), followed by people 65 years and older (0.19 cases per 100 000 population). The rates among females were highest among 45–64-year-olds (0.10 cases per 100 000 population), followed by 5–14 year-olds (0.06 cases per 100 000).

Figure 2. Confirmed tularaemia cases, by age and gender, EU/EEA, 2014

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

Seasonality

Tularaemia shows a seasonal pattern, with most cases occurring between August and October, but some cases also occur in the winter. The 2014 peak of infections was recorded in September, which was consistent with previous years, although below the mean observed during the 2010–2013 period (Figure 3). This was mainly attributable to fewer cases in Sweden and Finland compared with the 2010–2012 period.

Figure 3. Seasonal distribution of confirmed tularaemia cases, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Discussion

Tularaemia is widely distributed throughout most of Europe and has repeatedly shown signs of local emergence and re-emergence in humans and wildlife. The disease shows clear seasonality in humans [1].

Notification rates of tularaemia vary considerably among Member States. In previous years, most cases were diagnosed in Sweden and Finland, followed by Norway, Hungary and the Czech Republic. In 2014, the majority of cases were reported by Sweden, followed by Hungary and Spain. These two countries reported an unusually high number of cases [2]. In Hungary, the increase was most likely due to an increase in the number of common voles [3].

The notification rate in Finland decreased markedly since 2012. After more than 50 years without any autochthonous case, the Netherlands reported one locally acquired human case in 2013, and in 2014, five human cases were reported at different locations; there were also three confirmed cases in hares [4]. In 2015, Germany reported three cases of tularaemia with a history of tick bites (2012 and 2013) [5].

Public health conclusions

Tularaemia is a zoonosis not transmissible from human to human [6]. Prevention consists of avoiding contact with diseased hares (skinning can be particularly infectious), wild rabbits and rodents.

There is no commercial vaccine against tularaemia, although research for the development of a vaccine is ongoing [7]. Francisella tularensis LVS (an attenuated live vaccine strain of Russian origin) can be used to prevent infections in laboratory staff and certain other professional groups (hunters, trappers), but it is not routinely accessible.

Data on tularaemia surveillance in animals in European are available from a joint ECDC/EFSA report [8].

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Additional information

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Annex

Table. Tularaemia, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

West Nile fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – West Nile fever. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/WestNile/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- A total of 74 locally acquired cases was reported in TESSy in 2014, 63 of which were confirmed (85.7%). Three travel-related cases were reported.
- The EU/EEA notification rate for locally acquired cases in 2014 was 0.01 per 100 000 population.
- Compared with 2013, the notification rates for locally acquired cases decreased in all countries, with the exception of Romania where notification rates remained stable.
- As in previous years, the highest notification rate was reported in the ≥65-year-old age group.

Methods

Click here for a detailed description of the methods used to produce this annual report

This report is based on data collected through two complementary processes:

1. A real-time data collection process used by the Member States to timely report cases during the period of high mosquito activity (June–November)

2. An annual data collection process; countries which did not detect any cases during the year are asked to report 'zero cases'. All other countries are encouraged to report complementary data on detected cases if considered relevant.

• In 2014, 25 countries provided information on West Nile fever (WNF) in humans. Four countries (Austria, Greece, Hungary and Italy) reported only locally acquired cases, Romania reported locally acquired cases as well as one travel-associated case. The United Kingdom only reported two travel-associated cases.

• In 2014, 21 countries used the EU case definition, three countries did not specify which case definition was used (Belgium, Finland and Italy), and the United Kingdom used an alternative case definition.

• In 2014, 22 reporting countries had a comprehensive surveillance system, Belgium and France had a sentinel system, and Austria used another disease surveillance system. Reporting is compulsory in 21 countries and voluntary in four (Austria, Belgium, France and the United Kingdom). Surveillance is passive, except in five countries (Belgium, the Czech Republic, France, Greece, Slovakia and the United Kingdom) (Annex 1). Reporting is done at the national level (except Italy) and case based.

• All tables, maps and graphs in this report are based on locally acquired WNF cases.

Epidemiology

All cases reported in Greece, Hungary and Italy were locally acquired. Romania reported both locally acquired cases and imported cases. The United Kingdom only reported imported cases.

Seventy-seven cases of WNF were reported in 2014. Three cases were imported: two in the United Kingdom (acquired in Egypt and in the United States), one in Romania (acquired in Bulgaria).

In addition, 74 locally acquired cases of WNF (63 of which were confirmed), were reported in the EU in 2014. The EU notification rate for locally acquired cases was 0.01 cases per 100 000 population, lower than in 2013 (0.33 cases per 100 000 population). The fact that surveillance systems vary between countries makes direct comparisons difficult. However, compared with 2013, notification rates decreased in all countries (in Greece for the second consecutive year), with the exception of Romania where they remained stable. The highest number of locally acquired WNF cases was observed in Italy (24) and Romania (23), followed by Greece (15). In all, 2014 marked the year with the lowest number of reported cases since the inception of TESSy.

Table 1. Locally acquired West Nile fever cases: number and rate per 100 000 population, EU/EEA, 2010–2014

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Country	2010		2011		2012		2013		2014					
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	National data	Report type	Reported cases	Rate	ASR	Confirmed cases
Austria	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	1	0.0	0.0	1
Belgium	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Bulgaria	.	.	.	.	2	0.0	0	0.0	Y	C	0	0.0	0.0	0
Croatia	.	.	.	.	5	0.3	16	1.1	.	.	.	.	.	.
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Czech Republic	0	0.0	0	0.0	0	0.0	1	0.0	Y	C	0	0.0	0.0	0
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Finland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
France	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Germany	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Greece	262	14.1	100	7.7	161	13.1	86	5.9	Y	C	15	0.1	0.1	13
Hungary	18	0.9	0	0.0	17	0.7	31	1.6	Y	C	11	0.1	0.1	3
Iceland	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Italy	3	0.0	14	0.1	50	0.5	69	0.7	N	C	24	-	-	24
Latvia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Netherlands	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Norway	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Poland	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Portugal	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Romania	57	2.1	11	0.2	14	0.2	24	0.5	Y	C	23	0.1	0.1	22
Slovakia	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Slovenia	0	0.0	0	0.0	0	0.0	1	0.1	Y	C	0	0.0	0.0	0
Spain	2	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
Sweden	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
United Kingdom	0	0.0	0	0.0	0	0.0	0	0.0	Y	C	0	0.0	0.0	0
EU/EEA	**342**	**0.5**	**125**	**0.2**	**249**	**0.4**	**228**	**0.3**	**.**	**C**	**74**	**0.0**	**0.0**	**63**

Source: Country reports. Legend: Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate
Detailed maps are available from: http://ecdc.europa.eu/en/healthtopics/west_nile_fever/West-Nile-fever-maps/Pages/index.aspx

In 2014, locally acquired West Nile fever cases were mostly reported from a clearly defined region in the south-east of the EU.

Figure 1. Number of reported, locally acquired cases of West Nile fever, EU/EEA, 2014

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

Age and gender distribution

The rate of locally acquired West Nile fever cases was higher in men than women (0.02 and 0.01 cases per 100 000, respectively), and the male-to-female ratio was 2.3:1. As in previous years, the highest notification rate was reported in the ≥65-year-old age group (0.04 cases per 100 000, Figure 2). Only one case was reported among children under the age of 15 years.

Figure 2. Reported, locally acquired cases of West Nile fever, by age and gender, EU/EEA, 2014

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

Seasonality

A strong seasonality could be observed: most cases in the EU/EEA between 2010 and 2014 were reported between July and October. Between 2010 and 2014, cases numbers peaked in or around September.

Figure 3. Seasonal distribution of reported, locally acquired West Nile fever cases, EU/EEA, 2014 compared with 2010–2013

Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Enhanced surveillance

In 2014, 65 neuroinvasive and nine non-neuroinvasive infections were reported by five affected countries. The proportion of detected non-neuroinvasive infections was significantly lower than in 2013 when 83 neuroinvasive infections and 63 non-neuroinvasive infections were reported.

Trend

WNF has been notifiable at the EU level since 2008. The number of cases varies from year to year (Figure 4). In 2014, the number of cases was lower than in the years before. In 2010, a strong peak of locally acquired West Nile fever cases was observed, essentially due to the outbreak (262 cases) that affected Greece.

Figure 4: Trend and number of reported, locally acquired cases of West Nile fever, EU/EEA, 2010–2014

Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Discussion

In 2014, the notification rate of WNF in humans in the EU decreased markedly compared with 2013.

Two countries (Hungary and Romania) have been reporting human cases for nine consecutive years, Italy for seven years, and Greece for five years. In Greece, the 2012 notification rate was higher than in 2011 and then decreased steadily in 2013–2014. However, in 2014, an increase in the proportion of neuroinvasive infections among the reported cases was recorded.

The affected areas in the north of Italy are some of the most densely populated in the country. However, in 2013 and 2014, provinces in the south of Italy were also affected. The regional units around Athens have been affected by WNF since 2011. However, the largest number of cases was reported in 2012 and 2013. The capital itself reported no cases in 2014. Every year, additional regional units in Greece reported affected areas.

In Romania, cases were reported from counties in the south-east and the centre of the country, as well as from the capital, Bucharest. In Hungary, cases were reported across the country; this was also the case 2012.

In all affected countries, except Italy, cases were also reported in the capitals, causing serious concerns about the safety of the blood supply. In addition, all countries reported that the geographic distribution of cases had expanded compared with 2011.

Although Spain reported no human cases in 2013 and 2014, several outbreaks were reported in horses in the provinces of Sevilla and Huelva in the south of the country [1]. These provinces are also close to the border with Portugal. Thus the risk of West Nile virus transmission to humans in both countries cannot be excluded.

Public health conclusions

Currently, no vaccine against West Nile virus (WNV) infection is available. The best method to reduce the rates of WNV infection is mosquito control at the municipality level, ideally with the full engagement of the community, including business partners that specialise in mosquito control. Possible interventions include the reduction of mosquito populations by controlling the number of breeding sites such as standing pools of water (e.g. old tires, buckets, unused swimming pools).

Between 2011 and 2013, 2 349 serum samples collected from healthy unvaccinated adult horses were tested in the Czech Republic. Five samples were positive for West Nile virus infection (and negative for tick-borne encephalitis). The WNV-positive horses were from five different administrative regions and did not have any travel history outside the country [2].

Several countries (e.g. Italy, Greece and Portugal) implemented mosquito surveillance schemes that monitor increased mosquito activity and focus on early virus detection [3].

An interactive atlas which shows the spatial distribution of West Nile fever cases in the EU and neighbouring countries is available on the ECDC website, complete with a weekly epidemiological update.

The first West Nile viruses identified in Europe belonged to lineage 1. In Europe, lineage 2 viruses were first reported in 2003 in birds [4], and more recently also in humans [5]. The presence of West Nile virus lineages 1 and 2 in Europe needs to be further monitored in order to better estimate the risk of spread in both affected and naïve areas in Europe [6].

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Annex

Table. West Nile fever, surveillance systems overview, 2014

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* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

Yellow fever

Reporting on 2014 data retrieved from TESSy* on 19 November 2015

Suggested citation: European Centre for Disease Prevention and Control. Annual Epidemiological Report 2016 – Yellow fever. [Internet]. Stockholm: ECDC; 2016 [cited YYYY Month DD]. Available from: http://ecdc.europa.eu/en/healthtopics/yellow-fever/Pages/Annual-epidemiological-report-2016.aspx

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Key facts

- In 2014, no cases of yellow fever were reported in EU/EEA countries.

Methods

Click here for a detailed description of the methods used to produce this annual report

- Data were obtained from 29 EU/EEA countries, with the exception of Liechtenstein and Iceland.

- 22 countries used the EU case definition, four countries used an alternative case definition, and three countries did not specify the definition they used.

- Surveillance is compulsory in 27 EU/EEA countries, comprehensive, and mostly passive (active in Belgium, the Czech Republic and Slovakia). Data reporting is case-based and at done the national level (Annex).

Epidemiology

No cases of yellow fever were reported in EU/EEA countries in 2014.

Discussion

Yellow fever is endemic in several countries in Africa and South America [1]. According to WHO, there are an estimated 200 000 cases of yellow fever, causing 30 000 deaths, worldwide each year, with 90% occurring in Africa. The yellow fever burden in Africa was estimated for the year 2013 as 130 000 cases with fever and jaundice or haemorrhage (95% CI 51 000–380 000), including 78 000 deaths (95% CI 19 000–180 000) [2].

In 2014, only 21 cases of yellow fever and 12 deaths were reported: the Democratic Republic of Congo reported two outbreaks involving seven cases, Brazil one case, and Peru reported 13 cases, including 12 deaths [3]. In 2013, 230 cases of yellow fever (including 85 deaths) were reported to WHO from four African countries (206 cases and 69 deaths, mainly from Ethiopia and Sudan, but also from the Democratic Republic of Congo and Cameroon) and from two countries in South America (23 cases and 15 deaths from Peru and Colombia) [4]. Large immunisation campaigns were carried out in the affected areas [4]. However, the capacity of these countries to implement vaccination campaigns is limited due to a worldwide shortage of vaccine supplies [3].

Public health conclusions

Vaccination is the most important preventive measure against yellow fever. The vaccine is safe, affordable and highly effective, and a single dose of yellow fever vaccine is sufficient to confer sustained immunity and lifelong protection against yellow fever disease. A booster dose of yellow fever vaccine is not needed. The vaccine provides effective immunity within 30 days for 99% of the vaccinated people [1].

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Additional information

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