

SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Tick-borne encephalitis

Key facts

- In 2016, 2 876 cases of tick-borne encephalitis were reported, 2 674 (93%) of which were confirmed.
- The notification rate in 2016 was 0.6 cases per 100 000 population.
- The age and gender distribution shows a significant predominance of cases in 45–64-year-olds and in males.
- Close to four-fifths of cases (78%) of tick-borne encephalitis occurred between June and September.

Methods

This report is based on data for 2016 retrieved from The European Surveillance System (TESSy) on 4 April 2018. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases.

For a detailed description of methods used to produce this report, please refer to the *Methods* chapter [1].

An overview of the national surveillance systems is available online [2].

A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [3].

This surveillance report is based on tick-borne encephalitis (TBE) surveillance data collected by the European Emerging and Vector-borne Disease Surveillance Network for 2016.

Twenty-five EU/EEA countries reported data on TBE. Seventeen countries used the EU case definition, two countries (Germany and Italy) reported using another case definition, and six countries did not specify which case definition was used (Croatia, Finland, Greece, Latvia, Luxembourg and Poland).

Eighteen reporting countries have a comprehensive surveillance system. Reporting is compulsory in 16 countries, voluntary in five (Belgium, France, Luxembourg, the Netherlands and the United Kingdom) and 'not specified' in four countries (Croatia, Greece, Latvia and Poland). Surveillance is mostly passive except in the Czech Republic, Slovakia and the United Kingdom, where active surveillance is in place. The disease surveillance method is not specified for five countries [2]. Data reporting is case based, except in Belgium and Croatia, which report aggregated data.

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Epidemiology

In 2016, 2 876 cases were reported to TESSy, 2 674 (93%) of which were confirmed (0.6 cases per 100 000 population, Table 1). Of 12 fatalities, 11 were in confirmed cases (CFR: 0.4%). Seven countries reported zero cases.

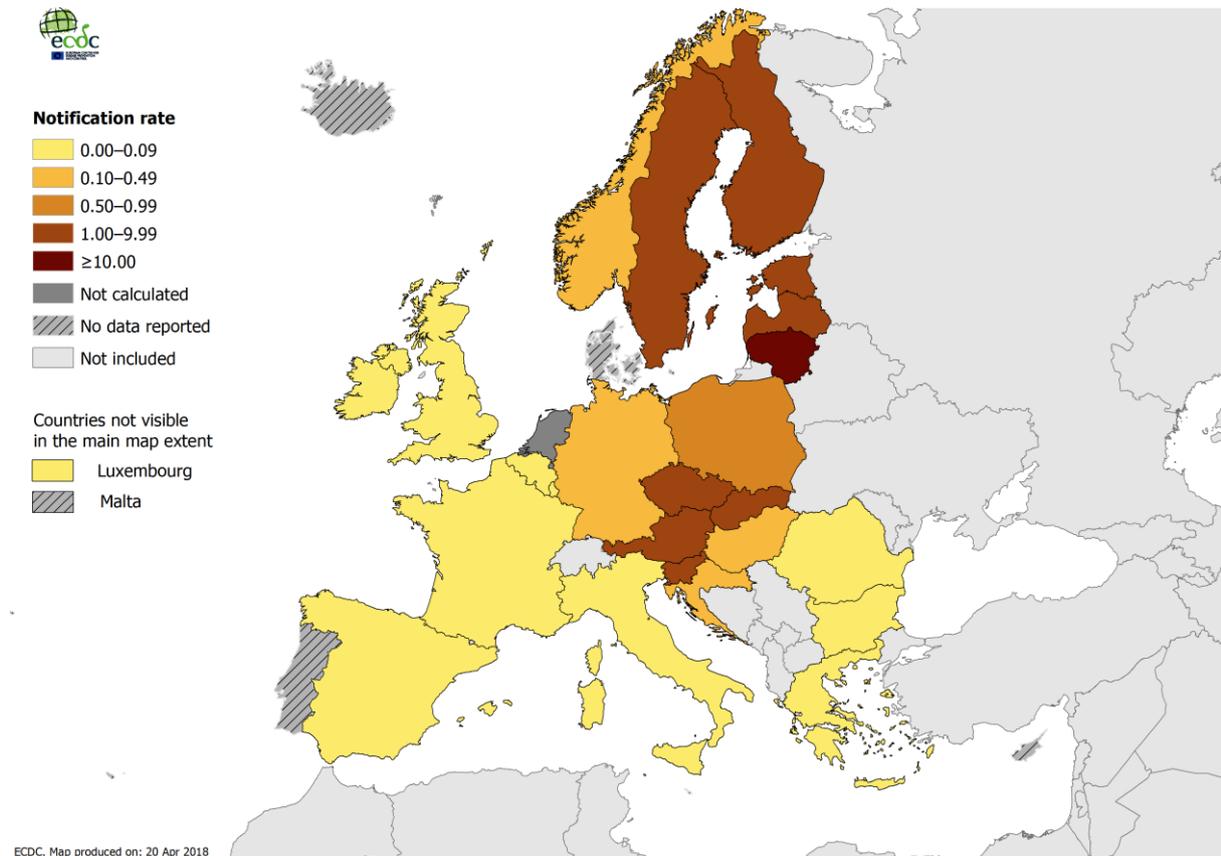
The notification rate was the highest in Lithuania (21.9 cases per 100 000 population), followed by Estonia (6.1) and the Czech Republic (5.4) (Table 1, Figure 1). The highest numbers of confirmed cases in 2016 were reported by Lithuania (n=633), the Czech Republic (n=565) and Germany (n=348) (Table 1).

The overall EU/EEA notification rate increased in 2016 compared with 2015 (0.4 cases per 100 000 population). Increases of over 40% in the notification rate were reported for the Czech Republic (62%), France (49%), Germany (57%), Italy (862%), Lithuania (91%), Poland (83%) and Slovakia (111%). Decreases in notification rates of 30% or more were mostly observed among countries that reported a lower number of cases (Croatia, Estonia, Hungary and Latvia).

Table 1. Distribution of confirmed tick-borne encephalitis cases by country and year, EU/EEA, 2012–2016

Country	2012		2013		2014		2015		2016			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Confirmed cases	Rate	ASR	Reported cases
Austria	38	0.5	100	1.2	81	1.0	79	0.9	95	1.1	1.1	95
Belgium	2	0.0	1	0.0	0	0.0	1	0.0	1	0.0	0.0	1
Bulgaria	-	-	-	-	0	0.0	2	0.0	0	0.0	0.0	0
Croatia	45	1.1	44	1.0	23	0.5	26	0.6	6	0.1	-	6
Cyprus	.	.	.	.	.	.	.	.	.	.	.	.
Czech Republic	573	5.5	625	5.9	410	3.9	349	3.3	565	5.4	5.3	565
Denmark	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	178	13.4	114	8.6	82	6.2	115	8.7	80	6.1	6.0	81
Finland	39	0.7	38	0.7	47	0.9	68	1.2	61	1.1	1.1	61
France	1	0.0	1	0.0	9	0.0	10	0.0	15	0.0	0.0	22
Germany	195	0.2	419	0.5	264	0.3	219	0.3	348	0.4	0.4	348
Greece	0	0.0	0	0.0	1	0.0	1	0.0	0	0.0	0.0	0
Hungary	42	0.4	27	0.3	26	0.3	22	0.2	14	0.1	0.1	19
Iceland	.	.	.	.	.	.	.	.	.	.	.	.
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Italy	-	-	0	0.0	0	0.0	5	0.0	48	0.1	0.1	48
Latvia	72	3.5	230	11.4	149	7.4	141	7.1	91	4.6	4.5	204
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	351	11.7	487	16.4	353	12.0	336	11.5	633	21.9	20.9	633
Luxembourg	-	-	-	-	0	0.0	1	0.2	0	0.0	0.0	0
Malta	.	.	.	.	.	.	.	.	.	.	.	.
Netherlands	-	-	-	-	-	-	-	-	4	-	-	4
Norway	7	0.1	6	0.1	13	0.3	9	0.2	12	0.2	0.2	12
Poland	119	0.3	136	0.4	131	0.3	115	0.3	211	0.6	0.5	283
Portugal	.	.	.	.	.	.	.	.	.	.	.	.
Romania	3	0.0	3	0.0	1	0.0	0	0.0	0	0.0	0.0	0
Slovakia	31	0.6	157	2.9	115	2.1	80	1.5	169	3.1	3.1	173
Slovenia	164	8.0	307	14.9	100	4.9	62	3.0	83	4.0	3.9	83
Spain	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Sweden	287	3.0	209	2.2	178	1.8	268	2.7	238	2.4	2.5	238
United Kingdom	3	0.0	0	0.0	2	0.0	0	0.0	0	0.0	0.0	0
EU/EEA	2150	0.5	2904	0.6	1985	0.4	1909	0.4	2674	0.6	0.5	2876

Figure 1. Distribution of confirmed tick-borne encephalitis cases per 100 000 population by country, EU/EEA, 2016

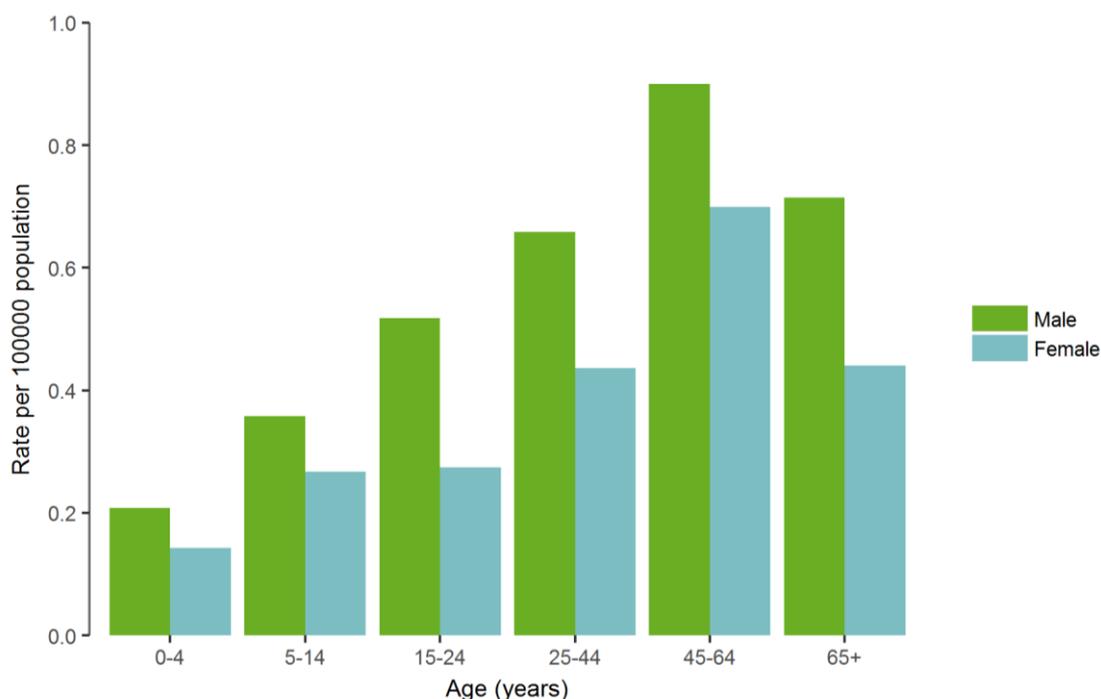


Source: Country reports from Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Age and gender distribution

The largest proportion of cases was reported in the age group 45–64 years ($n=1\,044$, 39%). The notification rate increased by age, with the lowest rate observed among children aged 0–4 years (0.2 cases per 100 000 population), peaking among persons aged 45–64 years (0.8 cases per 100 000 population) before decreasing slightly among persons aged 65 years or over (0.6 cases per 100 000 population). Cases were more frequently reported among men (58%), and the male-to-female ratio was 1.4:1. Rates were higher among men for all age groups (Figure 2).

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

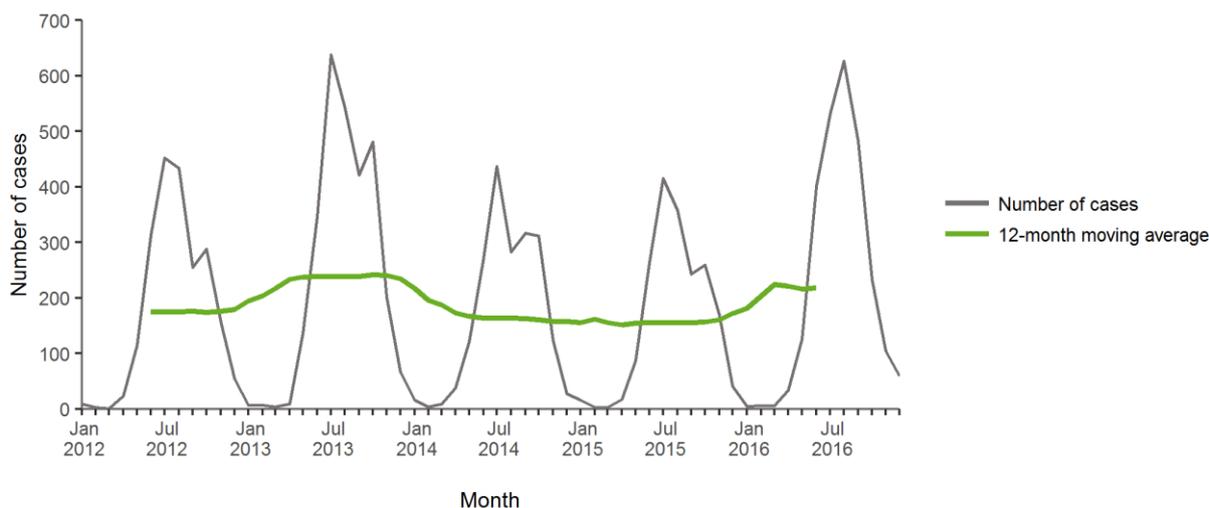


Source: Country reports from Austria, Belgium, Bulgaria, the Czech Republic, Estonia, Finland, France, Greece, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

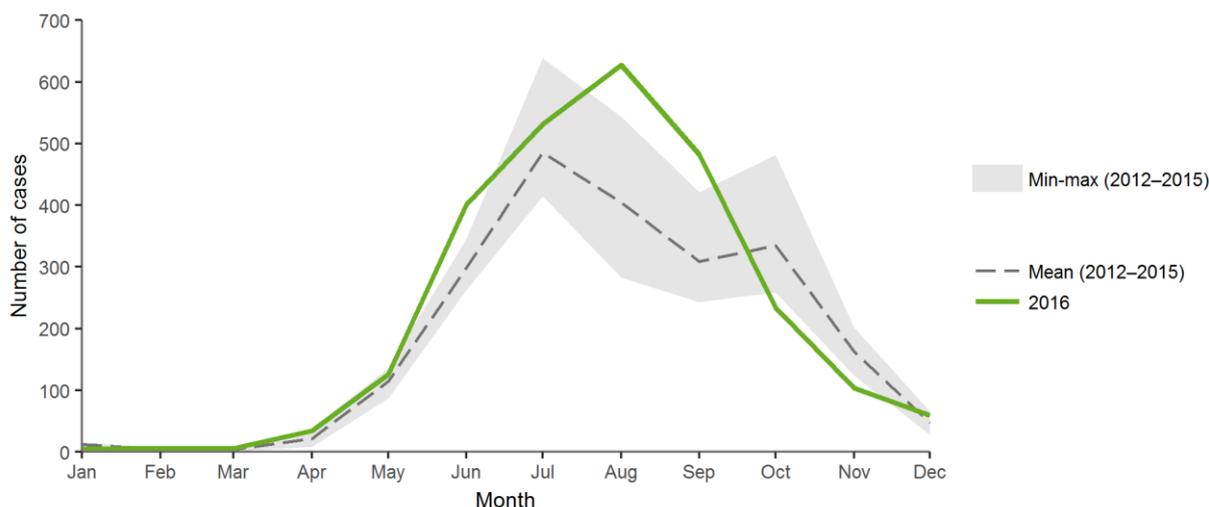
Seasonality

Most TBE cases (78%) were reported between June and September, with a peak in August; 92% were diagnosed between May and October (Figures 3 and 4). Among the 95% of cases where date of onset was reported, 21 were reported with onset in January, February, March or December. These cases were reported to be infected in the Czech Republic (6), Germany (8), Italy (1) and Lithuania (1). Austria and Slovenia also reported cases during these months, but the place of infection was not known for these cases.

Figure 3. Distribution of confirmed tick-borne encephalitis cases by month, EU/EEA, 2012–2016



Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Greece, Hungary, Latvia, Lithuania, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 4. Distribution of confirmed tick-borne encephalitis cases by month, EU/EEA, 2016 and 2012–2015

Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Greece, Hungary, Latvia, Lithuania, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Imported cases

Data on importation status were available for 2 515 confirmed cases, 1.4% (n=37) of which were travel associated. Imported cases were reported by 11 countries, with Germany reporting most imported cases (8 cases). Among imported cases with reported place of infection, cases originated in the Czech Republic (six cases), Latvia (five cases), Germany (three cases), Austria and Spain (two cases each), and France, Italy, Poland, Russia, Slovakia and Sweden (one case each).

Immunisation

Of the 1 550 confirmed cases for which information about immunisation status was available, 1 525 cases (98%) were reported as not vaccinated, and 25 (1.6%) had a history of previous immunisation. Of the immunised cases, 13 had two doses of a vaccine or more.

Discussion

Tick-borne encephalitis became notifiable in the EU in 2012. The number of reporting countries, including those reporting zero cases, increased from 19 in 2012 to 25 in 2016. In 2016, the Netherlands reported the first two autochthonous TBE cases following the first detections of Dutch *Ixodes ricinus* ticks which were RT-PCR positive for TBEV-Eu in June 2016 [4,5], highlighting the expansion of endemic areas seen in recent years [6].

The notification rate in 2016 increased by 50% compared with 2015 and reached the same level as 2013, with large increases reported in many countries in central Europe and the Baltic states. The overall increase appears to be consistent with a stable long-term trend in the EU/EEA, with increases in some years that are possibly related to favourable environmental conditions. The countries reporting the highest rates in 2016 were Lithuania, Estonia and the Czech Republic. This year also marked the first year that the Czech Republic was one of the three countries with the highest rates since EU-wide reporting commenced. In previous years, Estonia, Latvia and Lithuania (and occasionally Slovenia) were the countries that reported the highest rates in Europe. In 2016, Lithuania reported the highest TBE rate ever reported since surveillance at the European level was implemented; the rate was almost double the rate reported in 2015, an increase of 91%.

As in previous years, notification rates were higher among males and among adults aged between 45 and 64 years, possibly due to higher exposure to outdoors activities (e.g. berry picking) [7]. The majority of cases continue to be diagnosed during the warmer months, with no evidence of a changing seasonality [8,9].

Public health conclusions

People who live in, or travel to, regions where tick-borne encephalitis is endemic should be aware of the risk of exposure to ticks, protect themselves against tick bites and consider immunisation prior to exposure, which offers the most effective protection. The collected data support the effectiveness of TBE vaccination: only 1.6% of the reported cases were in immunised people.

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