



# Echinococcosis

## Annual Epidemiological Report for 2017

### Key facts

- In 2017, 832 confirmed echinococcosis cases were reported in the EU/EEA. Of these, 412 cases were reported as *Echinococcus granulosus*, 146 as *Echinococcus multilocularis*, and 274 as unknown species.
- The EU/EEA notification rate of echinococcosis was 0.18 cases per 100 000 population.
- The highest notification rate in males was reported in those 45–64 years of age, in females among those 25–44 and  $\geq 65$  years of age.

### Methods

This report is based on data for 2017 retrieved from The European Surveillance System (TESSy) on 11 December 2018. The European Surveillance System 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].

Twenty-four countries reported echinococcosis cases using the 2008 or 2012 EU case definitions, which are identical. One country used the 2002 case definition and three countries used other/unspecified definitions. Echinococcosis is under mandatory surveillance in 24 EU/EEA countries. Surveillance is voluntary in three Member States (Belgium, the Netherlands and the United Kingdom). For France, the type of reporting system is not specified [2]. Denmark and Italy have no surveillance system in place for echinococcosis. The surveillance systems for echinococcosis have full national coverage in all EU Member States, Iceland and Norway, except in France. In Belgium, full national coverage was established in 2015 and rates before this date are not displayed. The majority of reporting countries provide case-based data except Belgium, Bulgaria and the Netherlands, which report aggregate data. Both reporting formats were included to calculate numbers of cases, notification rates, disease trends, and age and gender distributions.

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## Epidemiology

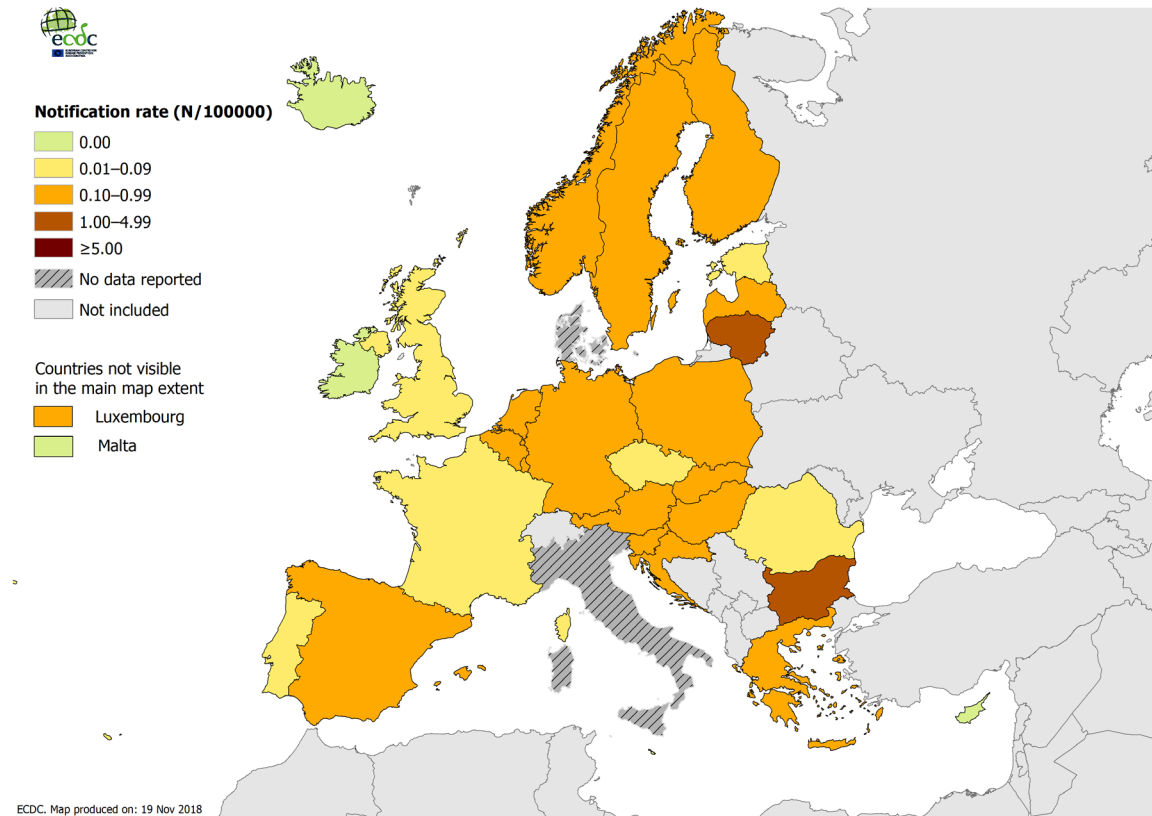
For 2017, 28 EU/EEA countries reported data on echinococcosis, with four countries reporting zero cases and 24 countries reporting 832 confirmed cases (Table 1). The highest number of cases was reported by Bulgaria, accounting for 26% of all reported cases, followed by Germany (15%), Spain (10%) and Poland (9%). One death was reported in Lithuania. The EU/EEA notification rate in 2017 was 0.18 confirmed echinococcosis cases per 100 000 population, which was in the same range as in the previous four years. The highest notification rate was observed in Bulgaria, followed by Lithuania and Austria (Table 1, Figure 1). In Bulgaria, the notification rate has decreased since the reporting to ECDC started in 2007. This reduction is attributable to measures implemented as part of a national control programme for echinococcosis in humans and animals carried out 2004–2008 and to the considerable reduction of stray dogs (A. Kurchatova, National Centre of Infectious and Parasitic Diseases, Sofia, personal communication, 27 July, 2018). The notification rate in Austria continued to increase in 2017, almost doubling from 2016, after already increasing by more than 200% from 2015 to 2016, which was due to an intensified surveillance together with a higher proportion of samples sent to the reference laboratory for confirmation (C. Kornschober, AGES, Vienna, personal communication, 26 July 2017). In Lithuania, the increase in 2017 was thought to be due to improved diagnostics (G. Zagrebneviene, Centre for Communicable Diseases and AIDS, Vilnius, personal communication 10 July, 2018).

**Table 1. Distribution of confirmed echinococcosis cases and rates per 100 000 population by country, EU/EEA, 2013–2017**

Country	2013		2014		2015		2016		2017			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Confirmed cases	Rate	ASR	Reported cases
Austria	11	0.13	14	0.16	8	0.09	26	0.30	50	0.57	0.57	50
Belgium	15	-	15	-	9	0.08	17	0.15	12	0.11	-	12
Bulgaria	278	3.82	302	4.17	313	4.35	269	3.76	218	3.07	3.19	218
Croatia	0	0.00	20	0.47	7	0.17	9	0.21	15	0.36	0.34	15
Cyprus	0	0.00	0	0.00	2	0.24	0	0.00	0	0.00	0.00	0
Czech Republic	2	0.02	6	0.06	3	0.03	4	0.04	1	0.01	0.01	1
Denmark	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	3	0.23	1	0.08	0	0.00	0	0.00	1	0.08	0.08	1
Finland	4	0.07	0	0.00	2	0.04	4	0.07	5	0.09	0.10	5
France	34	0.05	32	0.05	48	0.07	38	0.06	48	0.07	0.07	48
Germany	132	0.16	131	0.16	157	0.19	177	0.22	123	0.15	0.16	123
Greece	10	0.09	13	0.12	13	0.12	18	0.17	15	0.14	0.13	15
Hungary	5	0.05	2	0.02	2	0.02	5	0.05	14	0.14	0.13	14
Iceland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Ireland	1	0.02	0	0.00	0	0.00	2	0.04	0	0.00	0.00	0
Italy	.	.	.	.	.	.	.	.	.	.	.	.
Latvia	7	0.35	13	0.65	10	0.50	11	0.56	6	0.31	0.29	6
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	23	0.77	22	0.75	33	1.13	26	0.90	53	1.86	1.71	53
Luxembourg	0	0.00	0	0.00	0	0.00	0	0.00	2	0.34	0.36	2
Malta	0	0.00	0	0.00	0	0.00	1	0.22	0	0.00	0.00	0
Netherlands	33	0.20	37	0.22	64	0.38	33	0.19	38	0.22	0.23	38
Norway	2	0.04	0	0.00	2	0.04	3	0.06	5	0.10	0.10	5
Poland	39	0.10	48	0.13	47	0.12	64	0.17	75	0.20	0.19	75
Portugal	3	0.03	4	0.04	4	0.04	2	0.02	2	0.02	0.02	2
Romania	55	0.27	31	0.16	18	0.09	13	0.07	14	0.07	0.07	14
Slovakia	20	0.37	8	0.15	5	0.09	4	0.07	7	0.13	0.12	7
Slovenia	6	0.29	5	0.24	7	0.34	3	0.15	7	0.34	0.34	7
Spain	94	0.20	70	0.15	83	0.18	87	0.19	83	0.18	0.17	83
Sweden	16	0.17	21	0.22	26	0.27	27	0.27	34	0.34	0.36	34
United Kingdom	14	0.02	25	0.04	26	0.04	.	.	4	0.01	0.01	4
<b>EU/EEA</b>	<b>807</b>	<b>0.18</b>	<b>820</b>	<b>0.19</b>	<b>889</b>	<b>0.20</b>	<b>843</b>	<b>0.22</b>	<b>832</b>	<b>0.18</b>	<b>0.18</b>	<b>832</b>

∴ No report, - : rate not calculated, ASR: age-standardised rate

**Figure 1. Distribution of confirmed echinococcosis cases per 100 000 population by country, EU/EEA, 2017**

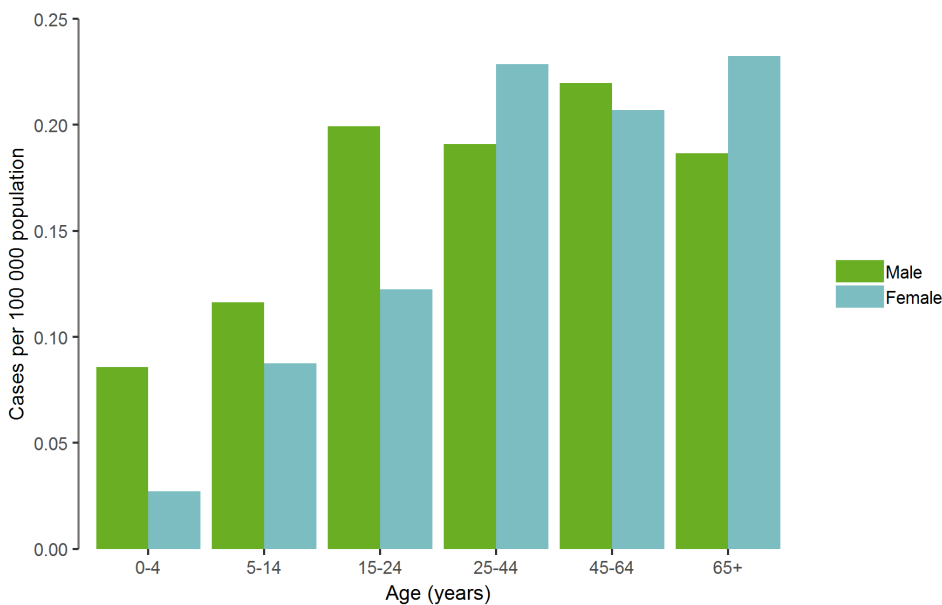


Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

The notification rate in males was highest among persons 45–64 years of age, in females among persons 25–44 and ≥ 65 years of age. The male-to-female ratio was 0.9:1.

Of cases with known importation status (n=323), 41% were reported to have been infected outside of the reporting country in 2017. This proportion was 41–50% in the period 2014–2017 compared with 19–27% in the previous four-year period, 2010–2013.

**Figure 2. Distribution of confirmed echinococcosis cases per 100 000 population, by age and gender, EU/EEA, 2017**



## Echinococcosis by species

Species information was known for 67% of confirmed cases from 15 countries (information from Bulgaria received via e-mail due to aggregate reporting and included in the results by species).

### Echinococcus granulosus

Fourteen countries reported 412 confirmed cases of *E. granulosus* sensu lato (s.l.) (cystic echinococcosis) in 2017 (Table 2). This was an 11% decrease compared with 2016, when 465 confirmed cases were reported. Bulgaria accounted for 53% of the cases in 2017 and Germany for 18%. The majority (35%) of cystic echinococcosis cases in EU countries in 2017 was observed in the age group 25–44 years, followed by the age group 45–64 years (25%). There were slightly more cases in males than in females (219 vs 193). In the five-year period 2013–2017, there was a significantly increasing trend of *E. granulosus* in the EU/EEA as a whole [4]. Increasing country-specific trends were observed in Austria, Germany, Lithuania and Poland, and decreasing trends in Slovakia and Spain. The proportion of cases reported to have been infected outside of the reporting country decreased from 80% in the peak year of 2015 to 60% in 2017 (aggregate data not included).

### Echinococcus multilocularis

Nine countries reported 146 cases of *E. multilocularis* (alveolar echinococcosis) in 2017 (Table 2). This represents a 25% increase in reported cases compared with 2016 when eight countries reported 117 confirmed *E. multilocularis* cases. France, Germany and Poland accounted for 75% of the reported *E. multilocularis* cases in the EU in 2017. Most cases were reported in the age group 45–64 years (40%) and ≥ 65 years of age (35%). In 2017, 60% of the reported *E. multilocularis* cases were females. In the five-year period 2013–2017, the number of *E. multilocularis* infections was stable in the EU/EEA overall and by country [4]. In 2017, similar to previous years, 90% of cases with *E. multilocularis* were reported to have been infected within the reporting country.

**Table 2. Confirmed echinococcosis cases, by species, EU/EEA, 2016–2017**

Country	Confirmed echinococcosis cases		<i>E. granulosus</i>		<i>E. multilocularis</i>		Species unknown/not reported	
	2016	2017	2016	2017	2016	2017	2016	2017
Austria	26	50	22	37	4	8	0	5
Belgium	17	12	–	–	–	–	17	12
Bulgaria	269	218	269	218	0	0	0	0
Croatia	9	15	–	–	–	–	9	15
Cyprus	0	0	0	0	0	0	0	0
Czech Republic	4	1	–	–	–	–	4	1
Estonia	0	1	0	0	0	1	0	0
Finland	4	5	4	5	0	0	0	0
France	38	48	0	0	38	48	0	0
Germany	177	123	119	75	39	30	19	18
Greece	18	15	–	–	–	–	18	15
Hungary	5	14	–	1	–	1	5	12
Iceland	0	0	0	0	0	0	0	0
Ireland	2	0	1	0	–	0	1	0
Latvia	11	6	1	4	1	–	9	2
Lithuania	26	53	5	19	10	20	11	14
Luxembourg	0	2	0	2	0	0	0	0
Malta	1	0	1	0	0	0	0	0
Netherlands	33	38	–	–	–	–	33	38
Norway	3	5	1	3	–	–	2	2
Poland	64	75	18	27	22	31	24	17
Portugal	2	2	2	–	0	–	0	2
Romania	13	14	–	–	–	–	13	14
Slovakia	4	7	1	2	2	3	1	2
Slovenia	3	7	–	–	–	–	3	7
Spain	87	83	1	4	–	–	86	79
Sweden	27	34	20	11	1	4	6	19
United Kingdom	–	4	–	4	–	0	–	0
EU/EEA	843	832	465	412	117	146	261	274

– No data reported

## Discussion

Echinococcosis is a rare disease in the EU/EEA. However, it is under-reported as recently illustrated in Spain [5], Bulgaria and Romania [6]. In a cross-sectional ultrasound screening survey of people in rural areas in Bulgaria, Romania and Turkey, the prevalence of abdominal cystic echinococcosis was 0.41% in Bulgaria and Romania and 0.59% in Turkey [6]. Bulgaria accounted for 26% of all confirmed echinococcosis cases reported to ECDC in 2017 (and for 53% of the *E. granulosus* cases), Romania only for 2%.

The distribution of the two forms of disease differs in different parts of the EU/EEA. *E. multilocularis* is endemic in the fox population in central Europe [4,7] and human cases of alveolar echinococcosis are only reported by these countries, with the majority of cases considered to be infected within the country. *E. granulosus* s.l., on the other hand, is mainly prevalent in intermediate hosts in southern and southeastern Europe and is a major public health issue in many countries in the Balkan region [4,7], while in Northern and Western Europe, most cases are imported.

Due to the long incubation period and passive disease surveillance, echinococcosis is more likely to be reported in adults and the elderly. The long incubation period and challenges in diagnostics, especially in remote areas, make it difficult to identify a seasonal pattern or multiannual trend. The infection may have occurred during childhood, which is why the epidemiology of the disease should be taken into account when designing screening and/or education programmes. The EU-funded initiative HERACLES sheds more light on echinococcosis in Europe by performing mass screening programmes, setting up a European registry of cystic echinococcosis cases, and researching for diagnostics developments [8].

The general trend of echinococcosis provides limited information for public health action, since the two diseases require different prevention and control strategies. Therefore, speciation in diagnosed cases is essential. Eleven of 28 reporting countries in 2017, however, did not report species for any or only for a minority of their confirmed cases. Based on the species information available, there was a significantly increasing trend in the EU/EEA in 2013–2017 for infections with cystic echinococcosis (*E. granulosus* s.l.) while the trend for alveolar echinococcosis (*E. multilocularis*) infections was stable in the same period [4]. Molecular typing has further provided possibilities for separating *E. granulosus* into 11 different genotypes and some new species (hence the term *sensu lato*, meaning 'in the broad sense') [10]. This differentiation could further improve the understanding of transmission patterns in different parts of the EU/EEA.

## Public health implications

Reporting of echinococcosis cases should include species information and preferably data collected at the NUTS-2 or NUTS-3 level. This would allow for a more complete monitoring of cases, foster a better understanding of the epidemiology of these diseases, improve monitoring of spatial and temporal trends, and ultimately enable the design and evaluation of targeted prevention and control actions.

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