



SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Echinococcosis

Key facts

- In 2016, 775 confirmed echinococcosis cases were reported in the EU/EEA. Of these, 414 cases were reported as *Echinococcus granulosus*, 104 as *Echinococcus multilocularis* and 257 as unknown species.
- The EU/EEA notification rate of echinococcosis was 0.20 cases per 100 000 population.
- The highest notification rate in males was reported for those over 64 years of age and females 25–44 years of age.

Methods

This report is based on data for 2016 retrieved from The European Surveillance System (TESSy) on 27 November 2017. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases. 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-three countries reported echinococcosis cases using the 2008 or 2012 EU case definitions, which are identical. One country reported in accordance with the 2002 EU case definition and three used other/unspecified definitions. Echinococcosis is under mandatory surveillance in 24 EU/EEA countries. Surveillance is voluntary in Belgium and the Netherlands, while in France, the type of reporting system is not specified [2]. Denmark and Italy have no surveillance system for echinococcosis. The United Kingdom did not report data for 2016.

Epidemiology

In 2016, 27 EU/EEA countries reported data on echinococcosis, with four countries reporting no cases and 23 countries reporting 775 confirmed echinococcosis cases. The highest number of cases was reported by Bulgaria, accounting for 35% of all reported cases, followed by Germany (17%) and Spain (11%). One death was reported in Latvia due to *E. granulosus*. There was a marked decrease in the reported number of cases in the EU/EEA from

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2015 to 2016. This was mainly due to the UK not reporting data in 2016 and certain countries that observed an increase in cases in 2015, including Germany and the Netherlands, reporting lower numbers again in 2016.

Table 1. Distribution of confirmed echinococcosis cases, EU/EEA, 2012 to 2016

Country	2012		2013		2014		2015		2016			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Confirmed cases	Rate	ASR	Reported cases
Austria	3	0.04	11	0.13	14	0.16	8	0.09	26	0.30	0.31	26
Belgium	6	0.05	15	0.13	15	0.13	9	0.08	17	0.15	-	17
Bulgaria	320	4.37	278	3.82	302	4.17	313	4.35	269	3.76	3.79	269
Croatia	0	0.00	0	0.00	20	0.47	7	0.17	9	0.21	0.19	11
Cyprus	0	0.00	0	0.00	0	0.00	2	0.24	0	0.00	0.00	0
Czech Republic	0	0.00	2	0.02	6	0.06	3	0.03	4	0.04	0.04	4
Denmark	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	3	0.23	3	0.23	1	0.08	0	0.00	0	0.00	0.00	0
Finland	3	0.06	4	0.07	0	0.00	2	0.04	4	0.07	0.08	4
France	49	0.08	34	0.05	32	0.05	48	0.07	38	0.06	0.06	38
Germany	119	0.15	132	0.16	131	0.16	156	0.19	109	0.13	0.14	109
Greece	21	0.19	10	0.09	13	0.12	13	0.12	18	0.17	0.17	18
Hungary	6	0.06	5	0.05	2	0.02	2	0.02	5	0.05	0.05	5
Iceland	.	.	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Ireland	0	0.00	1	0.02	0	0.00	0	0.00	2	0.04	0.04	2
Italy	.	.	.	.	.	.	.	.	.	.	.	.
Latvia	8	0.39	7	0.35	13	0.65	10	0.50	11	0.56	0.54	11
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	23	0.77	23	0.77	22	0.75	33	1.13	26	0.90	0.85	26
Luxembourg	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Malta	0	0.00	0	0.00	0	0.00	0	0.00	1	0.23	0.23	1
Netherlands	50	0.30	33	0.20	37	0.22	64	0.38	33	0.19	0.20	33
Norway	2	0.04	2	0.04	0	0.00	2	0.04	3	0.06	0.06	3
Poland	28	0.07	39	0.10	48	0.13	47	0.12	64	0.17	0.16	64
Portugal	2	0.02	3	0.03	4	0.04	4	0.04	2	0.02	0.02	2
Romania	96	0.48	55	0.27	31	0.16	18	0.09	13	0.07	0.07	13
Slovakia	3	0.06	20	0.37	8	0.15	5	0.09	4	0.07	0.07	4
Slovenia	6	0.29	6	0.29	5	0.24	7	0.34	3	0.15	0.13	3
Spain	96	0.21	94	0.20	70	0.15	83	0.18	87	0.19	0.18	87
Sweden	16	0.17	16	0.17	21	0.22	26	0.27	27	0.27	0.30	27
United Kingdom	7	0.01	14	0.02	25	0.04	26	0.04	.	.	.	.
EU/EEA	867	0.20	807	0.18	820	0.18	888	0.20	775	0.20	0.20	777

Source: country reports.

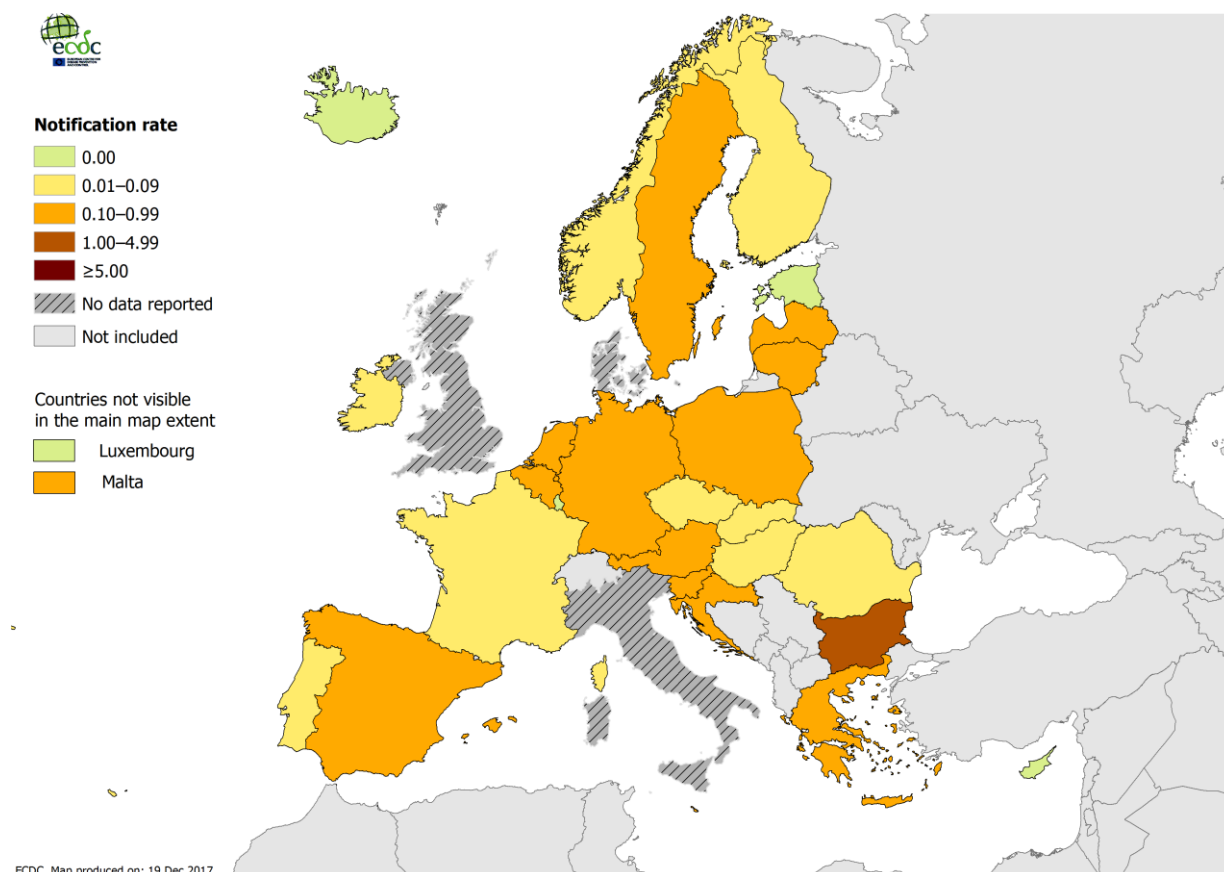
ASR: age-standardised rate

..: no data reported

-.: no rate calculated due to aggregated data without age information.

The EU/EEA notification rate in 2016 was 0.20 confirmed echinococcosis cases per 100 000 population, which was at the same level as in the previous four years (Table 1). The highest notification rate was observed in Bulgaria, with 3.76 cases per 100 000 population, followed by Lithuania and Latvia, with 0.90 and 0.54 cases per 100 000 population respectively (Figure 1). Austria observed a more than threefold increase in the notification rate from 2015 to 2016. The increase was due to intensified surveillance together with a higher proportion of samples sent to the reference laboratory for confirmation (C. Kornschöber, AGES, personal communication, 26 July 2017).

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

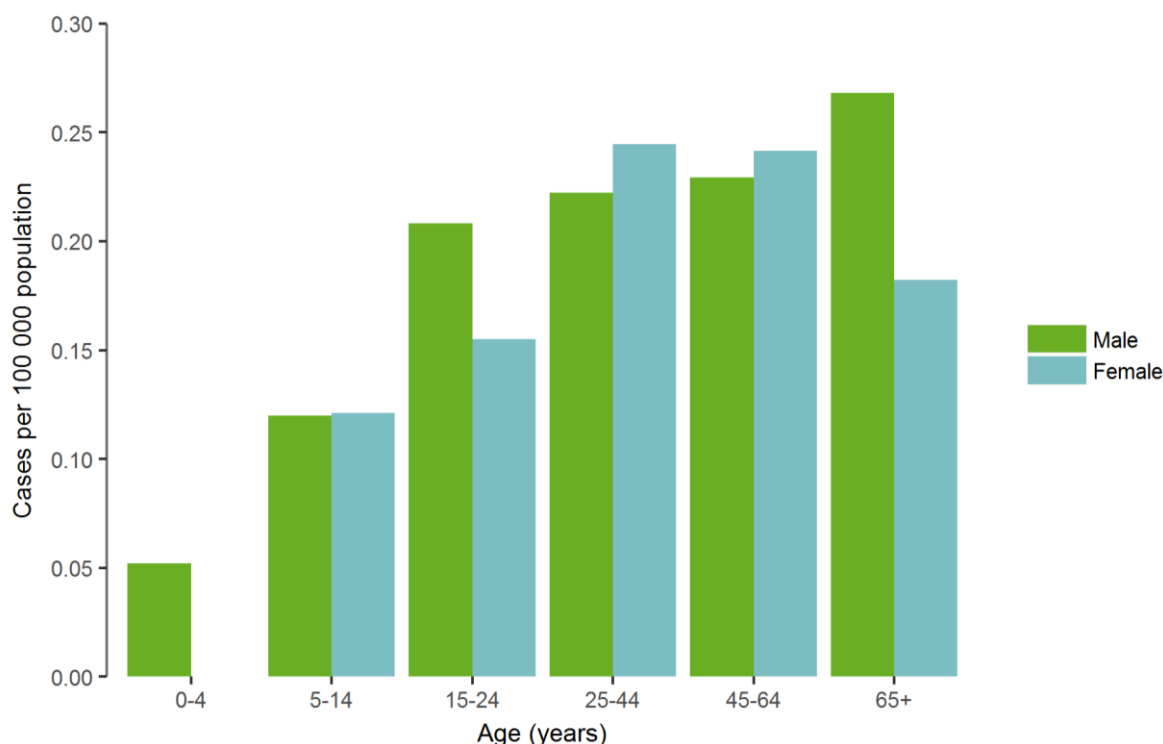


Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

The notification rate in males was highest among persons ≥ 65 years of age and females 25–44 years of age. The male-to-female ratio was 1.1:1.

Of cases with known importation status ($n=226$), 46% were reported to have been infected outside of the reporting country in 2016. This proportion was 43–50% in the period from 2014 to 2016 compared with 19–27% in the previous three-year period from 2011 to 2013. Syria was the most common probable country of infection in 2016, accounting for 14 of 39 imported cases with information on country provided, while in the previous four years, it was Iraq. The probable country of infection was reported for only 29% of imported cases.

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



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 results by species).

Echinococcus granulosus

Fourteen countries reported 416 confirmed cases of *E. granulosus* (cystic echinococcosis) in 2016 (Table 2). This was a 12% decrease compared with 2015, when 474 confirmed *E. granulosus* cases were reported. Part of the decrease could be explained by the UK not reporting data in 2016 after reporting 26 *E. granulosus* cases in 2015. Bulgaria accounted for 65% of the cases in 2016 and Germany 17%. The largest proportional increase was observed in Austria, where 22 cases were reported in 2016 compared with two in 2015. Similar to 2015, the majority of cystic echinococcosis cases in EU countries was observed in the age group 25–44 years (43%), followed by the age group 45–64 years (25%). Cases were equally distributed by gender. From 2008 to 2016, there was a significantly decreasing trend of *E. granulosus* in the EU/EEA, but the trend did not show any significant increase or decrease in 2012 to 2016. Please refer to the 2016 EU summary report on zoonoses for trend graphs, trends by country, and information on *E. granulosus* in animals [4]. From 2014 to 2016, 70–81% of cases with *E. granulosus* were reported to have been infected outside of the reporting country (data reported in aggregated format not included).

Echinococcus multilocularis

Eight countries reported 104 cases of *E. multilocularis* (alveolar echinococcosis) in 2016 (Table 2). This represents a 25% decrease in reported cases compared with 2015 when six countries reported 139 confirmed *E. multilocularis* cases. The number of cases in 2015 was, however the highest ever reported to TESSy. France, Germany and Poland accounted for 83% of the reported *E. multilocularis* cases in the EU in 2016. Most cases of alveolar echinococcosis were reported in the age group 45–64 years (38%) and ≥ 65 years of age (35%). In 2016, 57% of the reported *E. multilocularis* cases were males. In the years 2008–2016, there was a significantly increasing trend of *E. multilocularis* in the EU/EEA but the trend stabilised in 2012–2016. Please refer to the 2016 EU summary report on zoonoses for additional information on *E. multilocularis* [4]. From 2014 to 2016, 7–12% of cases with *E. multilocularis* were reported to have been infected outside the reporting country.

Table 2. Reported confirmed echinococcosis cases, by species, EU/EEA, 2015 to 2016

Country	Confirmed echinococcosis cases		<i>E. granulosus</i>		<i>E. multilocularis</i>		Species unknown/ not reported	
	2015	2016	2015	2016	2015	2016	2015	2016
Austria	8	26	2	22	3	4	3	0
Belgium	9	17	.	.	.	.	9	17
Bulgaria	313	269	313	269	0	0	0	0
Croatia	7	9	.	.	.	.	7	9
Cyprus	2	0	.	0	.	0	2	0
Czech Republic	3	4	.	.	.	.	3	4
Estonia	0	0	0	0	0	0	0	0
Finland	2	4	.	4	.	0	2	0
France	48	38	0	0	48	38	0	0
Germany	156	109	84	70	48	26	24	13
Greece	13	18	.	.	.	.	13	18
Hungary	2	5	.	.	.	.	2	5
Iceland	0	0	0	0	0	0	0	0
Ireland	0	2	0	1	0	.	0	1
Latvia	10	11	2	1	.	1	8	9
Lithuania	33	26	9	5	11	10	13	11
Luxembourg	0	0	0	0	0	0	0	0
Malta	0	1	0	1	0	0	0	0
Netherlands	64	33	.	.	.	.	64	33
Norway	2	3	1	1	.	.	1	2
Poland	47	64	9	18	26	22	12	24
Portugal	4	2	1	2	.	0	3	0
Romania	18	13	2	.	.	.	16	13
Slovakia	5	4	2	1	3	2	0	1
Slovenia	7	3	.	.	.	.	7	3
Spain	83	87	4	1	.	.	79	86
Sweden	26	27	19	20	.	1	7	6
United Kingdom	26	.	26	.	0	.	0	.
EU/EEA	888	775	474	416	139	104	195	196

∴ 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-based screening survey of people in rural areas in Bulgaria, Romania and Turkey, the prevalence of abdominal cystic echinococcosis was 0.41% in both Bulgaria and Romania and 0.59% in Turkey [6]. Bulgaria accounted for 35% of all confirmed echinococcosis cases reported to TESSy in 2016 (and 65% of the *E. granulosus* cases), while Romania only 2%.

Of the cases infected outside of the reporting country in 2016, Syria was the most common probable country of infection. This most likely reflects the high influx of Syrian refugees into the EU/EEA in 2015. In addition to the 14 cases (13 confirmed with *E. granulosus*) reported by four Member States, Germany (which did not provide information on probable country of infection to TESSy) reported 11 cases of cystic echinococcosis from Syria in their national statistics for 2016 [7]. Cystic echinococcosis appears endemic in Syria, although no prevalence data are currently available [8].

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 multi-annual trend. The infection may have occurred in childhood, which is why the epidemiology of the disease should be taken into account when designing screening and/or education

programmes. Mass screening programmes, registration of cases and diagnostic developments may shed more light on echinococcosis in Europe. The results of EU-funded initiatives such as HERACLES are particularly promising [9].

Since less than half of the countries reporting echinococcosis provided species information for the majority of cases, it is difficult to draw conclusions about the trends for the two types of echinococcosis, cystic and alveolar. The general trend of echinococcosis gives limited information for public health action, since the two diseases require different prevention and control strategies. Speciation in diagnosed cases is therefore essential. Based on the species information available, there was a significantly decreasing trend in the EU/EEA from 2008 to 2016 for infections with *E. granulosus* and a significantly increasing trend for infections with *E. multilocularis*. However, both trends have stabilised in recent years [4]. Molecular typing has further provided possibilities for separating *E. granulosus* into 11 different genotypes and certain new species [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 lead to the evaluation and design of targeted prevention and control actions.

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