



## SURVEILLANCE REPORT

Annual Epidemiological Report for 2017

# Trichinellosis

### Key facts

- Trichinellosis is a rare but serious disease in the EU/EEA.
- For 2017, 15 EU/EEA countries reported 224 cases of trichinellosis, of which 168 cases were confirmed.
- Bulgaria, Croatia and Romania accounted for 73.8% of confirmed cases.
- The overall EU/EEA notification rate was 0.03 cases per 100 000 population in 2017.
- Consumption of undercooked meat from pigs raised under non-controlled housing conditions or hunted wild boar constitutes the highest risk for acquiring trichinellosis in the EU/EEA.

### Methods

This report is based on data for 2017 retrieved from The European Surveillance System (TESSy) on 11 September 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, 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-nine countries reported data for 2017, fourteen of which reported no cases. Twenty-two countries reported data according to current EU case definition for trichinellosis as published in 2008 and 2012 and Luxembourg used the 2002 case definition. France, Germany, Italy and the United Kingdom used another definition and Belgium and Finland did not specify the definition used.

Twenty-six countries had a compulsory notification system and Belgium, France and the United Kingdom used a voluntary system. All countries had comprehensive surveillance of trichinellosis except Belgium, which used a sentinel system. No surveillance system for trichinellosis exists in Denmark [3].

Surveillance systems for trichinellosis had national coverage in all Member States except Belgium.

Eighteen countries have surveillance systems that integrate laboratory and epidemiological data from physicians or hospitals.

## Epidemiology

For 2017, 15 EU/EEA countries reported 224 cases of trichinellosis, of which 168 were confirmed and 56 were probable (Table 1). The EU/EEA notification rate was 0.03 cases per 100 000 population.

Bulgaria, Croatia and Romania accounted for 73.8% of confirmed cases. Bulgaria reported the highest notification rate in the EU/EEA (0.77 cases per 100 000 population), followed by Croatia (0.51), Lithuania (0.32) and Romania (0.24; Table 1, Figure 1).

Compared with 2016, notification rates increased in nine countries. A decrease was reported in Spain and Sweden. Portugal reported the first trichinellosis case since the beginning of EU-level surveillance in 2007 and Greece reported the first case since 2010.

Of the 91 confirmed cases with available information, 84.6% were domestically acquired. Five countries reported 14 trichinellosis cases as travel-related: two were associated with travel outside the EU/EEA, four with travel within the EU/EEA and eight with unknown travel destinations.

**Table 1. Distribution of confirmed trichinellosis cases and rates per 100 000 population by year and 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	0	0.00	0	0.00	0	0.00	2	0.02	3	0.03	0.03	3
Belgium	1	-	16	-	0	-	0	-	0	-	-	2
Bulgaria	36	0.49	60	0.83	22	0.31	35	0.49	55	0.77	0.82	55
Croatia	0	0.00	3	0.07	3	0.07	5	0.12	21	0.51	0.54	37
Cyprus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Czech Republic	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Denmark	.	-	.	-	.	-	.	-	.	-	-	.
Estonia	0	0.00	0	0.00	2	0.15	0	0.00	0	0.00	0.00	0
Finland	0	0.00	0	0.00	1	0.02	0	0.00	0	0.00	0.00	0
France	0	0.00	0	0.00	3	0.00	3	0.00	8	0.01	0.01	8
Germany	14	0.02	1	0.00	3	0.00	4	0.00	2	0.00	0.00	2
Greece	0	0.00	0	0.00	0	0.00	0	0.00	1	0.01	0.01	1
Hungary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Iceland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Ireland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Italy	0	0.00	4	0.01	36	0.06	5	0.01	4	0.01	0.01	4
Latvia	11	0.54	5	0.25	4	0.20	1	0.05	1	0.05	0.05	1
Liechtenstein	.	-	.	-	.	-	.	-	.	-	-	.
Lithuania	6	0.20	5	0.17	21	0.72	1	0.03	9	0.32	0.34	9
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	0	0.00	0.00	0
Netherlands	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Norway	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Poland	4	0.01	6	0.02	1	0.00	4	0.01	9	0.02	0.02	9
Portugal	0	0.00	0	0.00	0	0.00	0	0.00	1	0.01	0.01	1
Romania	116	0.58	221	1.11	55	0.28	26	0.13	48	0.24	0.25	86
Slovakia	5	0.09	0	0.00	1	0.02	1	0.02	1	0.02	0.02	1
Slovenia	1	0.05	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Spain	23	0.05	1	0.00	3	0.01	12	0.03	5	0.01	0.01	5
Sweden	0	0.00	1	0.01	1	0.01	2	0.02	0	0.00	0.00	0
United Kingdom	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0.00	0
<b>EU/EEA</b>	<b>217</b>	<b>0.04</b>	<b>324</b>	<b>0.06</b>	<b>156</b>	<b>0.03</b>	<b>101</b>	<b>0.02</b>	<b>168</b>	<b>0.03</b>	<b>0.03</b>	<b>224</b>

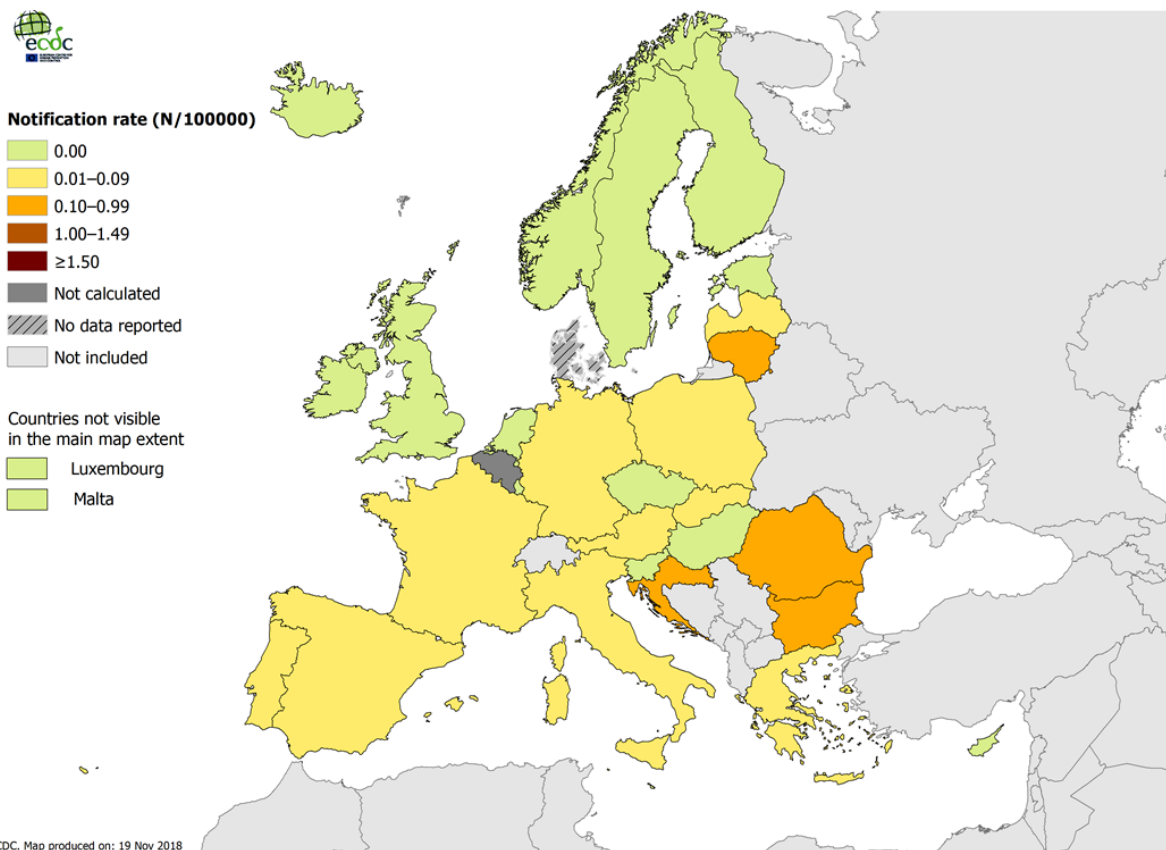
Source: country reports.

∴: no data reported

-: no rate calculated.

For 2017, notification rates were low in northern European countries and higher in eastern European countries (Figure 1).

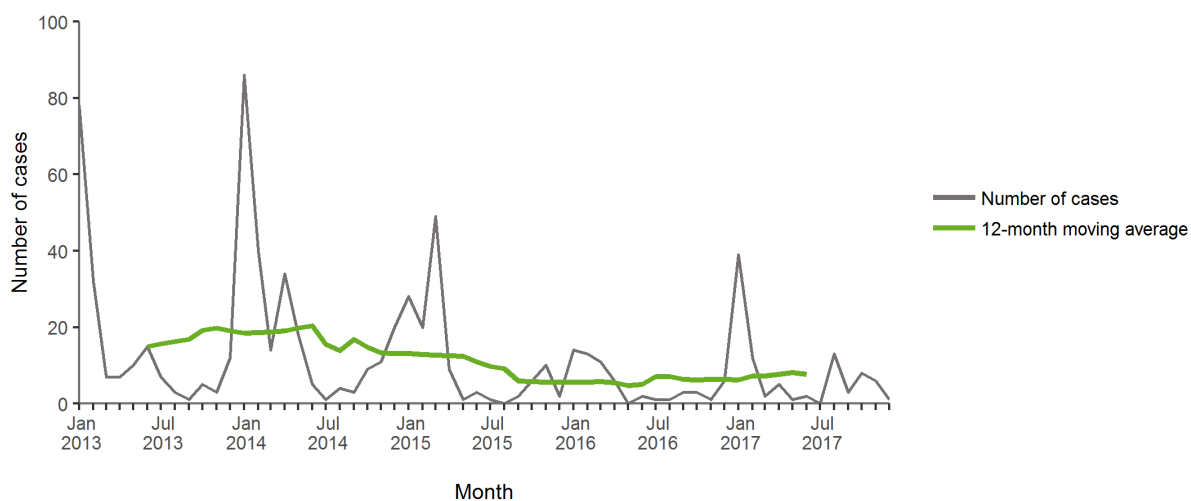
**Figure 1. Distribution of confirmed trichinellosis cases per 100 000 population by country, EU/EEA, 2017**



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, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. No rate calculated for Belgium.

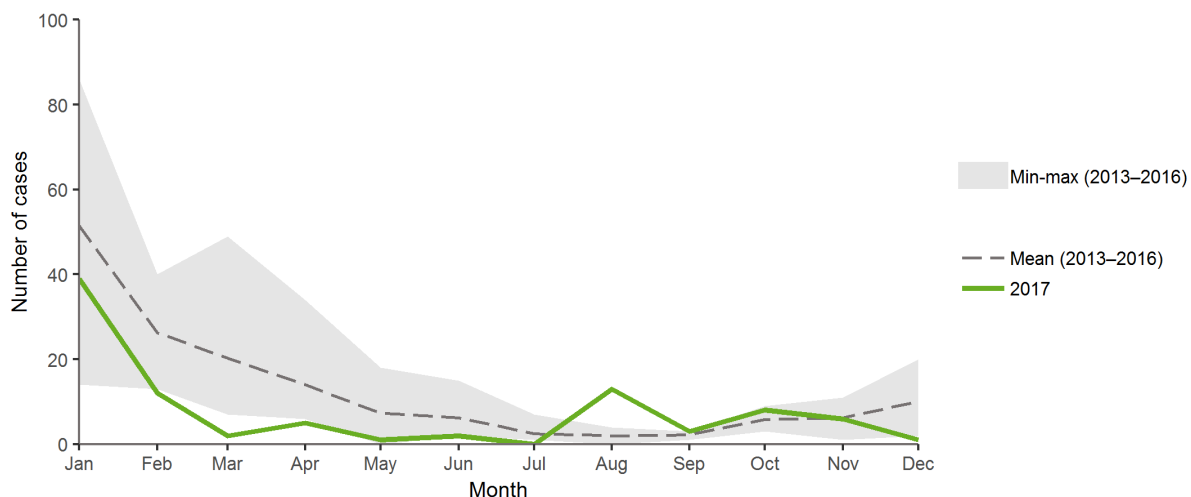
Trichinellosis in the EU/EEA follows a seasonal pattern, with case numbers peaking in January and February (Figures 2–3). In 2017, a small August peak was also observed (Figure 3).

**Figure 2. Distribution of confirmed trichinellosis cases by month, EU/EEA, 2013–2017**



Source: country reports from Austria, Cyprus, the Czech Republic, 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.

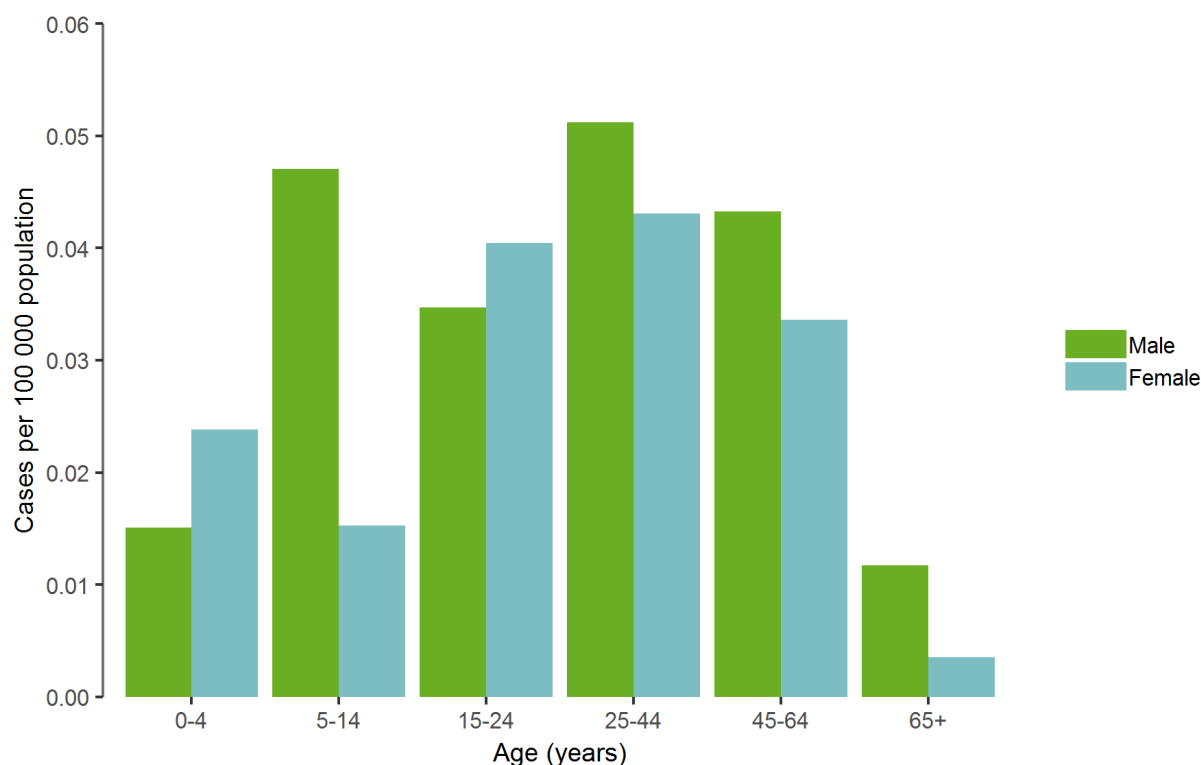
**Figure 3. Distribution of confirmed trichinellosis cases by month, EU/EEA, 2017 and 2013–2016**



Source: country reports from Austria, Cyprus, the Czech Republic, 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.

The highest notification rate was in males in the age-group 25–44 years, with 0.05 cases per 100 000 population (Figure 4). Higher rates in males than females were observed in four of the six age groups. The overall male-to-female ratio was 1.3:1 and 3.3:1 for the age group 5–14 years. Of the male cases in the age group 5–14 years, 53.9% were reported by Bulgaria. The cases in the age group under five years old were reported by Bulgaria, Croatia, Lithuania and Romania.

**Figure 4. Distribution of confirmed trichinellosis cases per 100 000 population by age and gender EU/EEA, 2017**



## Discussion

In the EU/EEA, trichinellosis is a rare but serious human disease. The EU/EEA notification rate increased by 50% compared with 2016 and the number of cases also increased. The increase observed was mainly due to an increase in cases reported by Bulgaria and Romania, as well as Croatia, which had reported low case numbers in previous years. Bulgaria and Romania accounted for the majority of trichinellosis cases in 2017. Despite the increase in the EU/EEA notification rate compared with 2016, the EU trend from 2012–2017 decreased significantly, with the trend greatly influenced by a number of smaller and larger outbreaks [4].

For 2017, seven member states reported 11 outbreaks to the European Food Safety Authority. Four outbreaks were reported by Croatia, two by Romania and France, Lithuania, Poland, Bulgaria and Italy reported one outbreak each. Seven of the outbreaks were due to *T. spiralis* and one due to *T. britovi*. The majority of the outbreaks were associated with 'pig meat and products thereof' (including wild boar) [4].

The Commission Implementing Regulation (EU) 2015/1375 requires tests for *Trichinella* in all slaughtered pigs, wild boars, horses and other farmed or wild animal species susceptible to *Trichinella* infestation from holdings not officially recognised as applying controlled housing conditions [5]. Animals slaughtered for home consumption are not included in the regulation and national rules differ [4]. For carcasses of animals raised under controlled housing conditions, only 10% have to be examined for *Trichinella* and if no autochthonous *Trichinella* infestations have been detected in domestic swine kept under these conditions in the last three years, *Trichinella* examinations are not required [5]. The World Organisation for Animal Health no longer recognises negligible risk status for a whole country or region in an international context. Instead, such recognition is linked to compartments of one or more holdings if specific controlled housing conditions are applied. Belgium and Denmark are the only exceptions, as they had achieved negligible risk status before the new regulation was implemented [4]. For 2017, six Member States reported *Trichinella* in pigs, with infected pigs clustered in Bulgaria, Croatia, Poland, Romania and Spain [4].

The recurring peak in trichinellosis cases in January and February may reflect the consumption of various pork products during the Christmas period and the wild boar hunting season [4]. *Trichinella* is commonly detected in wildlife [6] and cases related to hunting may account for higher notification rates observed among adult males. Investigations into domestic pig *Trichinella* infections in Member States identified direct (free-range pigs) and indirect (e.g. farmers who hunted) contacts with wild animals, which are reservoirs of these zoonotic nematodes, as sources of domestic pig infections [7]. In Lithuania, consumption of infected and uninspected pork from small farms accounted for 57.6% of human trichinellosis outbreaks from 2008–2017 and consumption of infected wild boar accounted for 33.3%. For the remainder the source was unknown [8]. In Bulgaria, the consumption of infected wild boar was the main cause of outbreaks in 2013 and 2014, followed by the consumption of infected domestic pig meat [9].

According to ecological niche modelling of *Trichinella* species, *T. spiralis* may be less widely distributed in northern European countries and the distribution range of *T. britovi* may be concentrated in eastern European countries [10]. Increasing numbers of wild boar and red foxes, as well as the spread of the raccoon dog from eastern to western Europe and jackal from south-eastern to north-western Europe, may increase the prevalence of *Trichinella* circulating among wild animals [4]. The geographical differences in notification rates may partially reflect the different distributions in wildlife.

## Public health implications

Products derived from pig and wild boar meat remain the most important sources of human trichinellosis in the EU/EEA. Consuming undercooked meat from pigs or hunted wild boar which have not been tested for *Trichinella* is a major risk factor for trichinellosis [4] and it is vital that relevant information reaches such consumers.

## References

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