



## SURVEILLANCE REPORT

Annual Epidemiological Report for 2015

# Trichinellosis

### Key facts

- In 2015, a total of 156 confirmed cases of trichinellosis was reported from 29 EU/EEA countries.
- The overall notification rate was 0.03 cases per 100 000 population.
- Bulgaria, Lithuania and Romania accounted for 63% of all confirmed cases.
- Consumption of undercooked meat from pigs raised under non-controlled housing conditions or from hunted wild boar constitutes the highest risk for acquiring trichinellosis in the EU/EEA today.

### Methods

This report is based on data for 2015 retrieved from The European Surveillance System (TESSy) on 15 November 2016. 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 [1].

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

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

Twenty-nine countries reported data for 2015, 14 of which reported zero cases. No surveillance system for trichinellosis exists in Denmark. Twenty-two countries reported data using the 2008 or 2012 EU case definitions for trichinellosis, which are identical; one country used the 2002 definition, four countries used another definition, and two had not specified the definition used [2]. Notification of trichinellosis is mandatory in 26 countries and voluntary in three. Belgium has sentinel surveillance with an unknown population coverage. Four countries have active surveillance systems while the rest have passive systems. Twenty countries have surveillance systems which integrate laboratory and epidemiological data.

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## Epidemiology

In 2015, 243 cases of trichinellosis, 156 of which were confirmed, were reported in the EU/EEA (Table 1). The EU/EEA notification rate was 0.03 cases per 100 000 population, a decrease of 57% compared with 2014 and also the lowest rate observed since the start of reporting to TESSy in 2007. The decrease observed in 2015 was mainly due to a reduced number of trichinellosis cases reported by Bulgaria and Romania, which in previous years had reported the highest case numbers. In Bulgaria, only one outbreak (of *T. britovi* due to wild boar meat) was reported in 2015, compared with five in 2014 (I. Rainova, National Centre of Infectious and Parasitic Diseases, Sofia, personal communication, 12 July 2016). In Romania, the reason for the decrease was unknown but could possibly be due to better risk communication to the public on preventive measures and preventive medication when *Trichinella* was detected in meat (L. Zota, National Institute of Public Health, Bucharest, personal communication, 8 July 2016).

Lithuania reported the highest notification rate in the EU in 2015 (0.72 cases per 100 000 population), followed by Bulgaria and Romania (0.31 and 0.28 cases per 100 000 population, respectively). The increase of cases in Lithuania was attributed to an outbreak with 20 cases caused by wild boar meat, from January to March 2015 (G. Zagrebneviene, Centre for Communicable diseases and AIDS, Vilnius, personal communication, 20 July 2016). Notification rates were generally higher in the eastern part of the EU/EEA (Figure 1). Fifteen Member States reported zero confirmed cases in 2015.

Sweden reported one case of travel-associated trichinellosis; the actual travel destination was unknown. The remaining 130 cases with individual case information were either reported as domestically acquired (96%) or had an unknown travel status (3%).

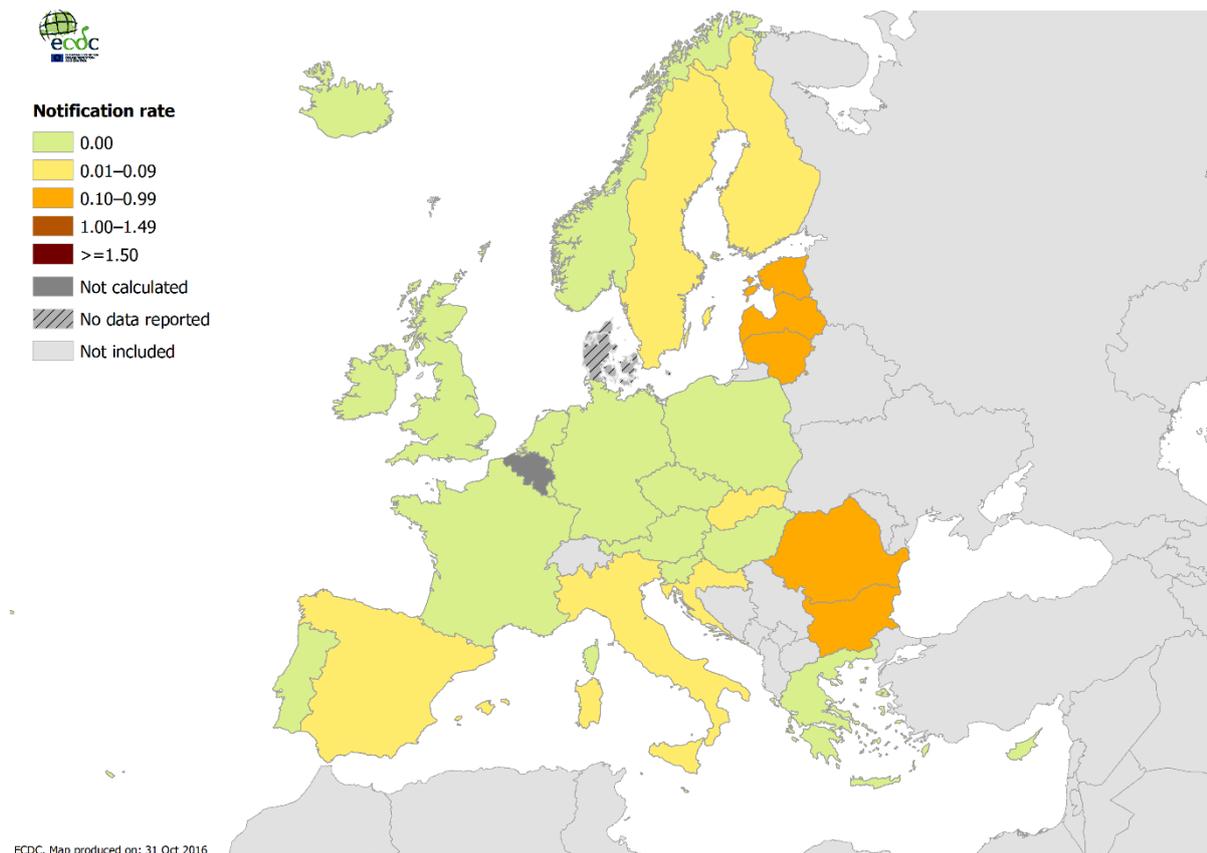
**Table 1. Confirmed cases of trichinellosis: number and rate per 100 000 population, by country and year, EU/EEA, 2011–2015**

Country	2011		2012		2013		2014		2015				
	Confirmed cases		Confirmed cases		Confirmed cases		Confirmed cases		National coverage	Reported cases	Confirmed cases		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate			Number	Rate	ASR
Austria	1	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Belgium	0	-	0	-	1	-	16	-	N	2	0	-	-
Bulgaria	27	0.4	30	0.4	36	0.5	60	0.8	Y	22	22	0.3	0.3
Croatia	.	.	.	.	0	0.0	3	0.1	Y	3	3	0.1	0.1
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Czech Republic	0	0.0	1	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0.0	0	0.0	0	0.0	0	0.0	Y	2	2	0.2	0.2
Finland	0	0.0	0	0.0	0	0.0	0	0.0	Y	1	1	0.0	0.0
France	2	0.0	0	0.0	0	0.0	0	0.0	Y	3	3	0.0	0.0
Germany	3	0.0	2	0.0	14	0.0	1	0.0	Y	8	3	0.0	0.0
Greece	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Hungary	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Italy	6	0.0	33	0.1	0	0.0	4	0.0	Y	36	36	0.1	0.1
Latvia	50	2.4	41	2.0	11	0.5	5	0.2	Y	4	4	0.2	0.2
Lithuania	29	1.0	28	0.9	6	0.2	5	0.2	Y	38	21	0.7	0.7
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Netherlands	1	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Poland	10	0.0	1	0.0	4	0.0	6	0.0	Y	27	1	0.0	0.0
Portugal	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
Romania	107	0.5	149	0.7	116	0.6	221	1.1	Y	92	55	0.3	0.3
Slovakia	13	0.2	5	0.1	5	0.1	0	0.0	Y	1	1	0.0	0.0
Slovenia	1	0.0	1	0.0	1	0.0	0	0.0	Y	0	0	0.0	0.0
Spain	18	0.0	10	0.0	23	0.0	1	0.0	Y	3	3	0.0	0.0
Sweden	0	0.0	0	0.0	0	0.0	1	0.0	Y	1	1	0.0	0.0
United Kingdom	0	0.0	0	0.0	0	0.0	1	0.0	Y	0	0	0.0	0.0
<b>EU</b>	<b>268</b>	<b>0.1</b>	<b>301</b>	<b>0.1</b>	<b>217</b>	<b>0.0</b>	<b>324</b>	<b>0.1</b>	<b>Y</b>	<b>243</b>	<b>156</b>	<b>0.0</b>	<b>0.0</b>

Country	2011		2012		2013		2014		2015				
	Confirmed cases		Confirmed cases		Confirmed cases		Confirmed cases		National coverage	Reported cases	Confirmed cases		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate			Number	Rate	ASR
Iceland	.	.	.	.	0	0.0	0	0.0	Y	0	0	0.0	0.0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.
Norway	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0	0.0	0.0
EU/EEA	268	0.1	301	0.1	217	0.0	324	0.1	.	243	156	0.0	0.0

Source: Country reports. Legend: Y = yes, N = no, . = no data reported, ASR: age-standardised rate, - = no report

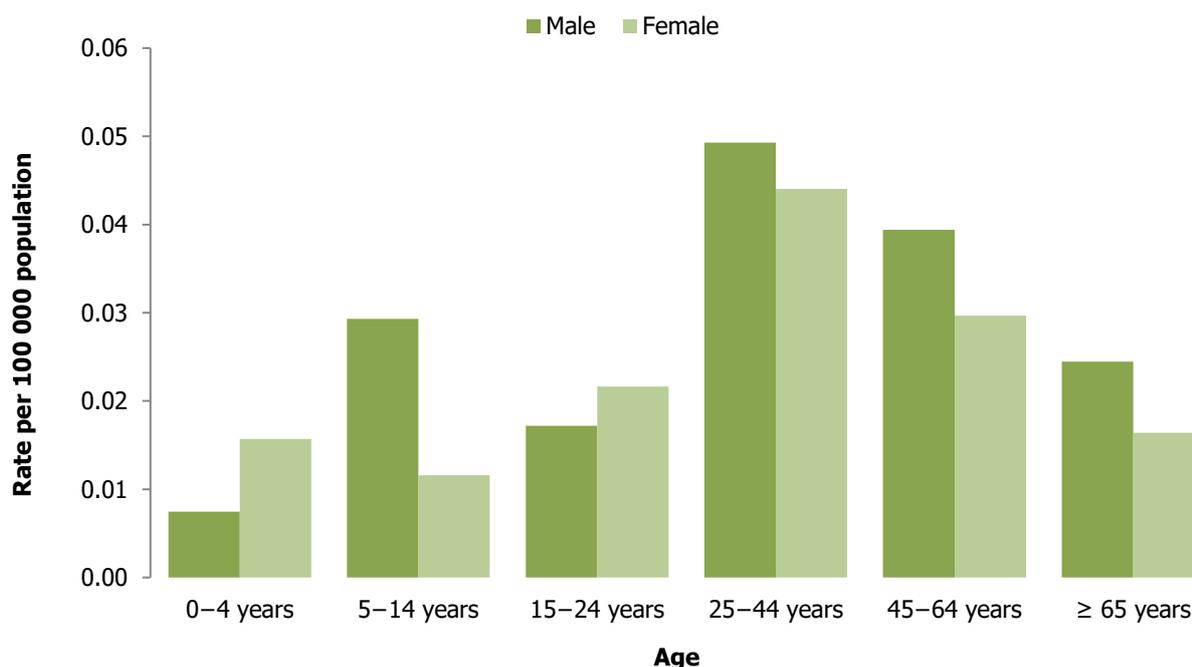
**Figure 1. Confirmed trichinellosis cases: rate per 100 000 population by country, EU/EEA, 2015**



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.

The highest case rate of trichinellosis was observed among 25–44-year-olds, with 0.05 cases per 100 000 population, followed by 45–64-year-olds (0.3 cases per 100 000 population) (Figure 2). Notification rates varied by gender, with higher rates among male cases in the age groups 5–14 and older than 24 years, and among female cases in the age groups under 5 years and 15–24 years. The overall male-to-female ratio was 1.2:1. Italy, Lithuania and Romania were the countries that reported almost all cases among children and young teenagers (0–14 years of age).

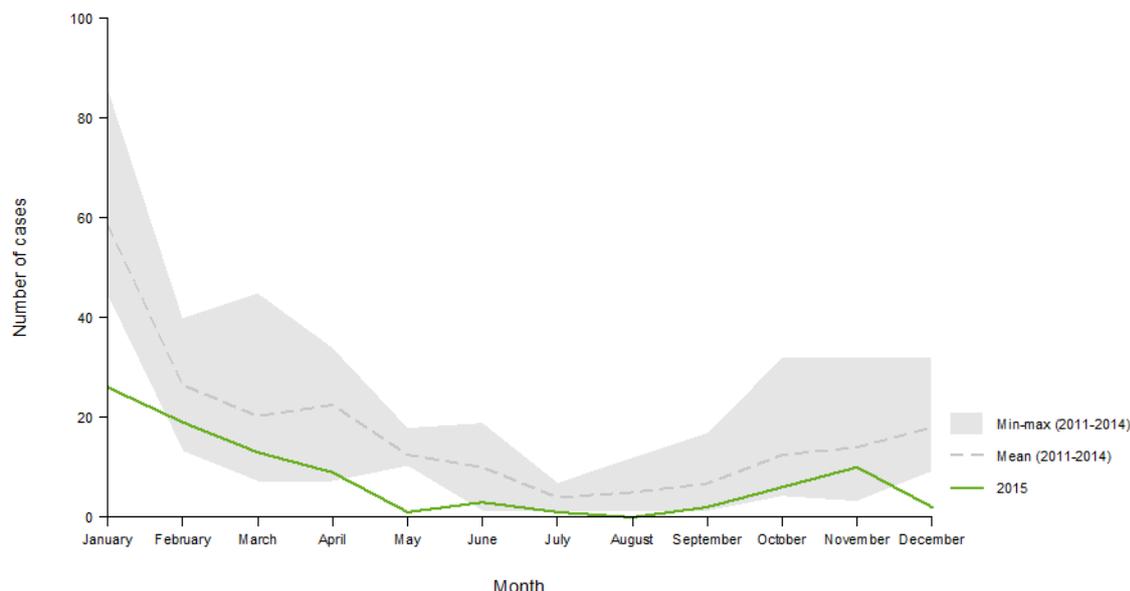
**Figure 2. Confirmed trichinellosis cases: rate per 100 000 population, by age and gender, EU/EEA, 2015**



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.

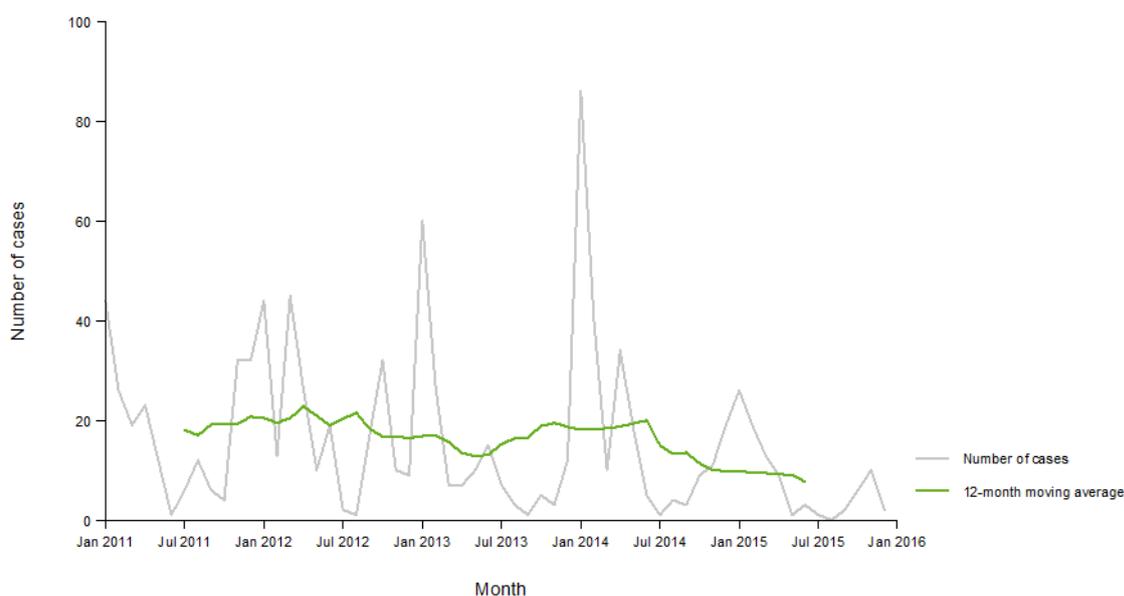
Trichinellosis in the EU/EEA follows a seasonal pattern, with case numbers peaking in January and February (Figures 3 and 4). In 2015, this peak was lower than in previous years and followed by a smaller peak in November. Please note that cases from Bulgaria and Croatia are not included in Figures 3 and 4 as data were not provided at the level of resolution required for the analysis.

**Figure 3. Number of confirmed cases of trichinellosis by month in 2015, compared with 2011–2014, EU/EEA**



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

**Figure 4. Trend and number of confirmed cases of trichinellosis by month, and 12-month moving average, 2011–2015, EU/EEA**



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

## Discussion

Trichinellosis is an uncommon but serious human disease that is still present in the EU, with most cases reported from a few Member States in the eastern part of Europe. Bulgaria, Lithuania and Romania accounted for the majority of cases in 2015. Almost half of the Member States reported zero cases, including four Member States that have not reported trichinellosis cases since 2007. The EU notification rate decreased in 2015 and was the lowest ever reported (from 2007). The decrease in 2015 was mainly due to a decline in cases reported from Bulgaria and Romania, which had experienced the majority of *Trichinella* outbreaks in previous years.

In 2015, the EU trend for trichinellosis was greatly influenced by a number of outbreaks, which peaked between January and March. In total, 15 *Trichinella* outbreaks were reported by eight Member States, affecting 119 people, 34 of whom were hospitalised [4]. Twelve of the outbreaks were reported with strong causal evidence, and nine of these were associated with 'pig meat and products thereof' (including four outbreaks involving meat from hunted wild boars). 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. 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. The World Organisation for Animal Health (OIE) no longer recognises this negligible risk status for a whole country or region in an international context. Instead, it can only be granted to compartments of one or more holdings if specific controlled housing conditions are applied. Belgium and Denmark are the only exceptions to this rule as they had achieved this status already before the new Regulation entered into force [4].

The recurring peak in trichinellosis cases in January and February may reflect the consumption of different pork products during Christmas as well as the end of the hunting season. *Trichinella* is commonly detected in wildlife [4] and cases related to hunting may account for the higher notification rates observed among adult males. In the last decades, investigations carried out in Member States to identify the source of *Trichinella* infections in domestic pigs, identified direct (free-range pigs) or indirect (e.g. farmers who hunted) contacts with wild animals which are the reservoir of these zoonotic nematodes [5]. A study in Greece suggests that the increase of *Trichinella* in farm animals is the result of an increasing demand for organically produced meat from free-range pigs which are sometimes fed with carcasses or offal from hunted or dead wild animals [6].

## Public health implications

Products derived from pig and wild boar meat remain the most important sources of human trichinellosis in the EU. Consuming undercooked meat from backyard pigs or hunted wild boar which were not tested for *Trichinella* is a major risk factor for trichinellosis, and it is vital that this information reaches those who consume these meats.

## References

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