

Tularaemia

Annual Epidemiological Report for 2019

Key facts

- For 2019, 21 countries in the EU/EEA reported 1 463 confirmed cases of tularaemia.
- The EU/EEA notification rate for 2019 was 0.3 cases per 100 000 population.
- The male-to-female ratio was 1.5:1. As in previous years, the notification rate among males was higher in all age groups, except for the 0–4 years age group.
- Notification rates increased with age and peaked at 45–64 years.

Introduction

Tularaemia, caused by the *Francisella tularensis* bacteria, is a rare zoonotic disease which is not transmissible from human to human. A range of wild and domestic animals, such as hares or rodents, may function as vertebrate reservoir hosts for tularaemia. There are various routes of transmission to humans, such as ingestion of contaminated food or water, handling of infected animals or bites from haematophagous arthropod vectors (e.g. ticks or mosquitoes). *F. tularensis* is largely distributed in the Northern hemisphere and is not normally found in the tropics or the southern hemisphere. Early signs of the disease are influenza-like symptoms (e.g. fever, fatigue, chills or headache). There are several clinical forms of the disease that are influenced by the entry route of the bacteria.

Methods

This report is based on data for 2019 retrieved from The European Surveillance System (TESSy) on 9 October 2020. 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].

For 2019, 29 EU/EEA countries reported data on tularaemia (Denmark and Liechtenstein did not report). Twenty-seven countries reported case-based data and Belgium and Bulgaria reported aggregated data. Twenty-six countries used the EU case definition, two countries used an alternative case definition (Germany and Italy) and one country did not specify the case definition they used (France). Reporting is compulsory in 28 countries and voluntary in the United Kingdom. Surveillance is comprehensive in all reporting countries and mostly passive.

Epidemiology

For 2019, 21 EU/EEA countries reported 1 463 confirmed cases of tularaemia (Table 1, Figure 1). Sweden reported most cases, accounting for 56% of all reported cases. Eight countries reported no cases.

The overall notification rate was 0.3 cases per 100 000 population.

Table 1. Distribution of confirmed tularaemia cases and rates per 100 000 population by country and year, EU/EEA, 2015–2019

Country	2015		2016		2017		2018		2019		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	ASR
Austria	4	0.0	9	0.1	13	0.1	7	0.1	20	0.2	0.2
Belgium	1	0.0	1	0.0	5	0.0	0	0.0	4	0.0	0.0
Bulgaria	17	0.2	2	0.0	1	0.0	1	0.0	1	0.0	0.0
Croatia	13	0.3	2	0.0	3	0.1	0	0.0	1	0.0	0.0
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Czechia	56	0.5	59	0.6	51	0.5	32	0.3	102	1.0	0.9
Denmark	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0.0	1	0.1	0	0.0	1	0.1	2	0.2	0.1
Finland	104	1.9	699	12.7	32	0.6	7	0.1	48	0.9	0.9
France	28	0.0	47	0.1	19	0.0	11	0.0	45	0.1	0.1
Germany	34	0.0	41	0.0	52	0.1	52	0.1	71	0.1	0.1
Greece	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Hungary	35	0.4	22	0.2	11	0.1	17	0.2	22	0.2	0.2
Iceland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Italy	-	-	0	0.0	2	0.0	0	0.0	1	0.0	0.0
Latvia	0	0.0	1	0.1	0	0.0	0	0.0	2	0.1	0.1
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.
Lithuania	4	0.1	2	0.1	5	0.2	5	0.2	4	0.1	0.1
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Netherlands	1	0.0	5	0.0	1	0.0	2	0.0	3	0.0	0.0
Norway	42	0.8	40	0.8	92	1.7	58	1.1	183	3.4	3.4
Poland	9	0.0	18	0.0	30	0.1	16	0.0	21	0.1	0.1
Portugal	0	0.0	0	0.0	0	0.0	2	0.0	1	0.0	0.0
Romania	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Slovakia	28	0.5	7	0.1	2	0.0	6	0.1	20	0.4	0.4
Slovenia	0	0.0	3	0.1	1	0.0	4	0.2	7	0.3	0.3
Spain	22	0.0	3	0.0	11	0.0	4	0.0	88	0.2	0.2
Sweden	722	7.4	134	1.4	84	0.8	102	1.0	817	8.0	7.9
United Kingdom	1	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0.0
EU-EEA	1122	0.3	1096	0.2	415	0.1	328	0.1	1463	0.3	0.3

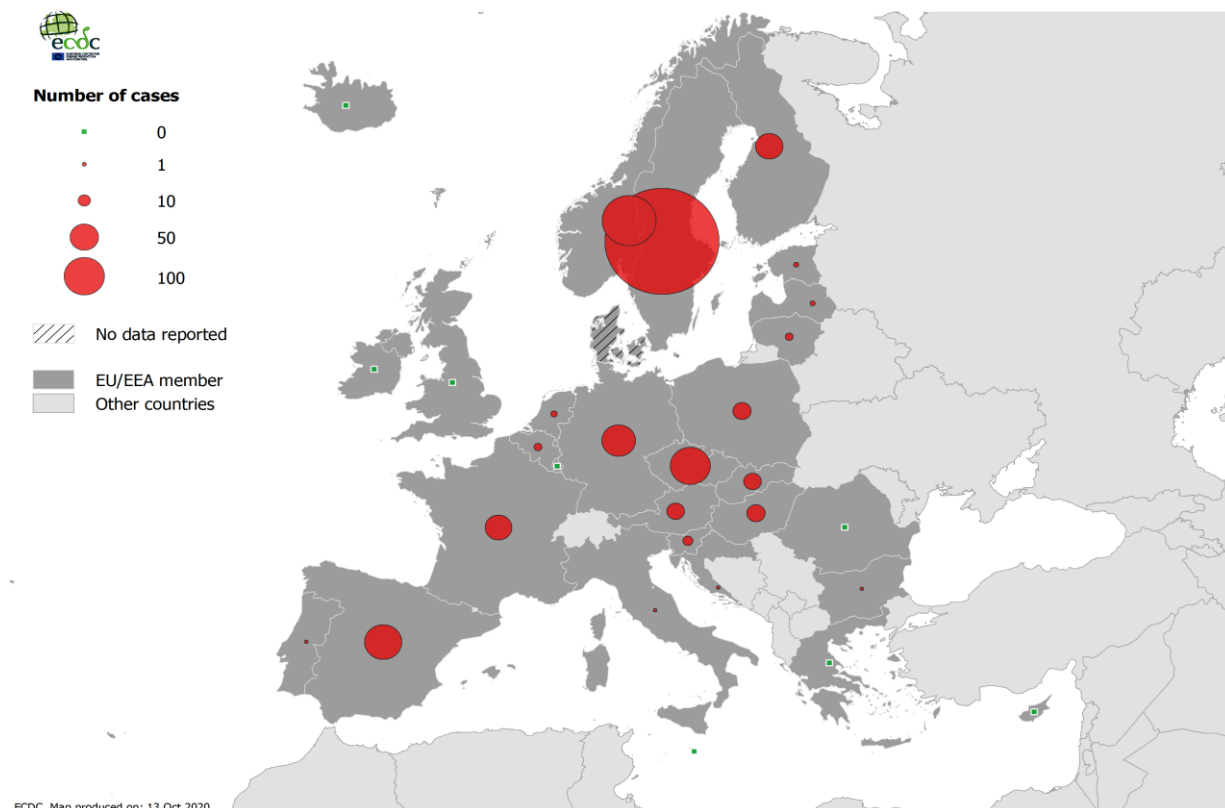
Source: country reports.

ASR: age-standardised rate

..: no data reported

-.: no rate calculated.

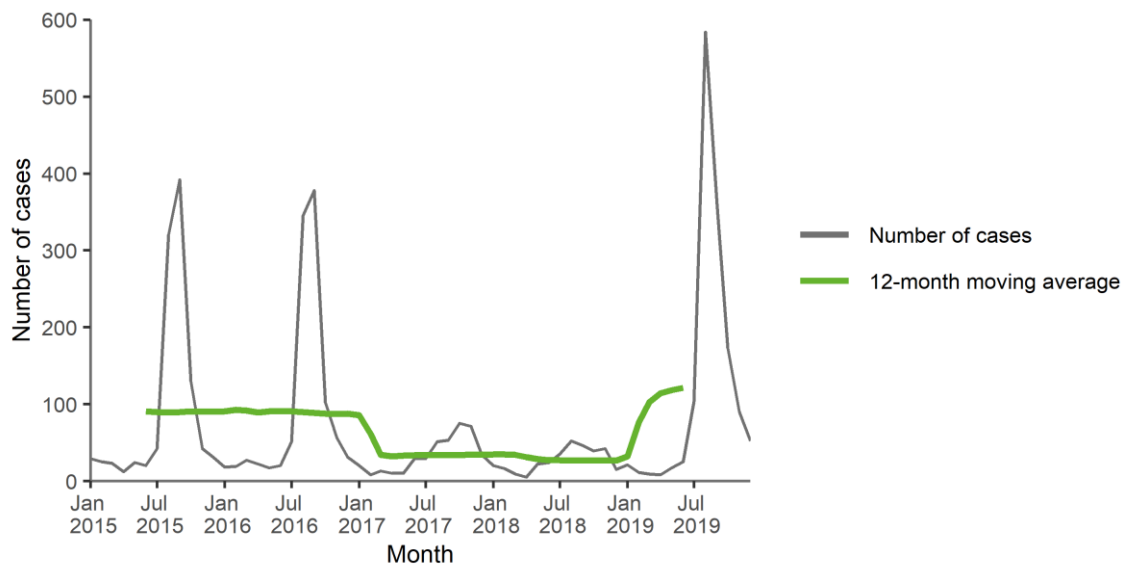
Figure 1. Distribution of confirmed tularaemia cases by country, EU/EEA, 2019



Source: country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, 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.

In 2019, an increase of the 12-month moving average was observed compared to previous years. This was mainly driven by the large outbreak in Sweden. However, also other countries reported higher case numbers than in previous four years (e.g. Austria, Czechia, Norway, Spain).

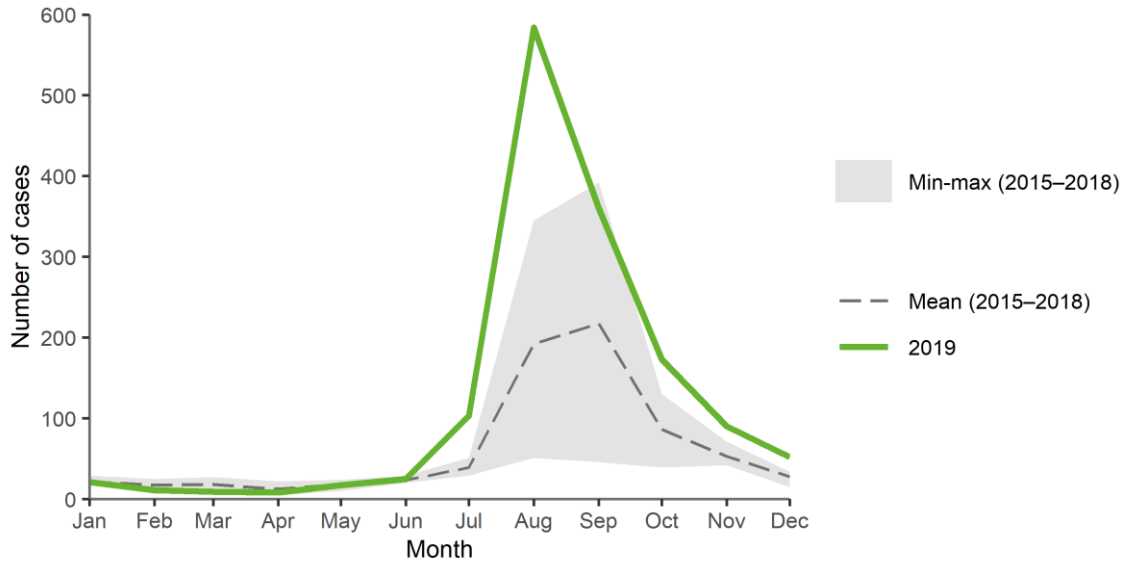
Figure 2. Distribution of confirmed tularaemia cases by month, EU/EEA, 2015–2019



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

Tularaemia shows a seasonal pattern, with most cases occurring from July to November. The 2019 peak of infections was in August, which is slightly earlier compared with the mean for the 2015–2018 period (Figure 3).

Figure 3. Distribution of confirmed tularaemia cases by month, EU/EEA, 2019 and 2015–2018

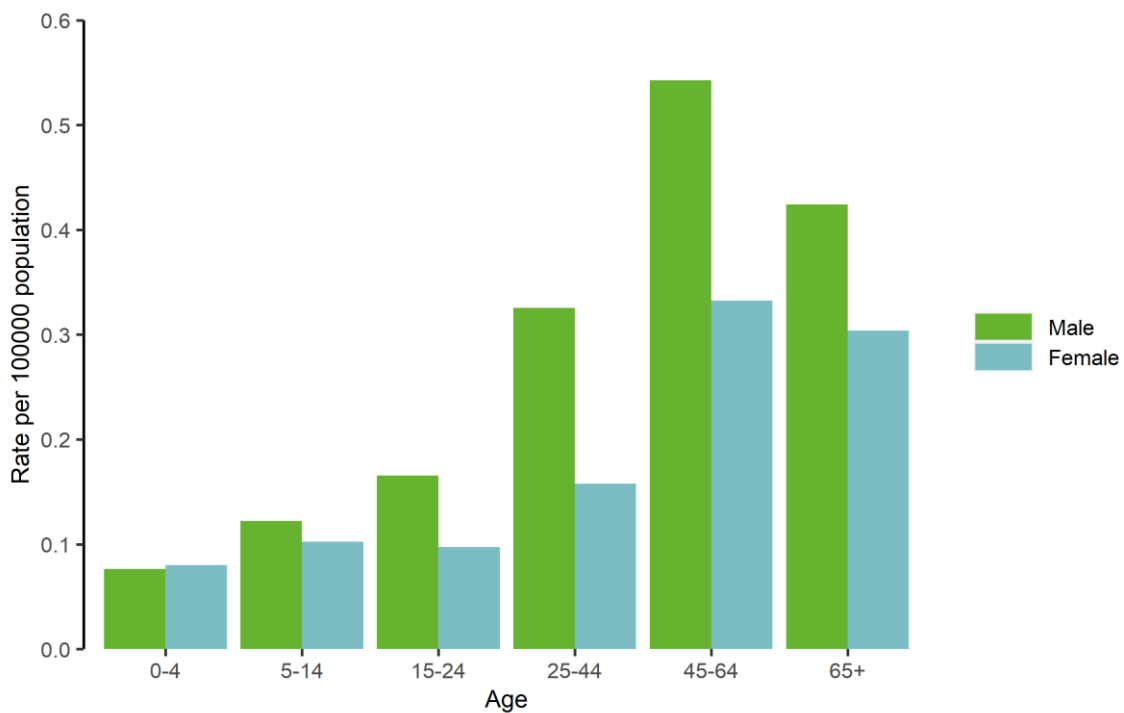


Source:

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

As in previous years, the proportion of male cases was higher in all age groups, except for those aged 0–4 years (Figure 4). The male-to-female ratio in 2019 was 1.5:1. Notification rates increased with age, peaking at 45–64 years (0.5 and 0.3 cases per 100 000 population for men and women, respectively) and decreasing for 65+ years (0.4 and 0.3 cases per 100 000 population for men and women, respectively).

Figure 4. Distribution of confirmed tularaemia rate per 100 000 population, by age and gender, EU/EEA, 2019



Discussion

Tularaemia is widely distributed throughout most of Europe. In the endemic regions within Scandinavian countries, tularaemia is typically transmitted by mosquito bites [4]. In certain countries, the ingestion of contaminated water is the main transmission route of the disease [5,6]. The disease shows a seasonal pattern in humans [7], consistent with a higher likelihood of exposure during the summer and autumn months due to recreational outdoors activities (notably hunting), exposure to contaminated water and mosquito bites.

Notification rates of tularaemia vary among Member States and over time. Between 2014 and 2015, Sweden had the highest notification rate. In 2016, Finland had the highest rate observed among Member States for the previous five years. Literature reports from Finland indicate that tularaemia outbreaks are preceded one year earlier by a peak in vole populations [8]. This increase in the number of voles was observed in 2015 and, coupled with climatic conditions in 2016 that contributed to an abundant mosquito population, favoured transmission to humans. In 2017, Norway and Sweden reported higher numbers of cases, while the number of cases reported from Finland decreased compared with 2016. In 2018, a major outbreak occurred in western France, with the highest incidence reported in France since 2002. In 2019, Sweden experienced its largest outbreak of tularaemia in over 50 years. The outbreak started in July and as of 6 October 2019, more than 970 cases had been reported [9]. The predominant route of transmission was via mosquito bites [9].

Data are available on tularaemia surveillance in animals across the European region in the annual ECDC/EFSA report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks [10].

Public health implications

Prevention measures include avoiding drinking untreated surface water; using insect repellent; wearing clothes which cover the legs and arms to avoid tick and mosquito bites; avoiding contact with dead animals, not mowing over sick or dead animals and cooking game meat thoroughly before eating. The handling of biological samples potentially contaminated with *F. tularensis* should be carried out in biosafety level 3 laboratories [6]. Due to the various modes of transmission, several population groups are at potential risk of infection. Physicians should be aware of the various clinical presentations of tularaemia (oropharyngeal, glandular and ulcero-glandular, oculo-glandular, pneumonic and typhoid form) [6] and consider tularaemia as a possible diagnosis in any case of culture-negative endocarditis.

References

1. European Centre for Disease Prevention and Control. Introduction to the Annual Epidemiological Report Stockholm: ECDC; 2020. Available from: <https://ecdc.europa.eu/en/annual-epidemiological-reports/methods>
2. European Centre for Disease Prevention and Control. Surveillance systems overview [internet, downloadable spreadsheet]. Stockholm: ECDC; 2020. Available from: <https://ecdc.europa.eu/en/publications-data/surveillance-systems-overview-2019>
3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases. Stockholm: ECDC; 2020 [18 Nov 2020]. Available from: <http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=55>
4. Kenney A, Cusick A, Payne J, Gaughenbaugh A, Renshaw A, Wright J, et al. The potential for flower nectar to allow mosquito to mosquito transmission of Francisella tularensis. PloS one. 2017;12(5):e0175157.
5. Hennebique A, Boisset S, Maurin M. Tularemia as a waterborne disease: a review. Emerging microbes & Infections. 2019;8(1):1027-42.
6. European Centre for Disease Prevention and Control. Facts about tularaemia Stockholm: ECDC. Available from: <https://ecdc.europa.eu/en/tularaemia/facts>
7. Hestvik G, Warns-Petit E, Smith L, Fox N, Uhlhorn H, Artois M, et al. The status of tularemia in Europe in a one-health context: a review. Epidemiology & Infection. 2015;143(10):2137-60.
8. Rossow H, Ollgren J, Hytonen J, Rissanen H, Huitu O, Henttonen H, et al. Incidence and seroprevalence of tularaemia in Finland, 1995 to 2013: regional epidemics with cyclic pattern. Eurosurveillance: European communicable disease bulletin. 2015 Aug 20;20(33):21209.
9. Dryselius R, Hjertqvist M, Makitalo S, Lindblom A, Lilja T, Eklof D, et al. Large outbreak of tularaemia, central Sweden, July to September 2019. Euro surveillance: European communicable disease bulletin. 2019 Oct;24(42).
10. EFSA (European Food Safety Authority) and ECDC (European Centre for Disease Prevention and Control). The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2018. EFSA Journal. 2019 18 Nov 2020;17(12):5926.