

Leptospirosis

Annual Epidemiological Report for 2020

Key facts

- For 2020, 21 countries reported 565 confirmed cases of leptospirosis, the lowest number in the period from 2016–2020.
- The notification rate was 0.14 confirmed cases per 100 000 population in the EU/EEA, with higher rates in males compared with females.
- There was no obvious long-term trend in the 2016–2020 period.
- The low case numbers of leptospirosis reported for 2020 may be associated with changes in population behaviours and disruptions in surveillance during the COVID-19 pandemic.
- Avoiding contact with water contaminated with animal urine, vaccination of animal carriers and rodent control may prevent a significant proportion of leptospirosis cases.

Introduction

Leptospirosis is a widespread zoonotic disease caused by spirochetes bacteria of the genus *Leptospira*, which live in the kidneys of their natural hosts, such as rodents. Humans are infected by contact with the carrier's urine or urine-contaminated environment [1]. Clinical presentation ranges from mild flu-like illness to severe disease with possible fatal outcome.

Methods

This report is based on data for 2020 retrieved from The European Surveillance System (TESSy) on 19 January 2022. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases.

For a detailed description of the methods used to produce this report, please refer to the 'Methods' chapter in the 'Introduction to the Annual Epidemiological Report' [2].

An overview of the national surveillance systems is available online [3].

A subset of the data used for this report is available through ECDC's online *Surveillance Atlas of Infectious Diseases* [4].

For 2020, 28 EU/EEA countries (apart from Norway and Liechtenstein) reported data. In addition, as the United Kingdom (UK) withdrew from the EU on 31 January 2020, the country was not included in the data call, and consequently did not provide data. Seven countries (Cyprus, Finland, Iceland, Lithuania, Luxembourg, Malta and Sweden) reported zero cases. All countries reported case-based data, except for Belgium and Bulgaria.

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Nine countries used the EU-2018 case definition, eight used the EU-2012 case definition, six used the EU-2008 case definition, and one used the EU-2002 case definition. Denmark, France, Italy and Germany reported cases based on other case definitions. The 2012 case definition includes laboratory criteria for all pathogenic *Leptospira* species, while the 2008 case definition was limited to *Leptospira interrogans*. A note was added to the 2018 case definition recommending that the countries not capturing clinical symptoms, should report all laboratory-confirmed individuals as confirmed cases.

All reporting countries had a comprehensive surveillance system.

Epidemiology

For 2020, 21 EU/EEA countries reported 907 leptospirosis cases of which 565 (62%) were classified as confirmed. The remaining 342 cases (38%) were reported as probable (Table 1). France reported 323 (94%) of the 342 probable cases. Four countries (France, Germany, the Netherlands and Portugal) accounted for 66% of all notified cases, although their combined populations only represent approximately 34% of the total population of the EU/EEA.

The notification rate was 0.14 confirmed cases per 100 000 population. This rate fluctuated between 0.14 and 0.21 cases per 100 000 population in the period from 2016–2020, with no obvious long-term trend. There was no discernible geographical pattern in the distribution of cases (Figure 1). Four countries (Estonia, Ireland, Portugal and Slovenia) had a notification rate above 0.50 confirmed cases per 100 000 population. Age-standardised notification rates did not differ substantially from crude rates.

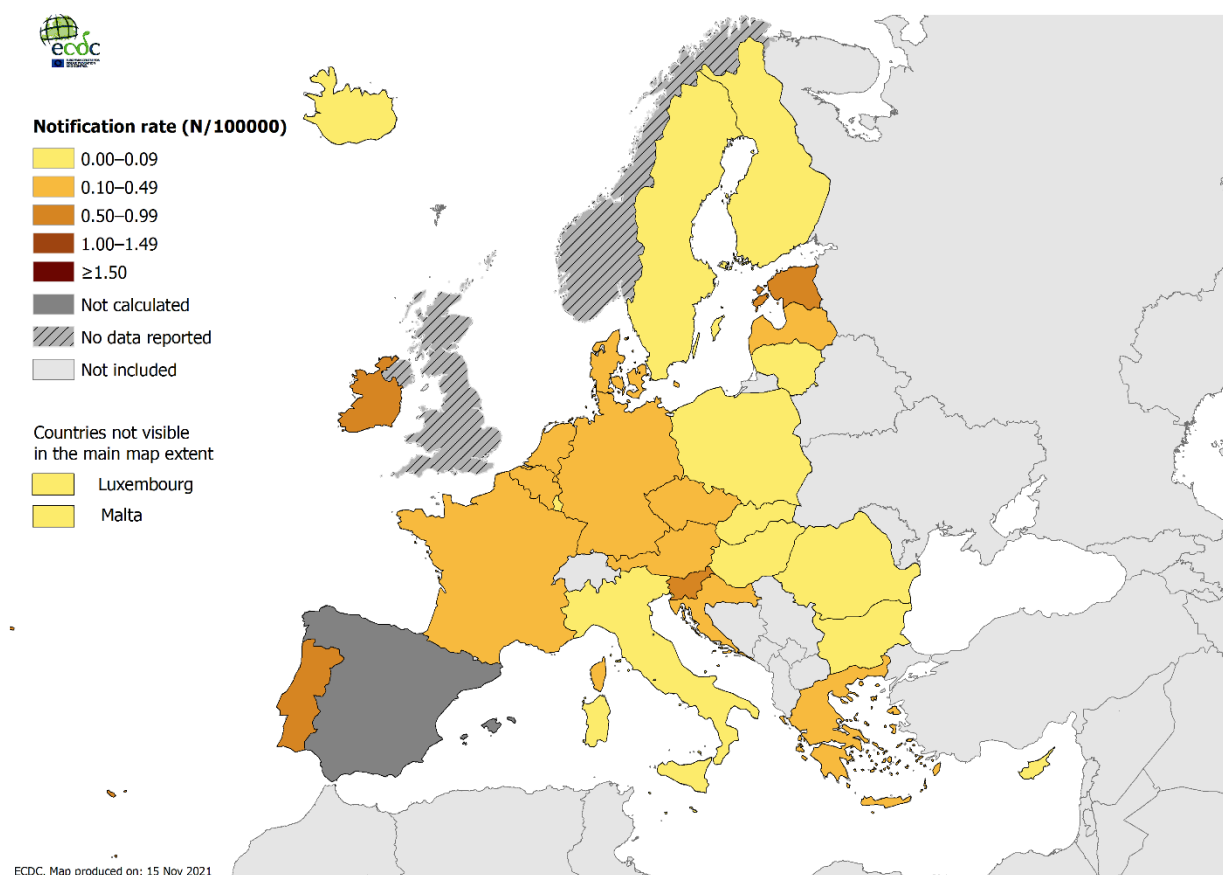
Table 1. Distribution of confirmed leptospirosis cases and rates per 100 000 population by country and year, EU/EEA, 2016–2020

Country	2016		2017		2018		2019		2020		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	ASR
Austria	14	0.16	68	0.78	24	0.27	24	0.27	11	0.12	0.12
Belgium	19	0.17	17	0.15	20	0.18	18	0.16	11	0.10	-
Bulgaria	9	0.13	5	0.07	15	0.21	7	0.10	1	0.01	0.01
Croatia	11	0.26	24	0.58	7	0.17	22	0.54	4	0.10	0.09
Cyprus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Czechia	18	0.17	21	0.20	10	0.09	24	0.23	27	0.25	0.25
Denmark	15	0.26	22	0.38	19	0.33	13	0.22	14	0.24	0.25
Estonia	3	0.23	5	0.38	6	0.45	5	0.38	10	0.75	0.71
Finland	1	0.02	0	0.00	0	0.00	0	0.00	0	0.00	0.00
France	79	0.12	134	0.20	129	0.19	201	0.30	127	0.19	-
Germany	91	0.11	129	0.16	117	0.14	160	0.19	118	0.14	0.15
Greece	19	0.18	24	0.22	18	0.17	27	0.25	17	0.16	0.16
Hungary	15	0.15	14	0.14	19	0.19	14	0.14	3	0.03	0.03
Iceland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Ireland	26	0.55	19	0.40	19	0.39	17	0.35	25	0.50	0.52
Italy	54	0.09	32	0.05	41	0.07	34	0.06	18	0.03	0.03
Latvia	5	0.25	8	0.41	4	0.21	4	0.21	3	0.16	0.16
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.
Lithuania	18	0.62	16	0.56	3	0.11	0	0.00	0	0.00	0.00
Luxembourg	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Malta	1	0.22	2	0.43	2	0.42	4	0.81	0	0.00	0.00

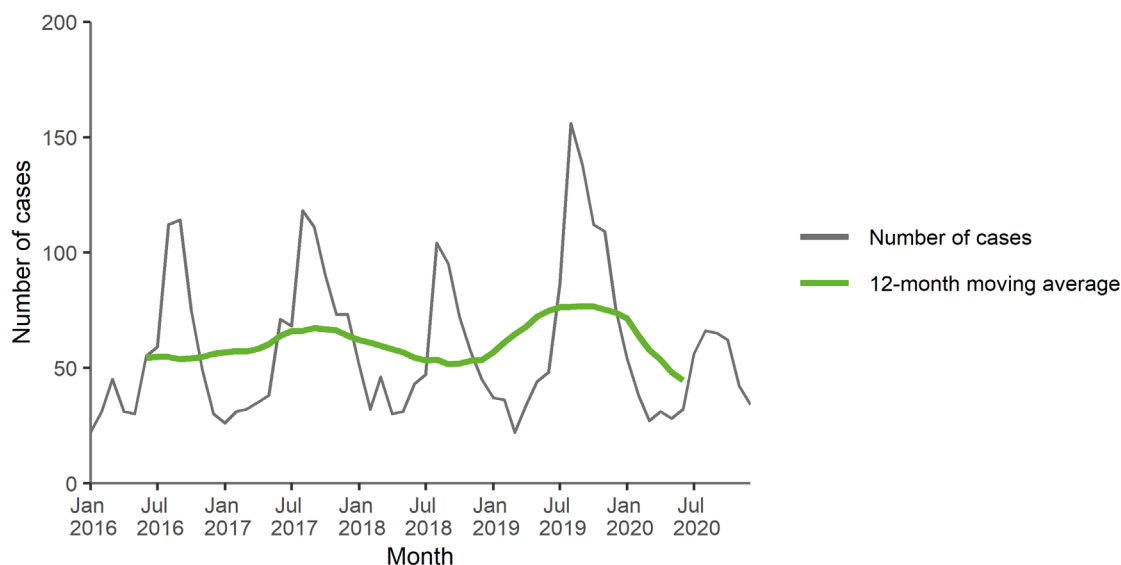
Country	2016		2017		2018		2019		2020		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	ASR
Netherlands	95	0.56	77	0.45	45	0.26	111	0.64	60	0.34	0.35
Norway	.	.	.	.	.	.	.	.	.	.	.
Poland	4	0.01	2	0.01	7	0.02	4	0.01	1	0.00	0.00
Portugal	101	0.98	117	1.13	69	0.67	82	0.80	70	0.68	0.62
Romania	65	0.33	44	0.22	51	0.26	66	0.34	10	0.05	0.05
Slovakia	10	0.18	7	0.13	3	0.06	5	0.09	3	0.05	0.06
Slovenia	17	0.82	24	1.16	18	0.87	59	2.84	12	0.57	0.52
Spain	16	-	19	-	65	-	49	-	20	-	-
Sweden	1	0.01	4	0.04	3	0.03	7	0.07	0	0.00	0.00
United Kingdom	76	0.12	98	0.15	88	0.13	92	0.14	-	-	-
EU-EEA	783	0.17	932	0.20	802	0.16	1049	0.21	565	0.14	-

Source: Country reports
 ASR: age-standardised rate
 .: no data reported
 -: no rate calculated

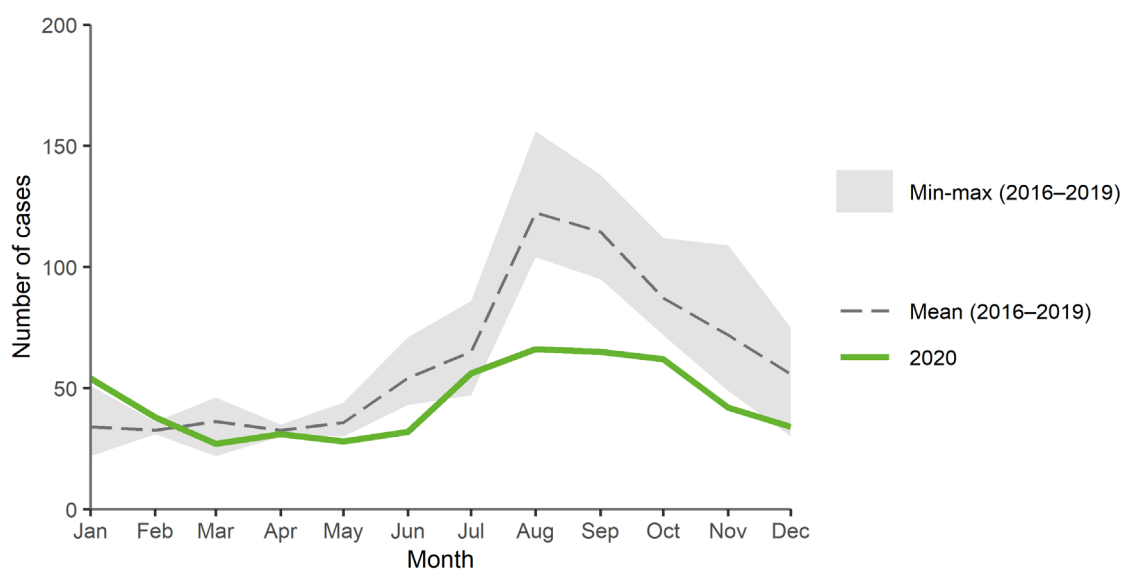
Figure 1. Distribution of confirmed leptospirosis cases per 100 000 population by country, EU/EEA, 2020



For 2020, the distribution of cases by the month of reporting shows that the majority of cases occurred around the European summer time, similar to previous years but with a less pronounced seasonality (Figure 2). Thus, 53% of the 2020 cases were reported between June and October, while this proportion fluctuated between 57% and 64% in the period from 2016–2019 (Figure 3). The highest peaks were in August and September.

Figure 2. Distribution of confirmed leptospirosis cases by month, EU/EEA, 2016–2020

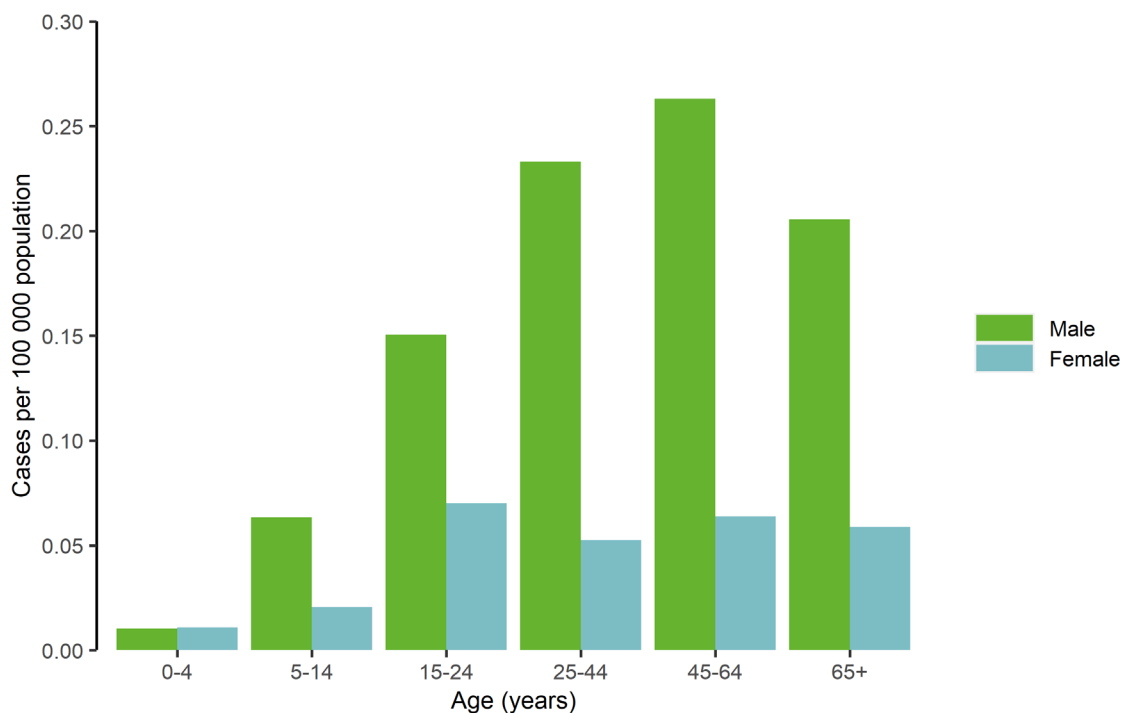
Source: Country reports from Austria, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

Figure 3. Distribution of confirmed leptospirosis cases by month, EU/EEA, 2020 and 2016–2019

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

For 2020, people aged 25–64 years and above accounted for 332 (66%) of 503 confirmed cases with known age. In males, the notification rate increased with age, peaking at 0.26 cases per 100 000 population in males aged 45–64 years, and then decreased in males aged 65 years and above (Figure 4). In females, the notification rate plateaued at approximately 0.05 cases per 100 000 population in females aged 15 years and above. The overall male-to-female rate ratio was 3.9:1.

Figure 4. Distribution of confirmed leptospirosis cases per 100 000 population, by age and gender, EU/EEA, 2020



Outbreaks and other threats

In 2020, no threats related to leptospirosis were reported.

Discussion

Leptospirosis remains a relatively uncommon disease with low case rates in EU/EEA countries. Most cases occur during the summer period – the seasonality probably driven by a combination of environmental factors (e.g. rainfall and high temperatures) and human behaviours (e.g. outdoor activities) [5]. The 2020 notification rate was the lowest observed in the 2016–2020 period but there was no obvious long-term trend. Of note, the seasonality was less pronounced in 2020 compared to previous years with a smaller peak during the summer season.

For 2020 and as in previous years, most confirmed cases were males between 25 and 64 years of age. This population is more likely to be engaged in activities or occupations associated with an increased leptospirosis risk, such as work with exposure to rodents or livestock (e.g. sewer or field worker), or recreational activities in water [5].

The low case numbers of leptospirosis reported for 2020 may be associated with changes in population behaviours and disruptions in surveillance during the COVID-19 pandemic. An analysis of surveillance data from the United States found a 40% decrease in reported cases among food- and waterborne diseases between 2019 and 2020 [6].

Public health implications

Prevention of leptospirosis needs to take into account its complex and dynamic epidemiology, including environmental aspects (e.g. climate), presence of carriers (e.g. rodents), and human behaviours [1].

Prevention of leptospirosis in human starts by reducing the risk of exposure by avoiding contact with water contaminated with animal urine either by not wading or swimming in contaminated water, or wearing protective clothes for those with an occupational risk of exposure to contaminated water.

Treatment and/or vaccination of animal carriers (e.g. dogs) and control of rodents can also help reduce the risk of leptospirosis in humans [1].

Early diagnosis and adequate treatment of cases have been shown to decrease both morbidity and mortality of leptospirosis [1].

References

1. Hartskeerl RA, Collares-Pereira M, Ellis WA. Emergence, control and re-emerging leptospirosis: dynamics of infection in the changing world. *Clin Microbiol Infect.* 2011 Apr;17(4):494-501.
Available from: <https://www.ncbi.nlm.nih.gov/pubmed/21414083>
2. European Centre for Disease Prevention and Control. Introduction to the Annual Epidemiological Report. 2020.
Available from: <https://www.ecdc.europa.eu/en/surveillance-and-disease-data/annual-epidemiological-reports/introduction-annual>
3. European Centre for Disease Prevention and Control. Surveillance systems overview for 2020.
Available from: <https://www.ecdc.europa.eu/en/publications-data/surveillance-systems-overview-2020>
4. European Centre for Disease Prevention Control. Surveillance Atlas of Infectious Diseases - Leptospirosis data. ECDC.
Available from: <https://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=31>
5. Mwachui MA, Crump L, Hartskeerl R, Zinsstag J, Hattendorf J. Environmental and Behavioural Determinants of Leptospirosis Transmission: A Systematic Review. *PLoS Negl Trop Dis.* 2015;9(9):e0003843.
Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26379035>
6. Crane MA, Popovic A, Panaparambil R, Stolbach AI, Romley JA, Ghanem KG. Reporting of Infectious Diseases in the United States During the Coronavirus Disease 2019 (COVID-19) Pandemic. *Clin Infect Dis.* 2022 Mar 9;74(5):901-4.
Available from: <https://www.ncbi.nlm.nih.gov/pubmed/34097015>