

SURVEILLANCE REPORT

Campylobacteriosis

Annual Epidemiological Report for 2020

Key facts

- Campylobacteriosis is the most frequently reported food- and waterborne disease in the EU/EEA.
- In 2020, 29 EU/EEA countries reported 123 062 confirmed cases of campylobacteriosis.
- The overall EU/EEA notification rate was 42.8 cases per 100 000 population.
- Human campylobacteriosis was most common in children under five years of age.
- Campylobacteriosis shows clear seasonality, with a sharp peak of cases in the summer months and a smaller peak at the beginning of the year.

Introduction

Campylobacteriosis is an acute diarrhoeal enteritis mainly caused by one of the two species: *Campylobacter jejuni* or *C. coli*. The incubation period is typically two to five days after infection. The symptoms start with abdominal cramps followed by watery diarrhoea, which is often accompanied by fever, headaches and muscle aches. In about one-third of cases, blood may appear in stools. The infection is usually self-limiting, lasting around a week, but may require hospital care in about 5–10% of cases. If the infection is severe or prolonged, antimicrobial treatment may be needed. The acute infection may lead to rare late-onset complications like reactive arthritis or Guillain-Barré syndrome (GBS), which is an acute neuromuscular paralysis. *Campylobacter* bacteria are common in animals (e.g. poultry, cattle, pigs and wild birds), which can serve as reservoirs without clinical symptoms. Human infection usually occurs via consumption of contaminated food (e.g. poultry meat) or drinking water from private wells. Swimming in natural waters has also been shown as a risk factor for infection.

Methods

This report is based on data for 2020 retrieved from The European Surveillance System (TESSy) on 5 November 2021. 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, refer to the Methods chapter of the 'Introduction to the ECDC Annual Epidemiological Report' [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].

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The notification of campylobacteriosis is mandatory in 24 European Union/European Economic Area (EU/EEA) countries. The notification is voluntary in five countries (Belgium, France, Greece, Italy and the Netherlands) or organised differently (the United Kingdom (UK), for data up to 2019). The surveillance systems for campylobacteriosis have full national coverage in all but four countries (France, Italy, the Netherlands and Spain). The national coverage of the surveillance system in France was estimated to be 20% in 2020; in the Netherlands, it was estimated to be 58% in 2020. These proportions were used when calculating notification rates for these two countries. Estimates of population coverage in Italy and Spain were not provided, so notification rates were not calculated for these two countries. In Luxembourg, laboratory confirmation with PCR was included in the notification system in 2020; this, along with a new electronic laboratory notification system, may have resulted in an increased number of campylobacteriosis notifications. In Belgium, full national coverage was established in 2015 and rates before this date are not displayed. Greece reported data on laboratory-confirmed cases collected from public hospitals from 2018 onwards. All countries reported case-based data except Belgium, Bulgaria and Greece, which reported aggregated data. Both reporting formats were included to calculate numbers of cases, notification rates, disease trends, and age and gender distributions. The completeness of some variables (e.g. outcome or travel history) varied between countries and years; some countries were able to collect and integrate this type of information from different sources, while other countries were not.

The UK contributed surveillance data up to 2019. No data were reported by the UK for 2020 due to its withdrawal from the EU on 31 January 2020. The UK data that were reported up to 2019 are presented in Table 1 but are not included in the analysis.

Epidemiology

For 2020, 29 EU/EEA countries reported 123 062 confirmed cases of campylobacteriosis (Table 1). This represents a reduction of 26.0% compared with 2019 (UK cases excluded). In 2020, Czechia, France and Germany accounted for 58.4% of all confirmed cases. The overall EU/EEA notification rate was 42.8 cases per 100 000 population (range by country: 1.1–163.8). The countries with the highest notification rates were Czechia and Luxembourg. The lowest notification rates were reported in Bulgaria, Cyprus, Greece, Poland and Romania (Figure 1). Compared with 2016, the most notable reductions ($\geq 50\%$) in notification rates were observed in Czechia, Slovakia and Sweden.

Seventeen EU/EEA countries reported the outcome for 69.3% of confirmed campylobacteriosis cases. The number of reported deaths attributed to campylobacteriosis in the EU/EEA increased from 25 in 2016 to 47 in 2020. Of the 47 reported deaths among confirmed cases, 55.3% were observed in the age group 65 years and above. Of the cases with available data ($n = 43\,458$), 22.0% were hospitalised in 2020.

Human cases of reported campylobacteriosis followed a clear seasonality consistent with previous years, with most cases being reported between June and August (Figures 2–3). Small peaks in January were also observed from 2016 to 2020. In 2020, the reported cases by month were below the minimum of the preceding four years (Figure 3).

Table 1. Confirmed campylobacteriosis cases and rates per 100 000 population by country and year, EU/EEA, 2016–2020

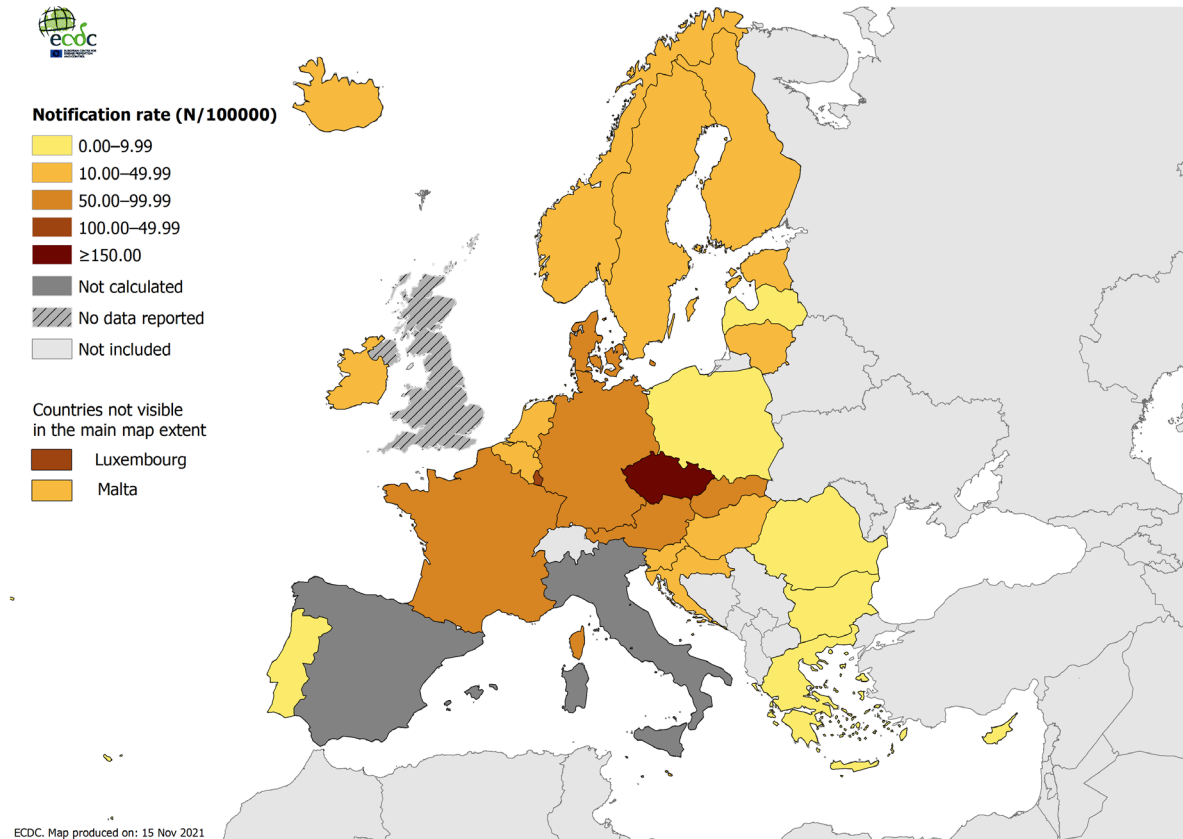
Country	2016		2017		2018		2019		2020		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	ASR
Austria	7 083	81.4	7 204	82.1	7 999	90.7	6 572	74.2	5 406	60.7	62.1
Belgium	10 055	88.9	8 649	76.2	8 086	70.9	7 337	64.0	5 693	49.4	49.0
Bulgaria	202	2.8	195	2.7	191	2.7	229	3.3	127	1.8	2.0
Croatia	1 524	36.4	1 686	40.6	1 965	47.9	1 722	42.2	1 054	26.0	28.3
Cyprus	21	2.5	20	2.3	26	3.0	21	2.4	18	2.0	NRC
Czechia	24 084	228.2	24 326	230.0	22 895	215.8	22 894	215.0	17 517	163.8	170.6
Denmark	4 712	82.6	4 255	74.0	4 559	78.9	5 402	93.0	3 742	64.3	63.7
Estonia	298	22.6	285	21.7	411	31.2	347	26.2	265	19.9	20.5
Finland	4 637	84.5	4 289	77.9	5 099	92.5	4 382	79.4	2 074	37.5	38.2
France	6 698	50.3	6 579	49.2	7 491	55.9	7 712	57.4	7 920	58.8	58.2
Germany	73 736	89.7	69 251	83.9	67 585	81.6	61 277	73.8	46 379	55.8	56.2
Greece	NDR	NRC	NDR	NRC	357	3.3	366	3.4	218	2.0	NRC
Hungary	8 556	87.0	7 807	79.7	7 117	72.8	6 400	65.5	4 461	45.7	48.5
Iceland	128	38.5	119	35.2	145	41.6	136	38.1	95	26.1	26.3
Ireland	2 511	53.1	2 779	58.1	3 044	63.0	2 776	56.6	2 419	48.7	47.7
Italy	1 057	NRC	1 060	NRC	1 356	NRC	1 633	NRC	1 418	NRC	NRC
Latvia	90	4.6	59	3.0	87	4.5	133	6.9	104	5.5	5.6
Liechtenstein	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NRC
Lithuania	1 225	42.4	990	34.8	919	32.7	1 221	43.7	684	24.5	NRC
Luxembourg	518	89.9	613	103.8	625	103.8	271	44.1	729	116.4	116.4
Malta	212	47.1	231	50.2	333	70.0	278	56.3	206	40.0	41.3
Netherlands	3 383	38.3	2 890	32.5	3 091	34.6	3 415	34.1	2 549	25.2	24.9
Norway	2 317	44.5	3 883	73.8	3 668	69.3	4 154	78.0	2 422	45.1	45.2
Poland	773	2.0	874	2.3	719	1.9	715	1.9	414	1.1	1.1
Portugal	359	3.5	596	5.8	610	5.9	887	8.6	790	7.7	9.1
Romania	517	2.6	467	2.4	573	2.9	805	4.1	300	1.6	1.6
Slovakia	7 623	140.5	6 946	127.8	8 339	153.2	7 690	141.1	4 921	90.2	91.4
Slovenia	1 642	79.5	1 408	68.2	1 305	63.1	1 085	52.1	811	38.7	41.2
Spain	15 542	NRC	18 860	NRC	18 410	NRC	9 658	NRC	6 891	NRC	NRC
Sweden	11 021	111.9	10 608	106.1	8 132	80.4	6 693	65.4	3 435	33.3	33.4
United Kingdom	58 901	90.1	63 267	96.1	65 246	98.4	58 718	88.1	NDR	NRC	NRC
EU/EEA	249 425	66.0	250 196	65.0	250 383	64.1	224 929	59.9	123 062	42.8	43.0

Source: Country reports

ASR: age-standardised rate; NDR: no data reported; NRC: no rate calculated.

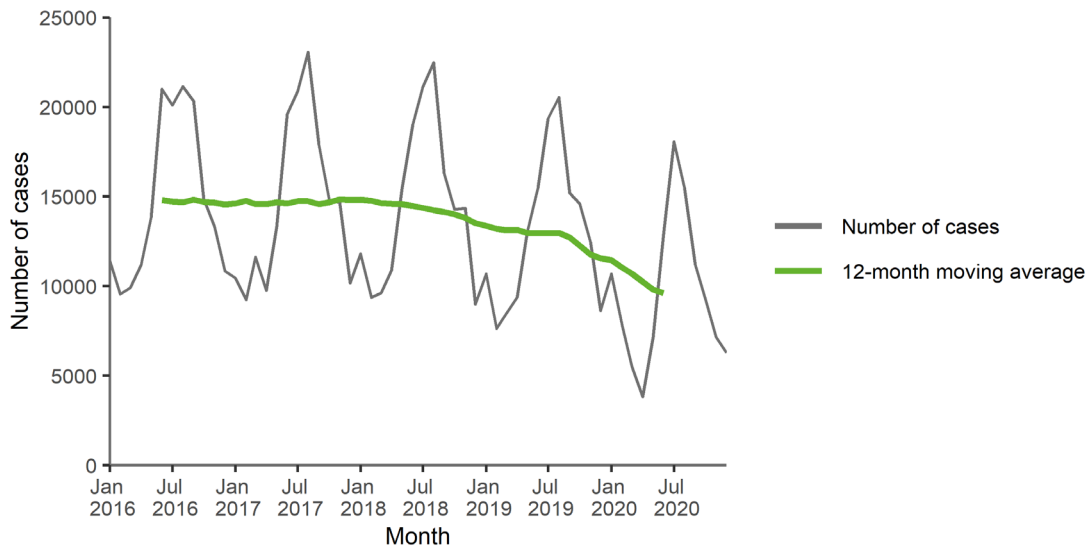
No data were reported by the United Kingdom for 2020 due to its withdrawal from the EU on 31 January 2020.

Figure 1. Confirmed campylobacteriosis cases per 100 000 population by country, EU/EEA, 2020



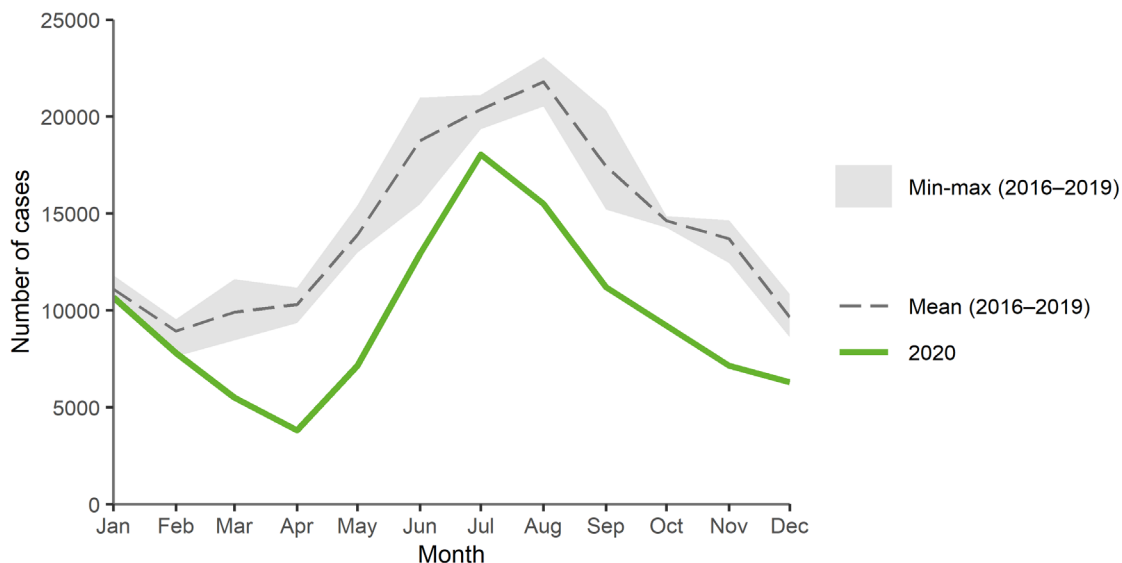
Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom. No rates were calculated for Italy and Spain.

Figure 2. Number of confirmed campylobacteriosis cases by month, EU/EEA, 2016–2020



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

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



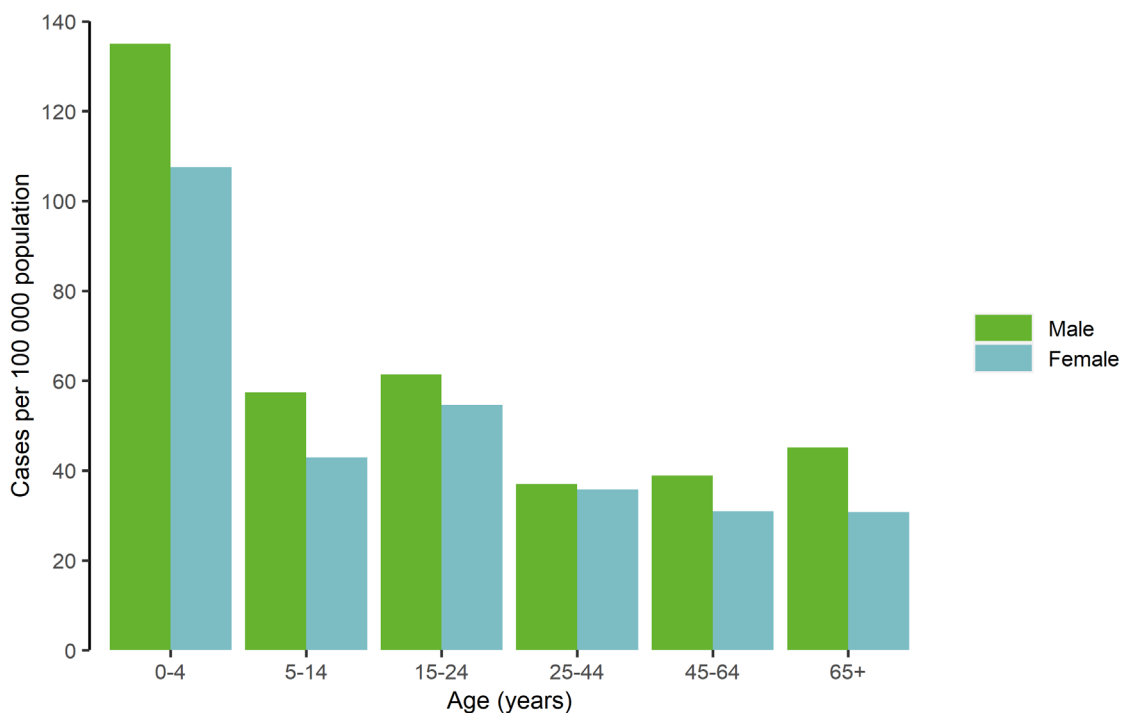
Source: Country reports from Austria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

Age and gender

In 2020, adults between 25 and 64 years of age accounted for 51.9% of the 102 630 confirmed cases with reported age. The notification rate was highest (121.8 cases per 100 000 population; range by country: 16.2–720.8) in children below five years of age.

Higher notification rates were observed in males than females in all six age groups (Figure 4). The overall male-to-female ratio was 1.2:1, like in previous years.

Figure 4. Confirmed campylobacteriosis cases per 100 000 population, by age and gender, EU/EEA, 2020

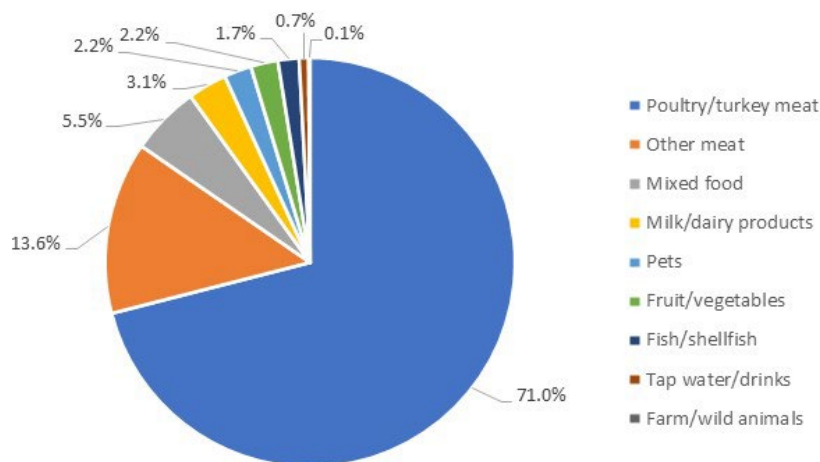


Transmission

Data on transmission route were available for 10.4% (n = 83 978) of the 810 091 cases from 12 EU/EEA countries that reported this information from 2016 to 2020. Food-borne transmission (n = 78 349) was reported for most of these cases (93.3%), followed by much smaller proportions of person-to-person transmission (2.5%), animal contact (1.8%), and exposure to recreational water (0.1%). Among uncommon exposures were healthcare-associated infections (five cases), laboratory exposures (three cases) and transfusion-associated infections (three cases).

Additional data on transmission route/suspected vehicle of infection were reported by 10 EU/EEA countries for 61.9% of the cases (n = 51 941). 'Poultry/turkey meat' was the reported food vehicle for 71.0% of these cases, followed by 'Other meat' (13.6%) and 'Mixed food' (5.5%).

Figure 5. Specified transmission routes/suspected vehicles of infection in campylobacteriosis cases (n = 51 941), EU/EEA, 2016–2020



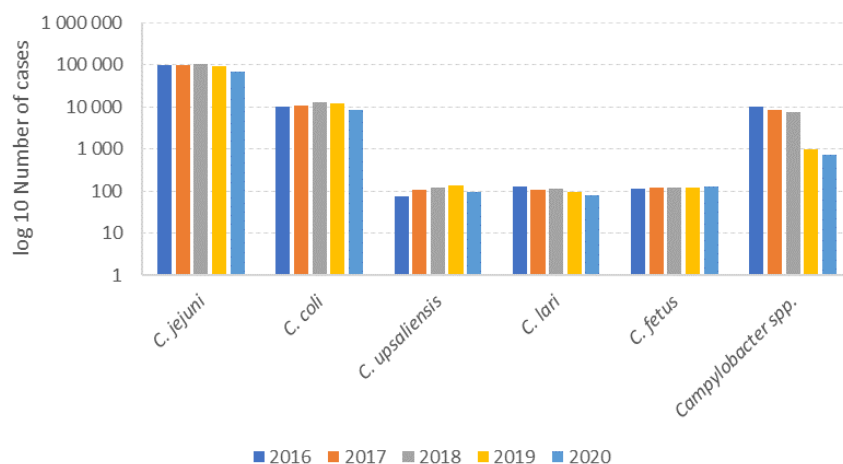
Source: Country reports from Austria, Czechia, Estonia, Iceland, Italy, Lithuania, Malta, Poland, Portugal and Slovakia.

Microbial surveillance

Species

In 2020, *Campylobacter* spp. was reported for 79 368 cases (64.5% of all confirmed cases). Among these cases, most infections were caused by *C. jejuni* (88.2%), followed by *C. coli* (10.5%). The ratio between these two species has stayed about the same over the years. From 2016 to 2020, the number of cases by species decreased in all species categories except for *C. fetus*, which increased slightly from 122 cases in 2019 to 130 cases in 2020 (Figure 5).

Figure 5. Number of confirmed infections by *Campylobacter* species, EU/EEA, 2016–2020



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

Discussion

From 2005 to 2020, *Campylobacter* was the most frequently reported food- and waterborne bacterial pathogen in humans in the EU/EEA [4]. In 2020, the five-year trend showed a decline in the number of cases in Finland, Hungary, Poland, Slovenia and Sweden, whereas Latvia and Italy reported significantly increasing trends during the same period [4]. The overall decreasing trend in the EU/EEA could have been due to the withdrawal of the UK from the EU and decreased travel in the first year of the COVID-19 pandemic [4]. This is particularly the case in Nordic countries, where the highest proportions of infections are usually travel related, acquired outside of cases' home countries [4]. In 2020, the geographical distribution remained the same as in previous years, with most cases (64.0%) in the EU/EEA reported in Czechia, France, Germany and Spain.

The COVID-19 pandemic had a significant impact on campylobacteriosis surveillance data in 2020. Countries reported that lower case numbers could have been due to people not seeking medical care for mild symptoms to avoid exposure to SARS-CoV-2 in healthcare facilities, limited laboratory capacity due to reallocation of resources to pandemic response, fewer restaurant visits, increased hand washing, less travel due to travel restrictions, etc.

As in previous years, children under five years old were most affected by campylobacteriosis in 2020, with an overall notification rate of 121.8 cases per 100 000 population.

Campylobacter has a characteristic seasonality, with a sharp increase in the number of cases from late spring to early autumn. The timing and intensity of the summer peak varies across European countries, with human *Campylobacter* cases associated with higher temperatures [5]. A smaller but distinct winter peak observed in January has become apparent in the past few years [4].

In most countries, poultry meat is a major food source of human campylobacteriosis [6]. The data from 2016 to 2020 support this, as 'Poultry/turkey meat' was most frequently reported as the suspected vehicle of infection. *Campylobacter* colonisation of broiler flocks shows a clear seasonality, especially in northern European countries, with an increased risk for human infections during summer [7]. The poultry reservoir as a whole – including environmental transmission, direct animal contact, and consumption and preparation of poultry meat – is estimated to account for up to 80% of campylobacteriosis cases [6]. Additional identified sources are drinking water that has not been disinfected, wild birds, pets and the environment [6]. Several studies have used multilocus sequence typing (MLST) and whole genome sequencing (WGS) methods to attribute the sources of human *Campylobacter* infections. For example, in France, chicken was found to be an important source and ruminants, the environment and pets were additional sources [8].

Antimicrobial resistance of *Campylobacter* bacteria is a serious concern. In humans, resistance to antibiotics used for treatment of severe infections is reported to be very high, particularly for fluoroquinolones and tetracyclines. Resistance to macrolides was noted at overall very low levels in 2020, though it was markedly higher in *C. coli* than *C. jejuni* [9].

Public health implications

Campylobacteriosis is the most frequently reported food- and waterborne disease in the EU/EEA with high morbidity. The very high proportion of resistance to fluoroquinolones, which are critically important antimicrobials for treatment, may have implications for treatment of severe *Campylobacter* infections [10]. Handling, preparing and consuming broiler meat is estimated to account for 20–30% of all human cases [6]. Proper kitchen hygiene is required to avoid infection and cross-contamination between raw poultry meat and ready-to-eat/prepared food.

The elimination of *Campylobacter* in poultry production is challenging, requiring a combination of different strategies in the food chain to reduce the risk of infection in humans [11].

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