

SURVEILLANCE

Giardiasis

Annual Epidemiological Report for 2022

Key facts

- In 2022, 10 894 confirmed giardiasis cases were reported in the European Union/European Economic Area (EU/EEA).
- The EU/EEA notification rate was 3.9 cases per 100 000 population. The highest notification rates were reported in Luxembourg, Belgium and Spain.
- The highest notification rate per 100 000 population was observed in the age group 0–4 years (14.6 cases for males and 13.3 cases for females).
- In 2022, the EU/EEA notification rate of confirmed giardiasis cases showed evidence of a progressive resurgence of cases following the COVID-19 pandemic.

Introduction

Giardiasis is a common parasitic infection worldwide, caused by the protozoan *Giardia lamblia* (syn. *G. duodenalis*, *G. intestinalis*). *Giardia* spp. live in the intestines of humans and animals. The parasite spreads through durable cysts that are excreted in the hosts' faeces. These cysts can persist in the environment for several months.

The disease may be asymptomatic and self-limiting, or lead to symptoms (3–25 days after infection) such as fatigue, bloating, acute diarrhoea, stomach pain and nausea. Prolonged disease can lead to chronic gastrointestinal symptoms such as nutrient malabsorption [1]. Infection commonly occurs via ingestion of cysts found in contaminated surface water (e.g. via water-themed recreational activities, swimming pools or drinking water) or through consumption of contaminated food. Faecal-oral transmission is possible through contaminated surfaces (hands or fomites). Person-to-person transmission, e.g. through sexual transmission [2] or poor hygiene practices [3], may also occur.

Methods

This report is based on data for 2022 retrieved from The European Surveillance System (TESSy) on 5 February 2024. 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' [4]. An overview of the national surveillance systems is available online [5]. A subset of the data used for this report is available through ECDC's online 'Surveillance atlas of infectious diseases' [6].

In 2022, 24 EU/EEA countries (22 EU Member States plus Iceland and Norway) reported giardiasis data, 23 of which had national coverage. Fifteen countries used the latest case definition (EU 2018), while three used the case definition from 2012 and four from 2008. Two countries reported using another case definition. Most countries (22/24) undertook passive surveillance and in 16 countries cases were reported by both laboratories and physicians or hospitals. Twenty countries reported case-based data.

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Notification rates and age-standardised rates were not calculated for Romania because its national surveillance system did not cover the whole population and no coverage data were provided. No data from 2020 onwards were reported by the United Kingdom (UK), due to its withdrawal from the EU on 31 January 2020.

Information from event-based surveillance for giardiasis clusters or outbreaks with a potential EU dimension was collected through [EpiPulse](#).

Epidemiology

For 2022, 24 EU/EEA countries reported data on giardiasis, with a total of 10 894 confirmed cases reported. No country reported zero cases. The EU/EEA notification rate for 2022 was 3.9 cases per 100 000 population. The highest number of confirmed cases was reported by Spain, followed by Germany. These two countries accounted for 46.6% of all confirmed giardiasis cases in the EU/EEA. Luxembourg had the highest notification rate (18.9 cases per 100 000 population), followed by Belgium (13.0 cases) and Spain at (7.6 cases) (Table 1, Figure 1).

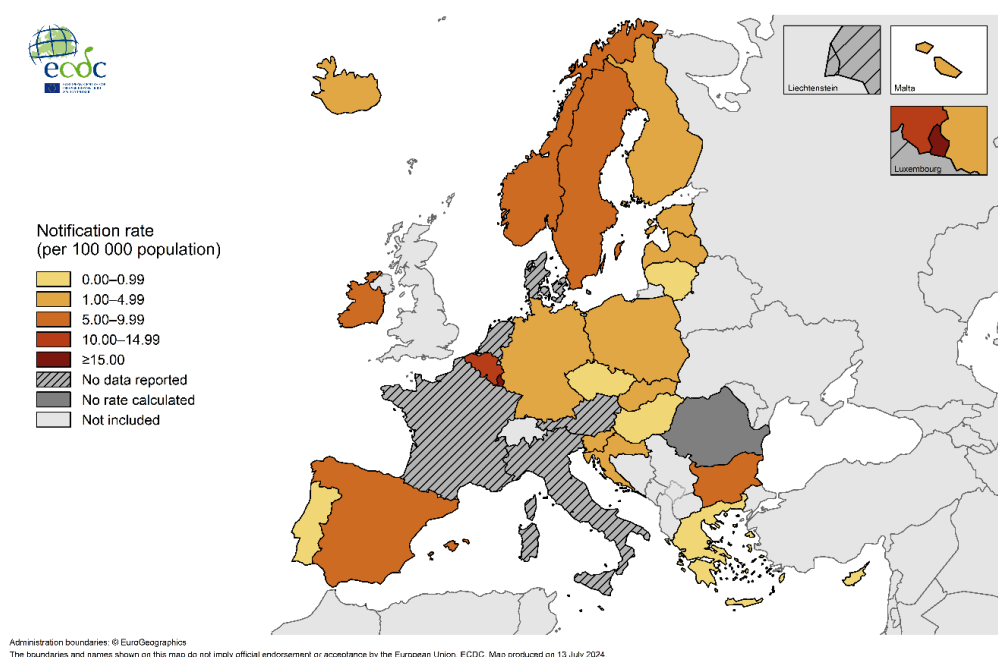
Among the 4 656 cases with information on travel status, the majority (76.0%) were domestically acquired. However, in Sweden and Iceland, 73–100% of cases were travel associated.

Table 1. Confirmed giardiasis cases and rates per 100 000 population by country and year, EU/EEA, 2018–2022

Country	2018		2019		2020		2021		2022	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Belgium	2 376	20.8	2 062	18.0	1 384	12.0	1 042	9.0	1 514	13.0
Bulgaria	1 058	15.0	1 141	16.3	500	7.2	591	8.5	503	7.4
Croatia	50	1.2	62	1.5	34	0.8	40	1.0	39	1.0
Cyprus	3	0.3	2	0.2	0	0.0	2	0.2	2	0.2
Czechia	34	0.3	50	0.5	21	0.2	14	0.1	22	0.2
Denmark	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Estonia	107	8.1	121	9.1	86	6.5	44	3.3	15	1.1
Finland	291	5.3	296	5.4	211	3.8	133	2.4	171	3.1
France	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Germany	3 407	4.1	3 290	4.0	1 665	2.0	1 308	1.6	1 779	2.1
Greece	61	0.6	51	0.5	29	0.3	42	0.4	26	0.2
Hungary	59	0.6	56	0.6	61	0.6	53	0.5	84	0.9
Iceland	25	7.2	16	4.5	8	2.2	15	4.1	17	4.5
Ireland	271	5.6	253	5.2	160	3.2	160	3.2	260	5.1
Italy	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Latvia	92	4.8	64	3.3	39	2.0	36	1.9	34	1.8
Liechtenstein	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Lithuania	18	0.6	18	0.6	11	0.4	6	0.2	14	0.5
Luxembourg	0	0.0	3	0.5	93	14.9	81	12.8	122	18.9
Malta	6	1.3	2	0.4	10	1.9	5	1.0	21	4.0
Netherlands	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Norway	465	8.8	578	10.8	299	5.6	265	4.9	331	6.1
Poland	928	2.4	781	2.1	357	0.9	557	1.5	1 340	3.6
Portugal	34	0.3	43	0.4	31	0.3	48	0.5	62	0.6
Romania	1 270	NRC	1 089	NRC	8	NRC	339	NRC	500	NRC
Slovakia	156	2.9	146	2.7	102	1.9	100	1.8	106	2.0
Slovenia	47	2.3	39	1.9	18	0.9	33	1.6	37	1.8
Spain	3 536	NRC	1 633	NRC	762	NRC	1 679	3.9	3 298	7.6
Sweden	1 252	12.4	1 102	10.8	670	6.5	660	6.4	597	5.7
EU/EEA (30 countries)	15 546	4.7	12 898	4.5	6 559	2.5	7 253	2.6	10 894	3.9
United Kingdom	5 510	8.3	5 105	7.7	NDR	NRC	NA	NA	NA	NA
EU/EEA (31 countries)	21 056	5.6	18 003	5.2	6 559	2.5	NA	NA	NA	NA

Source: Country reports.

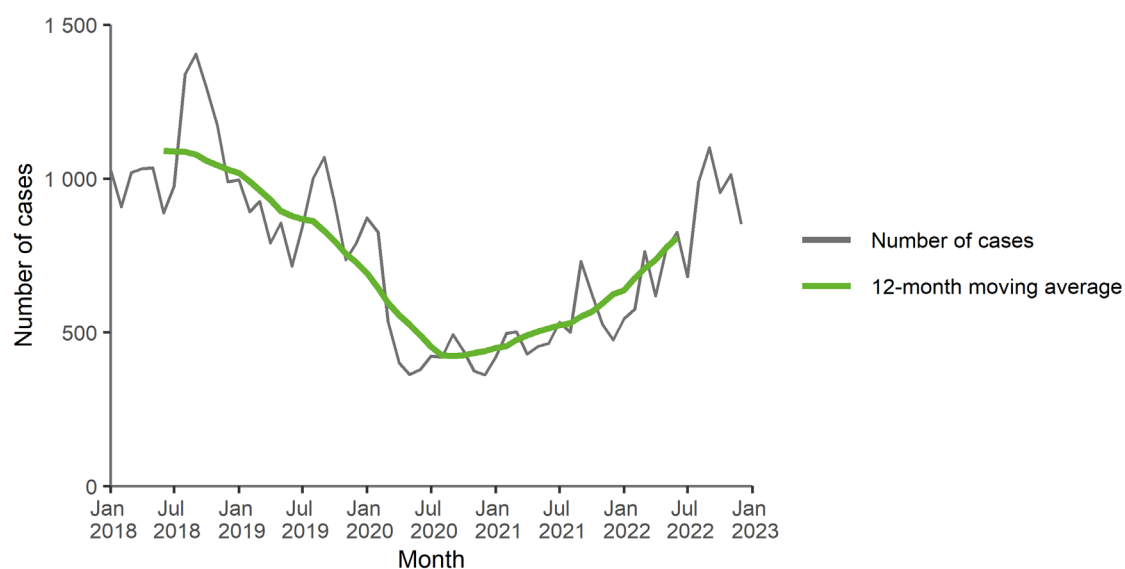
NA: not applicable; NDR: no data reported; NRC: no rate calculated.

Figure 1. Confirmed giardiasis cases per 100 000 population by country, EU/EEA, 2022

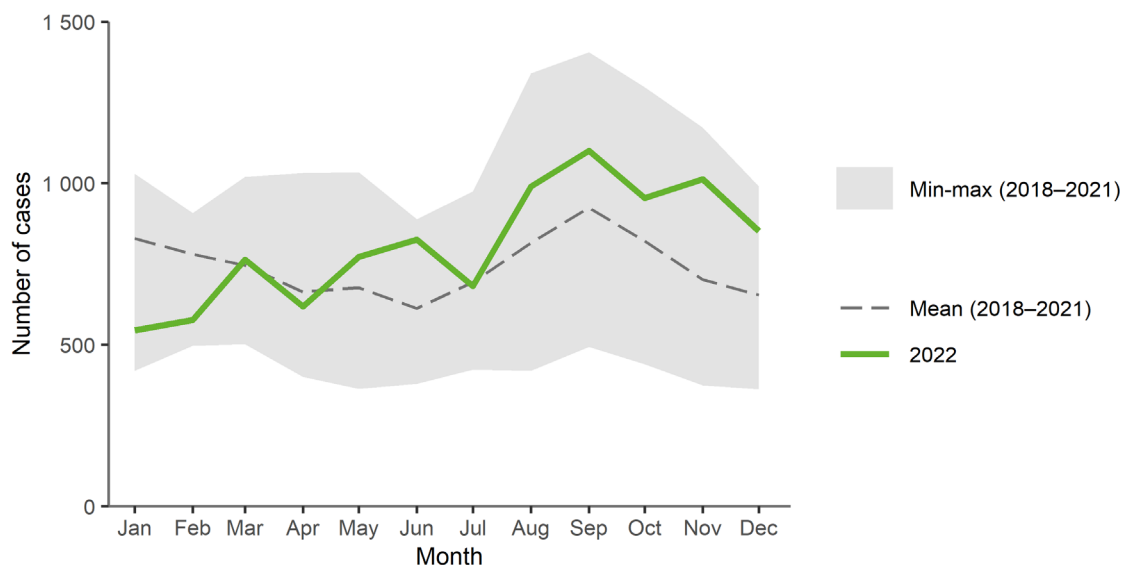
Source: Country reports

The number of confirmed giardiasis cases in the EU/EEA increased in 2021 and 2022. This followed the substantial drop in cases observed in 2020, which was likely due to the COVID-19 pandemic. The number of confirmed giardiasis cases in 2022 is comparable to the pre-pandemic levels observed in 2019 (Figure 2).

In the EU/EEA, giardiasis usually has a seasonal pattern, with a larger peak in cases around September. In 2022, case numbers were highest in September and November, but smaller peaks were also observed in March and June (Figure 3).

Figure 2. Confirmed giardiasis cases by month, EU/EEA, 2018–2022

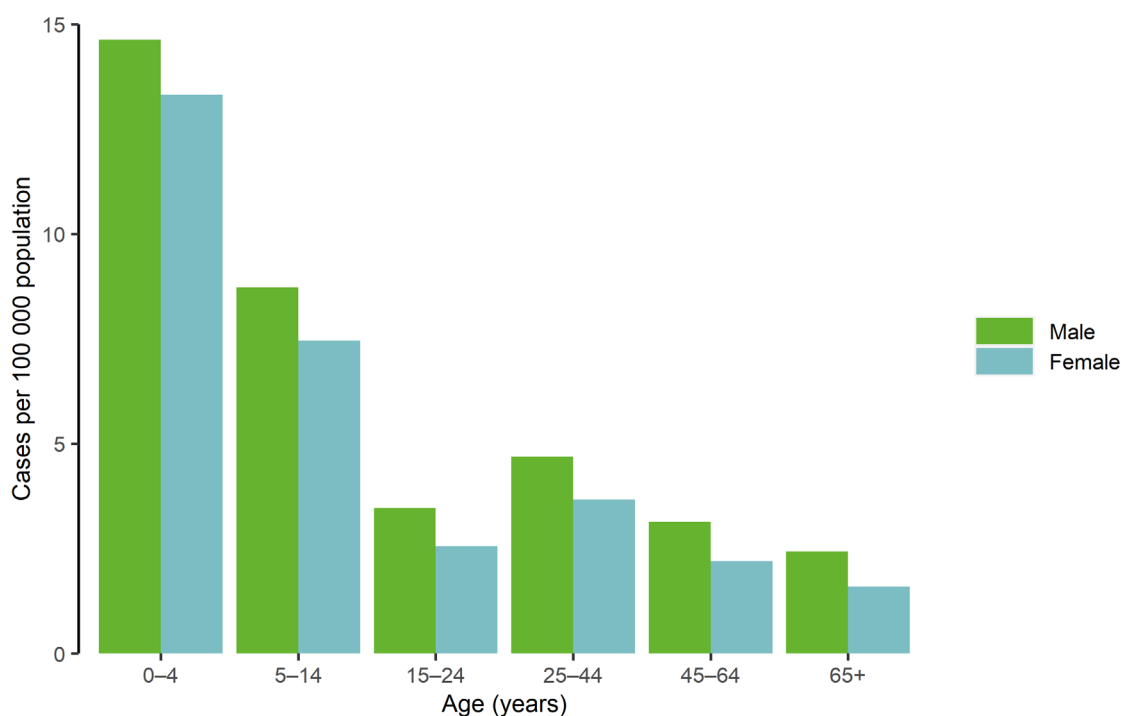
Source: Country reports from Belgium, Cyprus, Czechia, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Latvia, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Spain and Sweden.

Figure 3. Confirmed giardiasis cases by month, EU/EEA, 2022 and 2018–2021

Source: Country reports from Belgium, Cyprus, Czechia, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Latvia, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Spain and Sweden.

Age and gender

Of the 10 334 confirmed cases with information on gender, 56% were males and 44% were females (male-to-female ratio: 1.3:1), with males overrepresented in every age group (Figure 4). The highest notification rate per 100 000 population was detected in the age group 0–4 years (14.6 cases for males and 13.3 cases for females). This age group accounted for 1 897 (17.5%) of the 10 846 cases with information on age. The notification rate per 100 000 population decreased with age and was lowest in individuals 65 years old and above (2.4 cases in males and 1.6 cases in females).

Figure 4. Confirmed giardiasis cases per 100 000 population, by age and gender, EU/EEA, 2022

Source: Country reports from Belgium, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

Outbreaks and other threats

No national or multi-country giardiasis outbreaks were reported in EpiPulse in 2022.

Discussion

Giardiasis is the most commonly reported of the five food- and waterborne parasitic diseases under mandatory EU surveillance. Surveillance of giardiasis covers the entire population in most EU/EEA countries. Six EU/EEA countries do not have surveillance systems for giardiasis and do not report cases. Some studies suggest that giardiasis is under-reported in several countries and possibly throughout the EU/EEA [7].

In 2022, the number of confirmed giardiasis cases in the EU/EEA increased, indicating a gradual resurgence following the COVID-19 pandemic. Belgium and Luxembourg continued to report the highest notification rates for giardiasis in the EU/EEA. Luxembourg reported large increases in the number of cases per year from 2020 onwards. This was due to a change in their notification system, which began to include all electronic laboratory reports in 2020. Previously, notifications were based on reports from general practitioners only¹.

Giardiasis is caused by the protozoan *Giardia lamblia* (synonymous *G. duodenalis*, *G. intestinalis*). *G. lamblia* organisms have been subclassified using molecular typing into eight genetic assemblages (designated A–H), but only two of them (A and B) usually infect humans [8]. Assemblage-specific risk factors and routes of transmission were also found. In the UK, dog ownership was a risk factor for subtype A infection, while contact with young children was predominantly associated with subtype B infections, found to cause more severe clinical outcomes [8]. A recent study conducted on outbreak isolates in New Zealand found that infections were often mixed and had a high genetic diversity [9]. *G. lamblia* also infects other mammalian hosts and has zoonotic potential. Studies in Slovakia detected the first human cases linked to dog-specific assemblage C and cat-specific assemblage F in Europe [10].

Human infection occurs most frequently via ingestion of contaminated food or water, including recreational water exposure [3,8]. A recent scoping review found that the consumption of contaminated water and contact with young children were the most common transmission routes in high-income settings [11]. Recent studies conducted in Italy and Portugal reported contamination of ready-to-eat products, such as salads and berries [12,13].

The seasonal pattern of giardiasis observed in 2022 could be related to population behaviour [14]. In countries where seasonality was pronounced, peaks corresponded with holiday periods and could be linked to transmission in children through recreational waters or in daycare centres after returning from holidays.

In many countries, there may be a misconception that infections are largely associated with foreign travel. In most EU/EEA countries, however, most cases with known probable country of infection were domestically acquired. In two Nordic countries (Iceland and Sweden), cases were mostly associated with travel outside the EU. Sweden, which had the fifth-highest notification rate in the EU/EEA, reported over 70% of cases as infected abroad.

Public health implications

Giardiasis remains the most commonly reported food- and waterborne parasitic disease in the EU/EEA. More studies are needed to understand the epidemiology and determinants of this disease and its long-term outcomes. Parasites have complex lifecycles, often with long incubation periods and asymptomatic or subclinical manifestations, making diagnosis based on clinical symptoms alone challenging. All human stool samples submitted for diagnostic testing, irrespective of travel history, should be screened for *Giardia* cysts to enable proper reporting of locally acquired cases. Laboratories should have adequate methods to confirm suspected cases.

While characterisation in parasitology is not as well developed as in bacteriology or virology, several studies have documented the added value of molecular techniques. The use of advanced molecular characterisation in giardiasis diagnostics, such as MLST, would enable a more granular subtyping of isolates, which could be useful for epidemiological studies of outbreaks [15]. Considering the high likelihood of under-reporting and under-ascertainment, giardiasis is a public health concern because of the occurrence of drug-resistant *Giardia* spp. and their potential to cause outbreaks. There is also potential for climate change to increase the spread of the disease[16].

¹ Personal communication, J. Mossong, Ministère de la Santé et de la Sécurité Sociale, Luxembourg, 9 July 2021.

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