

SURVEILLANCE REPORT

Annual Epidemiological Report for 2021

Brucellosis

Key facts

- In 2021, 165 confirmed brucellosis cases were reported in the EU/EEA.
- The notification rate in the EU/EEA was 0.04 cases per 100 000 population. The highest number of cases were reported in Italy, Spain, Greece and France.
- After a significant decline in notification rates in 2020, primarily because of the COVID-19 pandemic, the EU/EEA notification rate increased slightly in 2021.
- The highest rates were detected in age-group 45–64-year-old in both genders (0.06 and 0.03 per 100 000 population in males and in females, respectively)

Introduction

Brucellosis is an infection caused by *Brucella* bacteria. Brucellosis occurs worldwide with the Mediterranean region particularly affected. Humans can get the disease when they are in contact with infected animals (sheep, goats, cattle, pigs and dogs) or contaminated animal products (unpasteurised milk and dairy products or undercooked meat). The symptoms are both general (fever, weakness, joint pain) and organ-specific (including infections in the brain and heart valves). Untreated, brucellosis can become chronic or lead to death.

Methods

This report is based on data for 2021 retrieved from The European Surveillance System (TESSy) on 09 October 2022. 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, please 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 2021, brucellosis data were reported by 29 EU/EEA countries. In Denmark, brucellosis is neither notifiable nor under surveillance. The notification of brucellosis is mandatory in all reporting EU/EEA countries except for Belgium, where notification is based on another (not specified) system.

Suggested citation: European Centre for Disease Prevention and Control. Brucellosis. In: ECDC. Annual epidemiological report for 2021. Stockholm: ECDC; 2023.

Stockholm, March 2023

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Fifteen Member States used the latest case definition (EU 2018), five used the previous case definition from 2012, five reported in accordance with the one from 2008 and four reported using other definitions or did not specify which case definition they used. The majority of Member States (26) undertook passive surveillance and 21 countries had surveillance systems that integrated laboratory and epidemiological data from physicians or hospitals. The surveillance systems for brucellosis have national coverage in all reporting EU/EEA countries. For 2020-2021, Spain did not receive data from all regions which normally report, and the case numbers are therefore lower than expected and no notification rate was calculated. Twenty-eight Member States reported case-based data and Bulgaria reported aggregated data. Both reporting formats were included in the analyses. No data were reported for 2020–2021 by the United Kingdom due to their withdrawal from the EU on 31 January 2020.

Epidemiology

In 2021, 165 confirmed cases of brucellosis were reported by 29 EU/EEA countries with an overall rate of 0.04 per 100 000 population. Twelve Member States reported no cases. Italy, Spain, Greece and France reported the highest numbers of confirmed cases, accounting for 67% of all cases reported in the EU/EEA. Greece had the highest rate at 0.22 per 100 000 population, followed by Slovakia with 0.11 per 100 000 population, and Portugal, and Sweden with 0.10 per 100 000 population each (Table 1, Figure 1). In Sweden, all cases with information on importation were travel related. Luxembourg and Cyprus reported one confirmed case each, but the low population in these two countries resulted in relatively high notification rates (0.16 and 0.11 cases per 100 000 population, respectively).

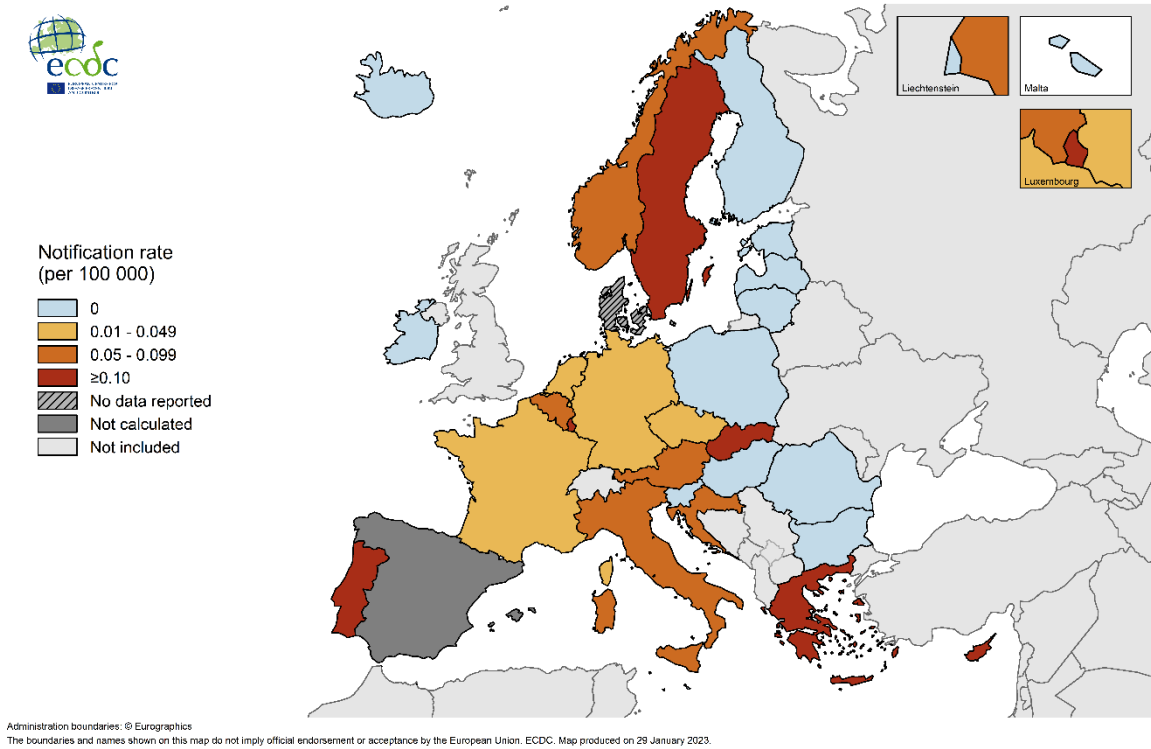
Information on hospitalisation status was provided by 11 countries for 38% (63/165) of confirmed brucellosis cases. Of the cases with known hospitalisation status, the majority (62%; 39/63) were hospitalised. No fatal cases were reported.

Table 1. Number of confirmed brucellosis cases and notification rates per 100 000 population by country and year, EU/EEA, 2017–2021

Country	2017		2018		2019		2020		2021		ASR
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	
Austria	6	0.07	7	0.08	6	0.07	8	0.09	6	0.07	0.07
Belgium	8	0.07	9	0.08	3	0.03	4	0.03	7	0.06	0.06
Bulgaria	2	0.03	1	0.01	0	0.00	1	0.01	0	0.00	0.00
Croatia	1	0.02	3	0.07	3	0.07	1	0.02	2	0.05	0.05
Cyprus	0	0.00	0	0.00	0	0.00	0	0.00	1	0.11	0.11
Czechia	1	0.01	4	0.04	4	0.04	0	0.00	1	0.01	0.01
Denmark	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Estonia	0	0.00	1	0.08	1	0.08	0	0.00	0	0.00	0.00
Finland	1	0.02	0	0.00	0	0.00	0	0.00	0	0.00	0.00
France	21	0.03	0	0.00	34	0.05	19	0.03	21	0.03	0.03
Germany	41	0.05	37	0.04	36	0.04	19	0.02	13	0.02	0.01
Greece	94	0.87	97	0.90	65	0.61	30	0.28	24	0.22	0.22
Hungary	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Iceland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Ireland	2	0.04	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Italy	99	0.16	94	0.16	49	0.08	18	0.03	32	0.05	0.05
Latvia	0	0.00	0	0.00	0	0.00	1	0.05	0	0.00	0.00
Liechtenstein	ND	ND	ND	ND	ND	ND	ND	ND	0	0.00	0.00
Lithuania	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Luxembourg	0	0.00	0	0.00	0	0.00	0	0.00	1	0.16	0.15
Malta	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Netherlands	2	0.01	5	0.03	7	0.04	2	0.01	2	0.01	0.01
Norway	3	0.06	3	0.06	4	0.08	2	0.04	3	0.06	0.05
Poland	2	0.01	0	0.00	2	0.01	0	0.00	1	0.00	0.00
Portugal	16	0.16	19	0.18	33	0.32	9	0.09	10	0.10	0.10
Romania	3	0.02	1	0.01	1	0.01	0	0.00	0	0.00	0.00
Slovakia	1	0.02	0	0.00	1	0.02	2	0.04	6	0.11	0.10
Slovenia	1	0.05	3	0.15	6	0.29	1	0.05	0	0.00	0.00
Spain	63	0.14	40	0.09	20	0.04	10	NR	25	NR	NR
Sweden	14	0.14	11	0.11	14	0.14	7	0.07	10	0.10	0.10
United Kingdom	ND	ND	ND	ND	24	0.04	ND	ND	ND	ND	ND
EU-EEA	381	0.09	335	0.08	313	0.06	134	0.03	165	0.04	0.03

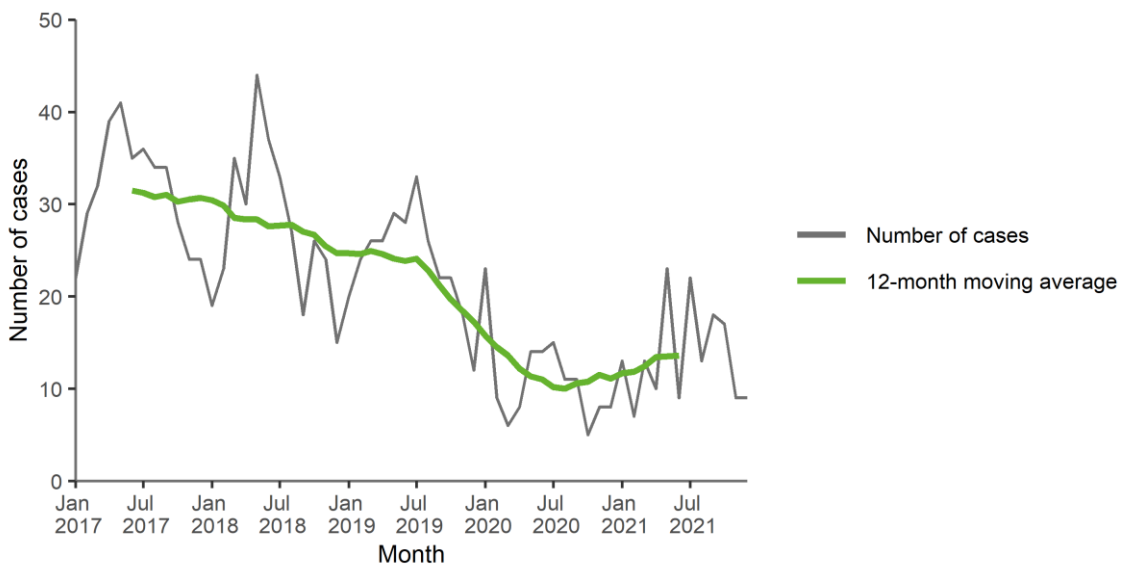
Source: Country reports.
 ASR: age-standardised rate.
 ND: no data reported.
 NR: no rate calculated.

Figure 1. Number of confirmed brucellosis cases per 100 000 population by country, EU/EEA, 2021



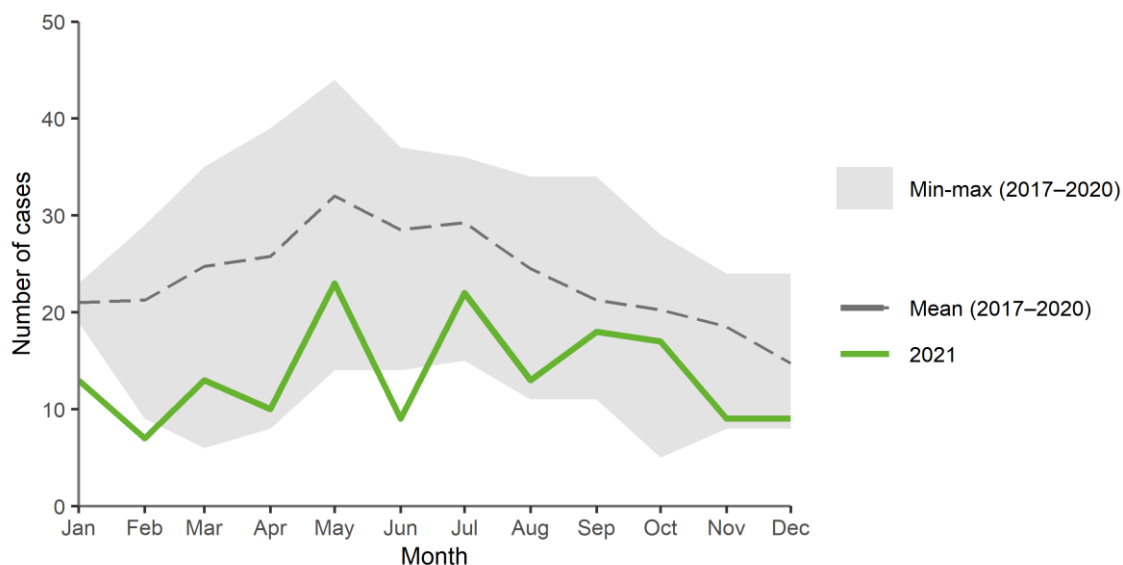
The number of brucellosis cases at the EU/EEA level decreased from 2017 to 2020 but increased slightly in 2021 (Figure 2). In 2021, the lowest number of cases was reported in February and fewer cases were reported in all months compared to the mean of the previous four years (Figure 3). As in previous years, cases peaked in May and July (Figure 3).

Figure 2. Number of confirmed brucellosis cases by month, EU/EEA, 2017–2021



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

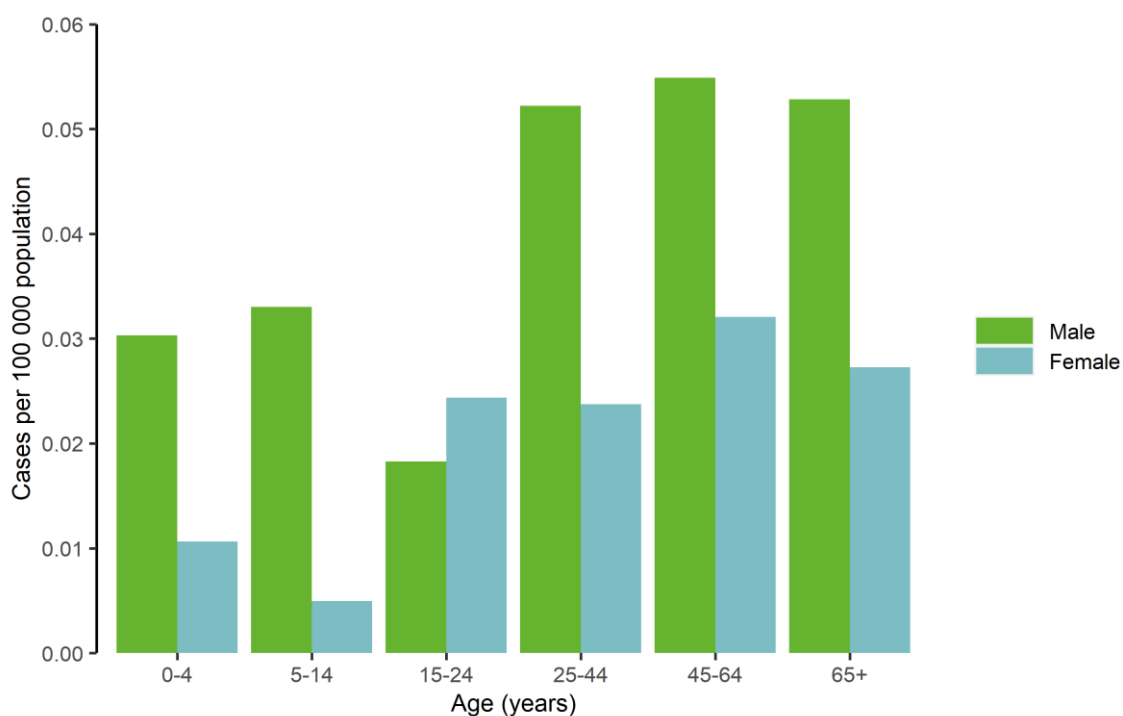
Figure 3. Number of confirmed brucellosis cases by month, EU/EEA, 2021 and 2017–2020



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

Gender was reported for all confirmed brucellosis cases: 61% were males and 39% were females, corresponding to a male-to-female ratio of 1.5:1. More males than females were reported in all age groups except for 15-24 years. The notification rate increased with age from 0.02 per 100 000 population in all age-groups below 24 years to 0.04 in persons aged 25 years and over. By gender, the highest rates were detected in the 45–64-year-old age group in both genders (0.06 and 0.03 per 100 000 population in males and in females, respectively) (Figure 4).

Figure 4. Number of confirmed brucellosis cases per 100 000 population, by age and gender, EU/EEA, 2021



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

Outbreaks and other threats

In the summer of 2021, there was a transition from the Epidemic Intelligence Information System for Food and Waterborne Diseases (FWD-EPIS) to the new EpiPulse system for the reporting of outbreaks/unusual events of food- or waterborne diseases. No national or multicounty brucellosis outbreaks were reported through EpiPulse in 2021.

Discussion

Brucellosis remains a rare but severe disease in the EU/EEA, with the majority of cases hospitalised. The overall trend of reported brucellosis cases has steadily decreased from 2017 to 2020. The COVID-19 pandemic significantly impacted the number of reported cases of brucellosis in 2020, with case numbers decreasing to their lowest level since the beginning of EU-level surveillance in 2007. Reasons mentioned by countries which may explain lower case numbers were e.g. people not seeking medical care due to the risk of exposure to COVID-19 in healthcare facilities, limited laboratory capacity due to reallocation of resources to SARS-CoV-2 testing, movement restrictions and less travel abroad due to travel restrictions during the pandemic. In 2021, the number of cases and notification rate slightly increased but did not reach the pre-pandemic level.

As in previous years, the highest rate of domestically-acquired cases in the EU/EEA in 2021 was reported by Greece, where the notification rate was five times higher than the EU/EEA average. However, a decreasing trend of brucellosis rate was observed in Greece from 2005 to 2018 and a sharp decline in the notification rate was reported in 2019 and then in 2020-2021. As control and eradication programs did not substantially change during the same period, the decrease was probably mainly because of the consequence of the COVID-19 pandemic [5].

Italy, Spain and France reported the highest number of cases and together with Greece accounted for the majority of the brucellosis cases reported in the EU/EEA in 2021. An overall decrease of cases was notified in Italy and Spain in the last 20 years, but brucellosis remains an important health problem, particularly in some of their regions. In Italy, 89% of the annual cases are reported in the southern part of the country [6]. In Spain, the highest incidence was observed in interior regions with the highest livestock density [7]. In France, the number of reported cases has been stable for the last 15 years and since the beginning of EU-level surveillance in 2007 [3].

In Portugal, the notification rate has been decreasing since 2009, even though *Brucella* still represents an ongoing public health threat with the notification rate two times higher than the EU/EEA average. Greece, Italy, Spain and Portugal have not yet obtained the status of being officially free from bovine or ovine and caprine brucellosis. Despite all elimination efforts in animals, brucellosis remains an endemic disease in humans in these countries [8].

A large proportion of cases occurred in working-age males, possibly indicating occupational exposure. Persons working with farm animals, including farmers, livestock breeders, butchers, abattoir workers and veterinarians, are known to be at increased risk of brucellosis, which remains the predominant occupational disease throughout the world [9]. Food-borne exposure is normally limited to persons consuming unpasteurised milk, dairy products or undercooked meat and is often the result of consuming food products from countries where brucellosis is endemic in animals.

Bovine brucellosis, as well as ovine and caprine brucellosis, has been widely eradicated by most EU Member States. As a result, brucellosis has become rare in northern and western Europe, where most of the cases are linked to travel outside the EU. Disease incidence may also be elevated among migrants who have recently arrived from geographic areas where brucellosis is endemic, such as the Middle East and parts of Africa, Asia and Central and South America [10,11].

Public health implications

In Member States that are not free from ovine and caprine or bovine brucellosis, EU-co-funded national brucellosis eradication programmes are important for reducing brucellosis in animals. Besides efforts to control brucellosis in animals, organised prevention efforts and raised awareness are needed within the occupational health framework. The migration of persons from endemic areas may cause an increase in the number of cases in countries where brucellosis was not previously prevalent. Physicians and diagnosing laboratories should be aware of the symptoms of the disease, which is caused by highly pathogenic bacteria. Information on occupational and travel history should be consistently collected as part of brucellosis surveillance in humans. The isolation of antibiotic-resistant *Brucella* strains highlights emerging challenges for treatment.

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