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## 5. Infection with *Mycobacterium tuberculosis* complex (focusing on *Mycobacterium bovis* and *Mycobacterium caprae*)

### Human cases [EU, 2023]

Notification rate (per 100,000 population) **0.04**

**138** Cases of illness

**67** Infections acquired in the EU

**NA** Hospitalisations

**62** Infection acquired outside the EU

**19** Deaths\*

**9** Unknown travel status or unknown country of infection

\* Data refers to 2022

■ ECDC data

### Foodborne outbreaks & related cases [EU, 2023]

**1** Foodborne outbreak\*\*

**3** Cases of illness

**1** Weak-evidence outbreak ■

\*\* No information on the *Mycobacterium* species was provided

■ EFSA data

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The summary data which make up this chapter, as well as additional information on related projects and internet sources, are published for this report on the EFSA Knowledge Junction at Zenodo here. Summary statistics on human surveillance data with downloadable files are retrievable using the ECDC Surveillance Atlas of Infectious Diseases available [here](#).

For additional information about zoonotic tuberculosis focusing on *Mycobacterium bovis* and *M. caprae* and for the consultation of data collected, the following interactive tools are available:



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### 5.1. Key facts

- In 2023, the percentage of zoonotic tuberculosis cases in humans out of total number of tuberculosis cases in humans in the EU/EEA countries was 0.35%. There were 138 confirmed cases of human tuberculosis due to *Mycobacterium bovis* or *Mycobacterium caprae*, corresponding to an EU notification rate of 0.04 cases per 100,000 population. This resulted in a notification decrease in the EU of 6.1% compared with 2022.
- In 2023 and 2022, the number of cases of human tuberculosis due to *M. bovis* or *M. caprae* in the EU remained higher than during the pandemic years 2020 and 2021. In 2023, the number of human cases among the 25 MSs exceeded the number of cases reported in 2019.
- In 2023, the *M. bovis* and *M. caprae* case notification rate was 0.03 cases per 100,000 among EU MSs with disease-free status and 0.05 cases per 100,000 in EU MSs with non-disease-free status for the bovine population.
- The majority of *M. bovis* and *M. caprae* cases in humans (48.6%) were of EU origin (native cases and/or cases originating from other MSs).

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- In bovine animals, in 2023, the overall prevalence of tuberculosis (0.57%) due to *M. bovis* or *M. caprae* decreased slightly compared with the previous year (0.61%), and the number of infected cattle herds in the European Union decreased from 9845 to 8821 herds.
  - Similar to previous years, the distribution of infected herds was heterogeneous and spatially clustered, with a national herd-level prevalence ranging from <0.01% (Austria, Germany, Poland, Romania) to 7.2% (the United Kingdom (Northern Ireland)).
  - Seventeen Member States had the disease-free status in 2023. Ten Member States, along with the United Kingdom (Northern Ireland), were under an eradication programme, of which three Member States (Italy, Portugal and Spain) had disease-free status zones.
  - In the disease-free status zones, a total of 162 cattle herds (0.02%) were reported to be infected with the *Mycobacterium tuberculosis* complex, 13 more compared to 2022, confirming that infection occurs rarely in these areas.
  - In the zones under an eradication programme 8659 cattle herds (1.5% of the total) tested positive for *Mycobacterium tuberculosis* complex in 2023, a 10.7% decrease from 9,696 herds in 2022. The United Kingdom (Northern Ireland) (7.2%), Ireland (4.8%) and Spain (3.2%) were the only countries with a prevalence higher than 1%. No positive herds were reported by Bulgaria, Cyprus or Malta. Over the last decade (2014–2023), the total number of positive cattle herds in UEP zones decreased by 49.4%, largely due to the withdrawal of the United Kingdom from the EU in 2020.

46 **5.2. Surveillance and monitoring of tuberculosis due to *Mycobacterium***

47 ***bovis* or *Mycobacterium caprae* in the EU**

48 **5.2.1. Humans**

49 The notification of tuberculosis in humans is mandatory in all MSs and covers the whole population.

50 Countries can update their data retroactively; reported numbers are therefore subject to change in the

51 future or may vary from numbers reported in previous reports. The *M. bovis* and *M. caprae* EU

52 notification rate is calculated using the combined population of the EU MSs that reported data in 2023.

53 The proportion of tuberculosis cases caused by *M. bovis* or *M. caprae* was calculated using the

54 preliminary estimate of the total number of confirmed tuberculosis cases in 2023 among reporting EU

55 MSs' species-specific data. In 2023, no human data on *M. bovis* or *M. caprae* cases were available for

56 France because this MS did not report species-specific data within the *M. tuberculosis* complex (MTBC)

57 for human tuberculosis cases. France has not reported species-specific data in any previous years. In

58 addition, Latvia did not report any MTBC data for 2019, 2020, and 2023.

59 Because tuberculosis is a chronic disease with a long incubation period, it is not possible to assess

60 travel-associated cases in the same way as for diseases with acute onset. Instead, a distinction is made

61 between individuals with the disease originating from an EU MS (cases of EU origin) and those

62 originating from outside the EU (case originating outside of the EU). In the analysis, origin is mainly

63 based on the reported birthplace, except for cases from Austria, Belgium, Greece, Hungary and Poland,

64 whose origin is based on reported nationality.

65 **5.2.2. Animals**

66 **Bovine tuberculosis surveillance data**

67 Article 2 of Regulation (EU) 2016/429 (the new 'Animal Health Law' – AHL) states that its scope

68 applies to transmissible diseases, including zoonoses, without prejudice to the provisions laid down in

69 Directive 2003/99/EC (i.e. the Zoonoses Directive). Therefore, the annual zoonoses data reporting

70 requirements for MSs, as stipulated in Directive 2003/99/EC and implemented by EFSA through specific

71 tools, manuals and guidance, remain unaffected by the entry into force of Commission Implementing

72 Regulation (CIR) (EU) 2020/20021. This latter CIR outlines the compulsory notification and annual

<sup>1</sup> Commission Implementing Regulation (EU) 2020/2002 of 7 December 2020 laying down rules for the application of Regulation (EU) 2016/429 of the European Parliament and of the Council with regard to Union notification and Union reporting of listed diseases, to formats and procedures for submission and reporting of Union surveillance programmes and of eradication programmes and for application for recognition of disease-free status, and to the computerised information system, OJ L 412, 8.12.2020, p. 1–28

73 reporting obligations that MSs must fulfil with respect to ADIS2: EU MSs need to report to ADIS  
 74 outbreaks of infection with MTBC in bovine species (cattle, buffalo and bison), even-toed ungulates  
 75 (Artiodactyla) and other terrestrial mammals. Summaries of these reports are regularly made available  
 76 online.

77 In accordance with the Zoonoses Directive, MSs must report annual surveillance data for bovine  
 78 tuberculosis. These data are derived from compulsory national eradication and surveillance programmes  
 79 implemented in compliance with EU legislation, including the AHL. The reports submitted by MSs are  
 80 harmonised and enable the assessment of the epidemiological situation and trends analysis across MSs  
 81 and their zones.

82 Article 36 of Regulation (EU) 2016/429 provides for the European Commission's approval of the  
 83 disease-free status (DFS) of MSs or specific zones within them, with respect to MTBC infections. Due to  
 84 the differing levels of infection risk between DFS zones and zones under an eradication programme  
 85 (UEP), these zones have been treated separately in this chapter.

86 All cases of bovine tuberculosis caused by the MTBC members (*M. bovis*, *M. caprae* or *M.*  
 87 *tuberculosis*) were considered in summarising the EU situation on the disease in cattle. Whenever  
 88 possible, reporting MSs provided detailed distinctions between these MTBC species.

### 89 ***Mycobacterium* surveillance data from food and from animals other than bovine animals**

90 *Mycobacterium* spp. monitoring data from food and from animals other than bovine animals are  
 91 submitted to EFSA in accordance with Directive 2003/99/EC. Data collected allow for descriptive  
 92 summaries to be compiled at the EU level, but do not allow trend watching or trend analyses (**Error!**  
 93 **Reference source not found.**).

94 In accordance with CIR (EU) 2020/2002, notification to ADIS and surveillance rules apply to other  
 95 Artiodactyla than bovine animals (such as camelids, cervids, suidae, ovine and caprine animals) and  
 96 other terrestrial mammals susceptible to infection with MTBC.

## 97 **5.3. Results**

### 98 **5.3.1. Overview of key statistics, EU, 2019–2023**

99 **Error! Reference source not found.** summarises the EU-level statistics on human tuberculosis due  
 100 to *M. bovis* or *M. caprae* and on bovine tuberculosis during 2019–2023. More detailed descriptions of  
 101 these statistics are provided in the subsections below.

102 **Table 38:** Summary of tuberculosis due to *Mycobacterium bovis* and  
 103 *Mycobacterium caprae* statistics relating to humans and bovine animals  
 104 (stratified by disease status of MSs/ MS zones), EU, 2019–2023.

	2023 <sup>a</sup>	2022 <sup>a</sup>	2021 <sup>a</sup>	2020	2019 <sup>b</sup>	Data source
<b>Humans</b>						
Number of confirmed <i>M. bovis</i> cases	129	140	108	95	141	ECDC
Number of confirmed <i>M. caprae</i> cases	9	7	10	4	11	ECDC
Total number of confirmed cases	138	147	118	99	152	ECDC
Total number of confirmed cases/100,000 population (notification rates)	0.04	0.04	0.03	0.03	0.03	ECDC
Number of EU MSs that reported data on <i>M. bovis</i> or <i>M. caprae</i> cases	25	26	26	25	26	ECDC
<i>M. bovis</i> or <i>M. caprae</i> cases in individuals of EU origin	67	93	63	60	107	ECDC
<i>M. bovis</i> or <i>M. caprae</i> cases in individuals originating from outside EU	62	47	49	35	40	ECDC
<i>M. bovis</i> or <i>M. caprae</i> cases in individuals of unknown origin	9	7	6	4	5	ECDC

<sup>2</sup> EU Animal Diseases Information System (ADIS). More information is available at: [https://food.ec.europa.eu/animals/animal-diseases/animal-disease-information-system-adis\\_en](https://food.ec.europa.eu/animals/animal-diseases/animal-disease-information-system-adis_en)

Total number of foodborne outbreaks <sup>c</sup>	1	0	0	0	0	EFSA
Number of outbreak-related cases	3	0	0	0	0	EFSA
<b>Bovine animals</b>						
Number of infected herds in disease-free status zones <sup>d</sup>	162	149	139	139	143	EFSA
Number of reporting disease-free status MSs <sup>d</sup>	17	17	17	17	17	EFSA
Number of infected herds in zones under an eradication programme <sup>e</sup>	8,659	9,696	9,255	7,233	16,277	EFSA
Number of reporting MSs with zones under an eradication programme <sup>e</sup>	11	11	11	9 <sup>f</sup>	11	EFSA

Abbreviations: ECDC, European Centre for Disease Prevention and Control; EFSA, European Food Safety Authority; MSs, Member States.

<sup>a</sup>Data from the United Kingdom (Northern Ireland) were taken into account for 2021–2023. In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Windsor Framework (see Joint Declaration No 1/2023 of the Union and the United Kingdom in the Joint Committee established by the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community of 24 March 2023, OJ L 102, 17.4.2023, p.87) in conjunction with section 24 of Annex 2 to that Framework, for the purposes of this Regulation, references to Member States include the United Kingdom in respect of Northern Ireland.

<sup>b</sup>Data from the United Kingdom were taken into account for the 2018–2019 period, since the United Kingdom was still an EU MS at that time. However, on 1 February 2020 it became a third country.

<sup>c</sup>No information on the species was available for the *Mycobacterium* outbreak reported in 2023

<sup>d</sup>Member States, or zones thereof, with disease-free status regarding infection with the *Mycobacterium tuberculosis* complex (*M. bovis*, *M. caprae*, *M. tuberculosis* (MTBC) in their bovine animal population.

<sup>e</sup>The Member States or zones thereof with an approved eradication programme (UEP) for infection with MTBC. In addition, the United Kingdom (Northern Ireland) has an approved eradication programme for infection with MTBC.

<sup>f</sup>No data reported from Bulgaria.

### 5.3.2. Tuberculosis due to *Mycobacterium bovis* or *Mycobacterium caprae* in humans

In 2023, 138 confirmed human cases of tuberculosis due to *M. bovis* or *M. caprae* were reported from 13 MSs (Austria, Belgium, Denmark, Finland, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Romania, Spain and Sweden) (Table 39: ). Tuberculosis cases due to *M. bovis* (129 cases) were reported from all the above mentioned MSs except Hungary, which only reported cases caused by *M. caprae*. Austria, Germany and Spain also reported cases due to *M. caprae*, which accounted altogether for 9 cases in the EU.

In 2023, tuberculosis cases due to *M. bovis* or *M. caprae* accounted for a small proportion (0.35%) of total tuberculosis cases reported in the EU, Iceland, Norway, Liechtenstein and Switzerland. Overall, 25 MSs reported species-specific data on MTBC while twelve MSs did not report any cases. Reported cases of human tuberculosis due to *M. bovis* or *M. caprae* in the EU slightly decreased in 2023 compared to 2022 but remained high when compared to the 2020–2021 COVID-19 pandemic years.

The EU notification rate in 2023 was 0.036 cases per 100,000 population, which was a decrease of 6.1% compared with 2022, when the notification rate was 0.039 per 100,000 population. In 2023, the highest notification rate was reported by Ireland (0.15 per 100,000), followed by Spain (0.11 per 100,000).

Among the 17 MSs with disease-free status (DFS) in 2023, 15 MSs reported on MTBC species. *M. bovis* and *M. caprae* human cases were reported in eight MSs. The notification rate in these MSs reporting on MTBC species was 0.03 cases per 100,000 population. The notification rate for *M. bovis* and *M. caprae* human cases reported in the 10 non-DFS MSs in 2023 was 0.05 cases per 100,000 population.

The majority of the *M. bovis* and *M. caprae* human cases reported in 2023 (67/138; 48.6%) were of EU origin (native cases and/or cases originating from other MSs). The other cases originated from outside the EU (N = 62; 44.9%) or had unknown origin (N = 9; 6.5%) (Table 38: ). Notification rates of *M. bovis* and *M. caprae* human cases of EU origin were lower in disease-free MSs (N = 26; 38.8%) than in non-disease-free MSs (N = 41; 61.2%).

**Table 39:** Reported confirmed human cases of tuberculosis due to *Mycobacterium bovis* or *Mycobacterium caprae* and notification rates per 100,000 population in EU MS and non-MS countries, by country and year, 2019–2023.

Country	Status	2023		2022		2021		2020		2019			
		National coverage <sup>a</sup>	Data format <sup>a</sup>	Confirmed cases and rates									
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate		
Austria	DFS	Y	C	3	0.03	5	0.06	4	0.04	0	0	3	0.03
Belgium	DFS	Y	C	3	0.03	9	0.08	10	0.09	6	0.05	0	0
Bulgaria		Y	C	0	0	0	0	0	0	0	0	0	0
Croatia		Y	C	0	0	0	0	0	0	0	0	0	0
Cyprus		Y	C	0	0	0	0	0	0	0	0	0	0
Czechia	DFS	Y	C	0	0	0	0	0	0	0	0	0	0
Denmark	DFS	Y	C	1	0.02	0	0	0	0	0	0	0	0
Estonia	DFS	Y	C	0	0	0	0	0	0	0	0	0	0
Finland	DFS	Y	C	1	0.02	0	0	0	0	1	0.02	0	0
France <sup>b</sup>	DFS	–	–	–	–	–	–	–	–	–	–	–	–
Germany	DFS	Y	C	48	0.06	38	0.05	44	0.05	37	0.04	51	0.06
Greece		Y	C	1	0.01	1	0.01	0	0	2	0.02	1	0.01
Hungary	DFS	Y	C	1	0.01	0	0	0	0	0	0	0	0
Ireland		Y	C	8	0.15	7	0.14	2	0.04	4	0.08	7	0.14
Italy		Y	C	8	0.01	15	0.03	12	0.02	6	0.01	11	0.02
Latvia <sup>c</sup>	DFS	Y	C	–	–	0	0	0	0	–	–	–	–
Lithuania	DFS	Y	C	0	0	0	0	0	0	0	0	0	0
Luxembourg	DFS	Y	C	0	0	0	0	0	0	0	0	0	0
Malta		Y	C	0	0	0	0	0	0	0	0	0	0
Netherlands	DFS	Y	C	6	0.03	5	0.03	5	0.03	6	0.03	5	0.03
Poland	DFS	Y	C	0	0	1	< 0.01	0	0	0	0	0	0
Portugal		Y	C	0	0	0	0	0	0	0	0	0	0
Romania		Y	C	3	0.02	1	0.01	0	0	1	0.01	1	0.01
Slovakia	DFS	Y	C	0	0	0	0	0	0	0	0	0	0
Slovenia	DFS	Y	C	0	0	0	0	0	0	0	0	0	0
Spain		Y	C	54	0.11	59	0.12	37	0.08	30	0.06	35	0.07
Sweden	DFS	Y	C	1	0.01	6	0.06	4	0.04	6	0.06	3	0.03
<b>EU Total 27</b>				<b>138</b>	<b>0.04</b>	<b>147</b>	<b>0.04</b>	<b>118</b>	<b>0.03</b>	<b>99</b>	<b>0.03</b>	<b>117</b>	<b>0.03</b>
United Kingdom		–	–	–	–	–	–	–	–	–	–	35	0.05
<b>EU Total</b>				<b>138</b>	<b>0.04</b>	<b>147</b>	<b>0.04</b>	<b>118</b>	<b>0.03</b>	<b>99</b>	<b>0.03</b>	<b>152</b>	<b>0.03</b>
Iceland <sup>d</sup>		Y	C	0	0	0	0	0	0	0	0	0	0
Norway	DFS	Y	C	1	0.02	0	0	0	0	0	0	1	0.02
Liechtenstein	DFS	Y	C	0	0	0	0	0	0	3	0.03	4	0.05
Switzerland <sup>e</sup>	DFS	Y	C	10	0.11	1	0.01	4	0.05				

150 Abbreviations: –, Data not reported; DFS, Disease-free status, i.e. free of infection with *M. bovis*, *M. caprae* or *M. tuberculosis* in  
 151 the bovine animal population.

152 <sup>a</sup>Y: yes; N: no; A: aggregated data; C: case-based data.

153 <sup>b</sup>No surveillance system.

154 <sup>c</sup>Latvia did not report any MTBC data during 2019–2020 and 2023

155 <sup>d</sup>In Iceland, which has no special agreement concerning animal health (status) with the EU, the last outbreak of bovine tuberculosis  
 156 was in 1959.

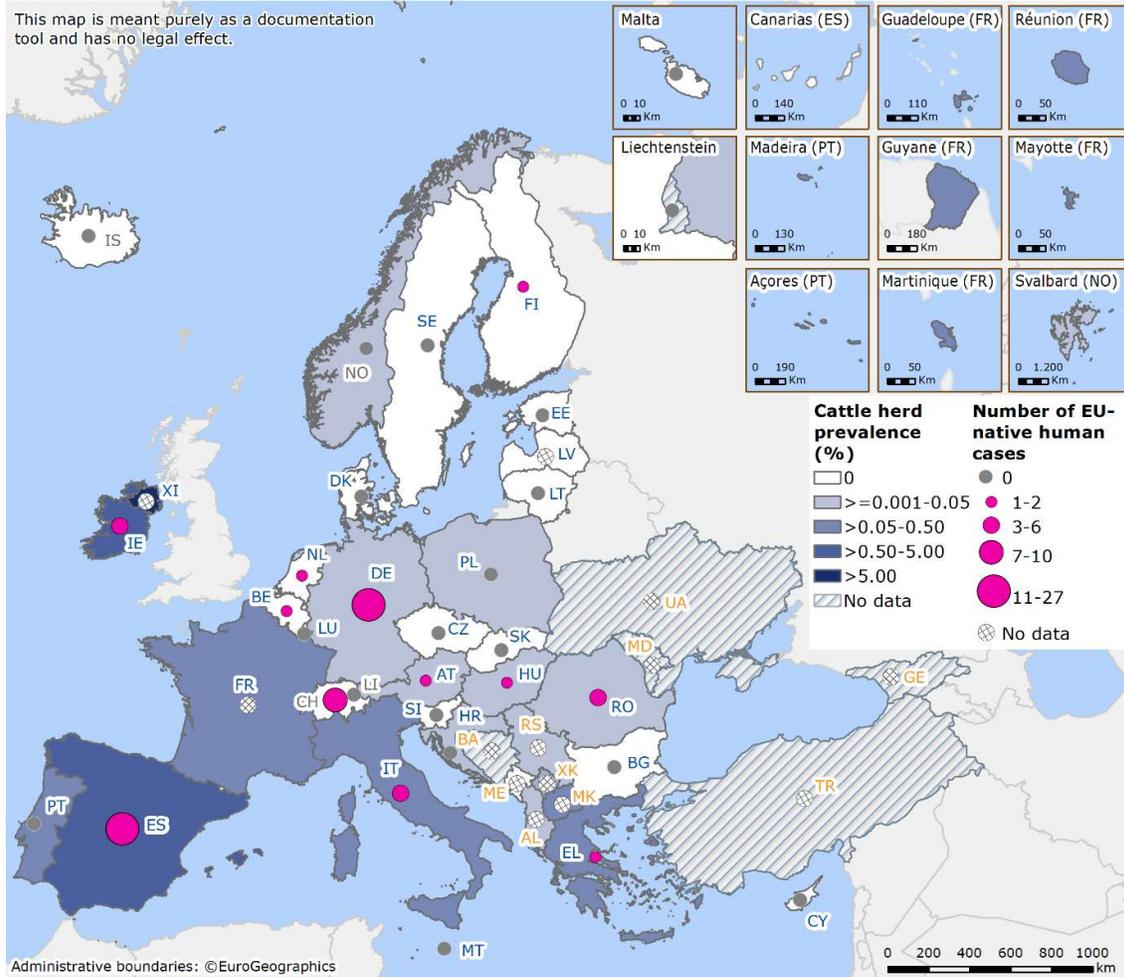
157 <sup>e</sup>Switzerland provided data directly to EFSA. The human data for Switzerland include data from Liechtenstein for the years 2019–  
 158 2020.

DFS	All zones of the MS have disease-free status.
	Not all zones of the MS have disease-free status.
	No zones of the MS have disease-free status.

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Figure 10 shows, for year 2023, the number of confirmed tuberculosis cases due to *M. bovis* or *M. caprae* in individuals of EU origin overlaid with the national aggregated herd prevalence of bovine tuberculosis.



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Member States that reported data at the national level without specifying the specific zones or overseas territories where the bovine tuberculosis-positive cattle herds were detected, were assigned the same color for all their zones, including overseas territories. For Albania, Kosovo and Serbia, prevalence data refer to animal tested.

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**Figure 10:** Map of the number of confirmed tuberculosis cases due to *Mycobacterium bovis* or *Mycobacterium caprae* in individuals of EU origin, and national herd prevalence of tuberculosis in the bovine animal population in EU MS and non-MS countries, 2023

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**5.3.3. *Mycobacterium* in food**

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No *Mycobacterium* species monitoring data from food were submitted for the year 2023.

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**5.3.4. Tuberculosis in bovine animals**

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**Bovine tuberculosis surveillance data**

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Seventeen MSs had DFS regarding MTBC during 2023 (**Error! Reference source not found.**). Of the remaining 10 MSs and the United Kingdom (Northern Ireland), three MSs had DFS zones or provinces:

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- Italy: 12 regions and 23 provinces;

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- Portugal: two regions (Algarve and Azores, except the island of São Miguel);

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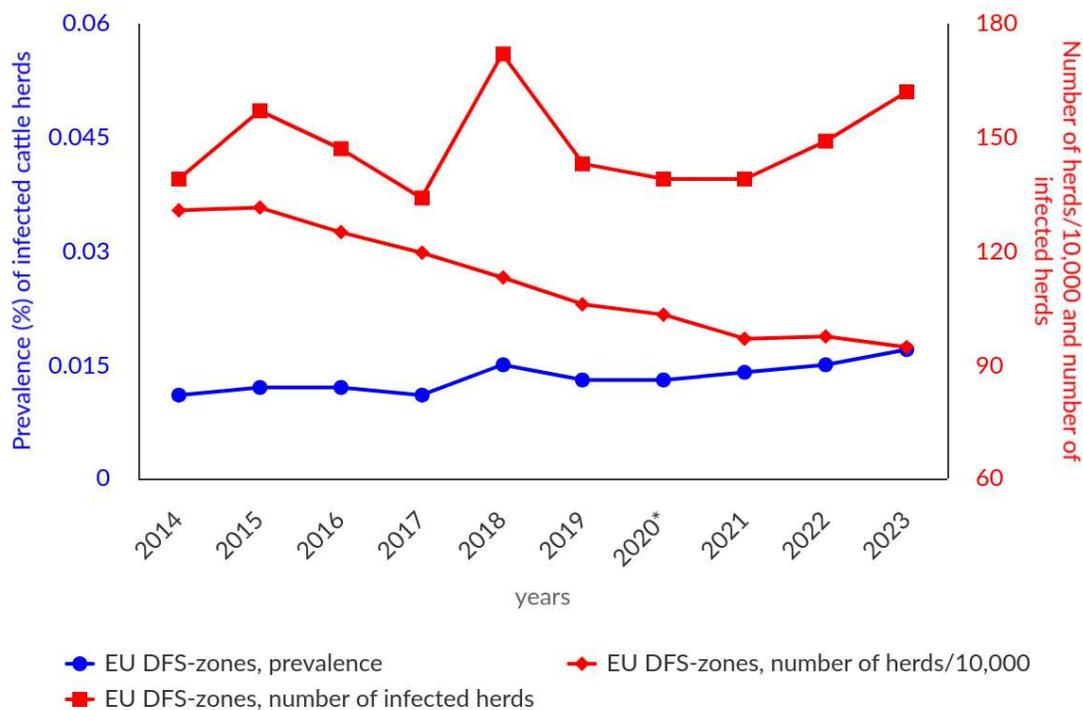
- Spain: seven autonomous communities and three provinces.

179 Seven MSs had no zones with DFS regarding MTBC. The United Kingdom (Northern Ireland) had no DFS  
 180 zones either.  
 181 Norway, Switzerland and Liechtenstein had DFS, in accordance with the EU legislation. In Iceland, which  
 182 has no special agreement with the EU on animal health status, the last outbreak of bovine tuberculosis  
 183 was reported in 1959. A map of EU MSs' disease status is available at link [here](#).  
 184 In 2023, the overall proportion of cattle herds in the EU infected with MTBC was very low, 0.57%, a  
 185 slight decrease from 0.61% in 2022. The total number of infected bovine herds in the EU also decreased,  
 186 from 9845 in 2022 to 8821 in 2023.  
 187 Fifteen MSs (12 DFS and three UEP countries) reported no cases of bovine tuberculosis. The remaining  
 188 12 MSs and the United Kingdom (Northern Ireland) reported cases of bovine tuberculosis, with  
 189 prevalence varying widely at the national level. MTBC infections were primarily concentrated in UEP  
 190 zones, where the overall prevalence of infected herds (1.5%) was 85 times higher than in DFS zones  
 191 (0.02%).  
 192 Five MSs reported MTBC infections in cattle without specifying the *Mycobacterium* species. *M. bovis* was  
 193 specifically detected in France, Germany, Ireland, Italy, Poland, Romania and the United Kingdom  
 194 (Northern Ireland), while *M. caprae* was specifically reported in Austria, Germany and Romania. No  
 195 cases of *M. tuberculosis* infection in cattle herds were reported.

### 196 MSs and MSs' zones with disease-free status regarding *Mycobacterium tuberculosis* 197 complex infection

198 The majority of the EU's cattle herd population (61.4%) is located in the DFS zones across 20 MSs.  
 199 However, the number of cattle herds in these zones has steadily declined, with a 27.6% decrease over  
 200 the last decade (2014–2023). Over this 10-year period there was a slight increase in both the number  
 201 of infected herds and the prevalence of MTBC-infected herds (Figure 11: ).

202 Seven MSs with DFS zones reported a total of 162 MTBC-infected bovine herds, confirming that the  
 203 detection of bovine tuberculosis in DFS zones is rare. When comparing 2023 to 2022, the number of  
 204 infected cattle herds increased by 13, while the prevalence remained unchanged at 0.02%. The total  
 205 number of cattle herds decreased by 2.9%.  
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208 (\*): In contrast to years 2014–2019, the year 2020 does not include the United Kingdom (Scotland) data. Since 1 February 2020,  
 209 the United Kingdom has withdrawn from the EU and has become a third country.

210 **Figure 11:** Prevalence of cattle herds infected with the *Mycobacterium tuberculosis* complex in  
211 disease-free status (DFS) zones, EU, 2014–2023

212 **MSs and MSs' zones with an approved eradication programme for infection with**  
213 ***Mycobacterium tuberculosis* complex**

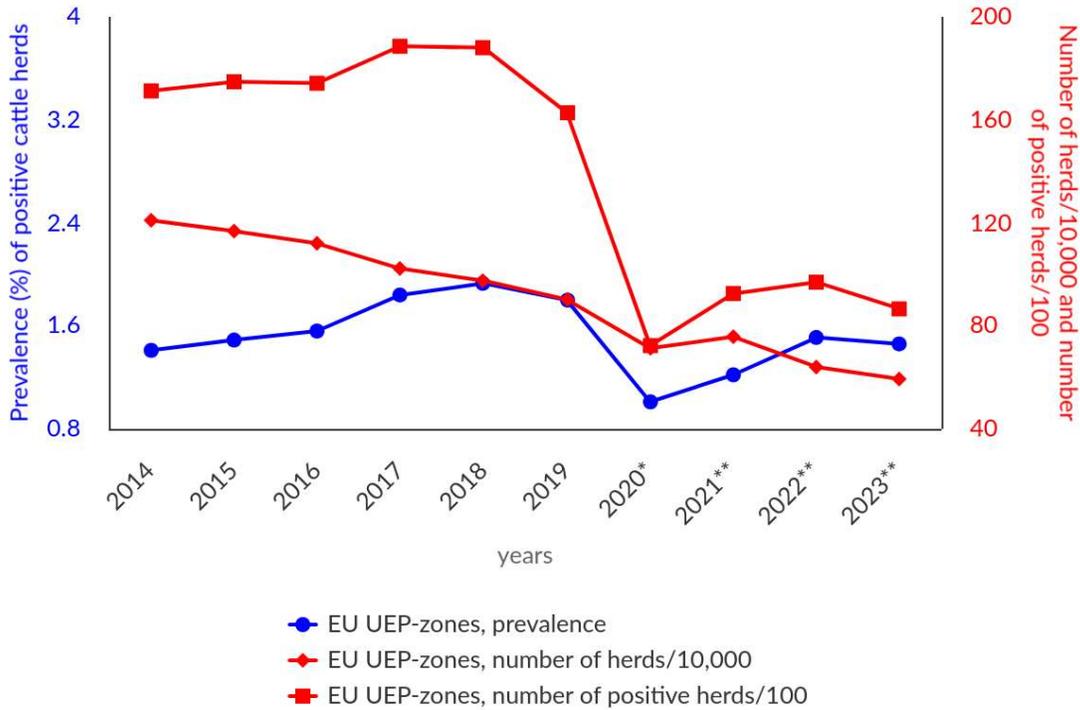
214 In 2023, cattle herds from UEP zones across 10 MSs and the United Kingdom (Northern Ireland)  
215 represented 38.6% of the total EU cattle herd population. This population has been steadily declining,  
216 with a 51.0% decrease compared to 2014 (Figure 12: ). Over the last decade (2014–2023), the  
217 prevalence of bovine tuberculosis in UEP zones has shown varying trends. From 2014 to 2019, data  
218 included the EU-28 MSs. However, the sharp decrease in 2020 can be attributed to the withdrawal of  
219 the United Kingdom from the EU and to the absence of data from Bulgaria in that year. Starting from  
220 2021, the increase in the number of reported cattle herds can be mainly explained by the resumption  
221 of data from Bulgaria after its 2020 hiatus and by the inclusion of data from the United Kingdom  
222 (Northern Ireland)<sup>3</sup>. Over the last decade (2014–2023), the total number of positive cattle herds in UEP  
223 zones decreased by 49.4%, whereas the prevalence increased by 3.1%.

224 Seven Member States and the United Kingdom (Northern Ireland) reported a total of 8659 herds positive  
225 for bovine tuberculosis in 2023, a 10.7% decrease from 9,696 herds in 2022. This reduction was  
226 primarily driven by the United Kingdom (Northern Ireland), which had reported 2,785 (12.2%) MTBC-  
227 positive herds in 2022. The United Kingdom (Northern Ireland) (7.2%), Ireland (4.8%) and Spain  
228 (3.2%) were the only countries with a prevalence higher than 1%. No positive herds were reported by  
229 Bulgaria, Cyprus or Malta. Compared with 2022, the overall prevalence in UEP zones remained stable  
230 at around 1.5%.

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<sup>3</sup> Data from the United Kingdom (Northern Ireland) were taken into account for 2021–2023. In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Windsor Framework (see Joint Declaration No 1/2023 of the Union and the United Kingdom in the Joint Committee established by the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community of 24 March 2023, OJ L 102, 17.4.2023, p.87) in conjunction with section 24 of Annex 2 to that Framework, for the purposes of this Regulation, references to Member States include the United Kingdom in respect of Northern Ireland



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\* In contrast to years 2014–2019, year 2020 does not include the United Kingdom data. Since 1 February 2020, the United Kingdom has withdrawn from the EU and has become a third country. No 2020 data were reported from Bulgaria.  
 \*\* Data from the United Kingdom (Northern Ireland) were taken into account for 2021–2023. In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Windsor Framework (see Joint Declaration No 1/2023 of the Union and the United Kingdom in the Joint Committee established by the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community of 24 March 2023, OJ L 102, 17.4.2023, p.87) in conjunction with Section 24 of Annex 2 to that Framework, for the purposes of this Regulation, references to MSs include the United Kingdom in respect of Northern Ireland.

243 **Figure 12:** Prevalence of cattle herds positive for bovine tuberculosis in zones under an eradication  
 244 programme (UEP), EU, 2014–2023

245 **Non-Member States and pre-accession countries**

246 Bovine tuberculosis was not detected in 2023 in Iceland, Liechtenstein or Switzerland, whereas Norway  
 247 reported one infected cattle herd and a herd prevalence of 0.01%. Among the pre-accession countries,  
 248 Montenegro, as in the previous 3 years, reported no infected herds; the Republic of North Macedonia  
 249 reported a herd prevalence of 0.08% (10/12,621), whereas Albania reported a prevalence of 0.01%  
 250 (7/94,252). Kosovo<sup>4</sup> reported a prevalence of 0.07% intradermal tuberculin skin test-positive bovines  
 251 (17/25,000)<sup>5</sup>.

252 **5.3.5. Mycobacterium tuberculosis complex surveillance data from animals other**  
 253 **than bovine animals**

254 In 2023, two MSs (Finland, Sweden), the United Kingdom (Northern Ireland) and one non-MS (Norway)  
 255 reported surveillance data on infection in farmed deer. In particular, Sweden reported data from a  
 256 control programme in farmed deer. One case of MTBC infection in farmed deer was reported by the  
 257 United Kingdom (Northern Ireland).

258 MSs also reported cases of MTBC infection in other mammal species. In particular, *M. bovis* was detected  
 259 in farmed alpacas (Ireland), goats (France, Ireland), pigs (France, Ireland, Italy, the United Kingdom

<sup>4</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

<sup>5</sup> The prevalence reported by Kosovo in 2022 was 3.1% (78/2,500).

260 (Northern Ireland)), cats (France, Switzerland, the United Kingdom (Northern Ireland)), wild deer (Italy,  
261 Ireland), wild boar (Spain, France, Italy) and badgers (France, Ireland, the United Kingdom (Northern  
262 Ireland)). *M. caprae* was detected in laboratory monkeys (France). Finally, *M. tuberculosis* was detected  
263 in an African elephant (zoo animal) in Switzerland.

264  
265 Refer to the dashboard mentioned at the beginning of the chapter for detailed insights.

## 266 5.4. Discussion

267 In 2023, the reporting of human tuberculosis due to *M. bovis* and *M. caprae* resulted in a total of  
268 138 cases, a decrease compared with year 2022. This corresponded in a relative notification decrease  
269 of 6.1% in 2023 (0.036 cases per 100,000) compared with 2022 (0.039 per 100,000 population). In  
270 particular, the decrease was due to *M. bovis* cases, by far the most frequent infection compared to *M.*  
271 *caprae* cases. Total cases of *M. caprae* appear to be relatively constant over the years. It is important  
272 to highlight that analysing the last 5 years trend, notification cases are still higher in 2022-2023 than in  
273 the previous 3 years, but this fact is mainly due to the increased number of cases in Spain. Taken all  
274 together, in the other countries a relatively stable epidemiological situation was observed during the  
275 long period, suggesting the normalization of the effect of the COVID-19 pandemic on human cases.

276 The specific analysis by countries showed that 12 MSs reported no cases. In addition, notification of  
277 total cases noticeably decreased in Austria, Belgium, Italy, Spain and Sweden. In contrast, some  
278 countries showed an increase of total cases, particularly Germany. As expected, the total number of  
279 cases were highest in Germany and Spain but when the data were referred to the human population,  
280 the highest notification rates were observed for Ireland and Spain, i.e. both countries with no disease  
281 free status for tuberculosis in bovine population demonstrating the importance of reaching a full disease-  
282 free status. The number of notifications clearly depends on efficient surveillance standards and rapid  
283 diagnostic intervention. Finally, France and Latvia did not report any MTBC data in 2023. When checking  
284 the native versus foreigner's ratio, for the first year the number approaches to 1, with native total  
285 notification numbers being constant over the recent years, whereas foreigner cases tend to increase,  
286 likely because of the resumption of the population movement after the COVID-19 pandemic restrictions.

287 Tuberculosis cases of zoonotic origin (due to *M. bovis* or *M. caprae*) and notification rates are highly  
288 likely to have been underestimated. Bias is introduced by those EU MSs that do not regularly perform  
289 routine tests to distinguish *M. bovis* and *M. caprae* from *M. tuberculosis*, resulting in under-notification  
290 at the EU level, because all cases in those MSs are reported as *M. tuberculosis*, and undermining the  
291 possibility of tracing the origin of infections (Fujiwara and Olea-Popelka, 2016). Furthermore, a lower  
292 notification rate was observed in EU MSs with DFS compared with non-DFS MSs, supporting the  
293 effectiveness of the surveillance programmes.

294 In conclusion, despite a general alarm that occupational exposure to zoonotic tuberculosis is an  
295 underestimated threat, in particular in developing countries (Devi, Lee, *et al*, 2021), EU 2023 human  
296 data show a positive short time term and, more generally, a constant condition, despite exceptions, in  
297 the long term, suggesting that the disease control and surveillance in EU MSs are constant and efficient.  
298 Looking into perspective, the steady decline of livestock population in EU over the recent years could  
299 help better control zoonotic tuberculosis in the future.

300 The regulatory framework for bovine tuberculosis changed substantially in the EU during 2021.  
301 Tuberculosis caused by MTBC infection is currently considered a disease to be controlled in all MSs with  
302 the goal of eradicating the disease in bovine animals throughout the EU, while being kept under  
303 surveillance in other mammals. All MSs are to have a surveillance, or a control and eradication,  
304 programme approved by the European Commission. This should lead, in the coming years, to  
305 progressive improvement in the already satisfactory epidemiological situation. In 2023, bovine  
306 tuberculosis was reported by 12 MSs and by the United Kingdom (Northern Ireland). Its distribution was  
307 highly heterogeneous and spatially clustered in the EU, with a national herd prevalence ranging from  
308 0% to 7.2%.

309 In 2023, seventeen MSs had DFS and in addition three UEP MSs had DFS zones. The number of DFS  
310 zones increased during 2023. Seven MSs with DFS zones detected bovine tuberculosis, which remained  
311 a rare event in these zones, as during the last decade (2014–2023). Seven of the 10 MSs with UEP  
312 zones, along with the United Kingdom (Northern Ireland), detected cases of bovine tuberculosis,  
313 resulting in an overall herd prevalence of 1.5%, similar to 2022. A 10.7% decrease in MTBC-positive  
314 herds was observed compared to 2022, primarily driven by a 42% reduction in MTBC-positive herds

315 reported by the United Kingdom (Northern Ireland). Over the last decade (2014–2023), the total number  
 316 of positive cattle herds in UEP zones decreased by 49.4%, whereas the prevalence increased by 3.1%.  
 317 These varying trends can be attributed for the most part to the decreased number of herds (-51.0%),  
 318 the gradual progression of DFS in MSs with UEP, and unfavourable environmental conditions hindering  
 319 the eradication process in several UEP zones.

320 In 2023, *M. bovis* was reported to be isolated from a wide range of domestic and wild mammal species  
 321 (other than bovine animals), which is a reflection of the broad host range that this pathogen has.  
 322 *M. caprae*, acknowledged to cause bovine tuberculosis, was reported only in cattle and in laboratory  
 323 macaques.

324 There is a major obstacle to eradication of bovine tuberculosis in areas where infection is endemic in  
 325 wildlife. Successfully tackling bovine tuberculosis also involves addressing the wildlife reservoir of the  
 326 disease. In 2018, Ireland introduced a vaccination policy in the Eurasian badger (*Meles meles*), a species  
 327 known to be a maintenance host of *M. bovis*. Among other control measures, Ireland is actively reducing  
 328 its badger population (Gormley et al., 2017). In contrast, no active badger intervention or vaccination  
 329 has been carried out in recent years in the United Kingdom (Northern Ireland), which may contribute  
 330 to the persistently higher prevalence levels there. Stagnating or increasing trends in the prevalence of  
 331 bovine tuberculosis demonstrate that eradication of this disease is a challenge, owing to the complex  
 332 interactions between the pathogen, hosts and local environmental factors (EFSA AHAW Panel, 2014).  
 333 MS-specific evaluations of status, trends and the relevance of bovine tuberculosis as a source of disease  
 334 for humans can be found in the 2023 Annual National Zoonoses Country Reports available online [here](#).

335

### 336 Related projects and internet sources

337

Subject	For more information see
<b>Food/ animals</b>	<a href="https://www.visavet.es/bovinetuberculosis/">https://www.visavet.es/bovinetuberculosis/</a>
Summary presentations on the situation as regards bovine tuberculosis control and eradication programmes in MS	<a href="https://food.ec.europa.eu/horizontal-topics/committees/paff-committees/animal-health-and-welfare_en#meetings_2022">https://food.ec.europa.eu/horizontal-topics/committees/paff-committees/animal-health-and-welfare_en#meetings_2022</a>
Animal Disease Information System (ADIS)	<a href="https://food.ec.europa.eu/animals/animal-diseases/animal-disease-information-system-adis_en">https://food.ec.europa.eu/animals/animal-diseases/animal-disease-information-system-adis_en</a>
Scientific Opinion of the EFSA Panel of Animal Health and Welfare (AHAW): Assessment of listing and categorisation of animal diseases within the framework of the Animal Health Law (Regulation (EU) No 2016/429): bovine tuberculosis	<a href="https://www.efsa.europa.eu/en/efsajournal/pub/4959">https://www.efsa.europa.eu/en/efsajournal/pub/4959</a>
World Organisation for Animal Health. General Disease Information Sheet on Bovine Tuberculosis	<a href="http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Disease_cards/BOVINE-TB-EN.pdf">http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Disease_cards/BOVINE-TB-EN.pdf</a>
SITVITBovis (a WorldWide database of genotyping markers for <i>M. bovis</i> provided by the	<a href="http://www.pasteur-guadeloupe.fr:8081/SITVIT_Bovis/">http://www.pasteur-guadeloupe.fr:8081/SITVIT_Bovis/</a>

Institut Pasteur in Guadeloupe)	
EFSA. Biological hazards report (national zoonosis country reports)	<a href="https://www.efsa.europa.eu/en/data-report/biological-hazards-reports">https://www.efsa.europa.eu/en/data-report/biological-hazards-reports</a>

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## Acronyms

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ADIS: Animal Disease Information System

AHL: Animal Health Law

CIR: Commission Implementing Regulation

DFS: Disease-free status

MS: Member State

MTBC: *Mycobacterium tuberculosis* complex

UEP: Under an eradication programme