

# Tuberculosis

## Annual Epidemiological Report for 2019

### Key facts

- In 2019, 29 countries in the European Union/European Economic Area (EU/EEA) reported a total of 49 752 tuberculosis (TB) cases (9.6 per 100 000 population).
- The overall TB notification rate in the EU/EEA continued to decline, as did most country-specific TB notification rates. However, the EU/EEA is not on track to reach the goal of ending the TB epidemic by 2030.
- Multidrug resistance (MDR) was reported for 3.4% of TB cases with drug susceptibility testing results reported. Extensive drug resistance (XDR) was reported for 22.4% of MDR TB cases that underwent second-line drug susceptibility testing.
- Nineteen countries reported HIV status for 78.0% of their TB cases. Of these TB cases with known HIV status, 3.1% were HIV positive.
- Treatment success was achieved in 63.7% of TB cases notified in 2018, 54.9% of HIV-co-infected TB cases notified in 2018, 46.8% of MDR TB cases notified in 2017 and 34.9% of XDR TB cases notified in 2016.

### Methods

This report is based on data for 2019 retrieved from The European Surveillance System (TESSy) on 26 January 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, please refer to the 'Introduction to the Annual epidemiological report' [1].

An overview of the national surveillance systems for TB 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].

This report only includes data from EU/EEA countries. In 2019, all reporting countries had comprehensive surveillance systems and used the EU case definition for TB [4]. Under this case definition, confirmed cases required either a positive culture or detection of both acid-fast bacilli by microscopy and *Mycobacterium tuberculosis* complex by nucleic acid amplification testing.

---

Suggested citation: European Centre for Disease Prevention and Control. Tuberculosis. In: ECDC. Annual epidemiological report for 2019. Stockholm: ECDC; 2021.

Stockholm, September 2021

© European Centre for Disease Prevention and Control, 2021. Reproduction is authorised, provided the source is acknowledged.

## Epidemiology

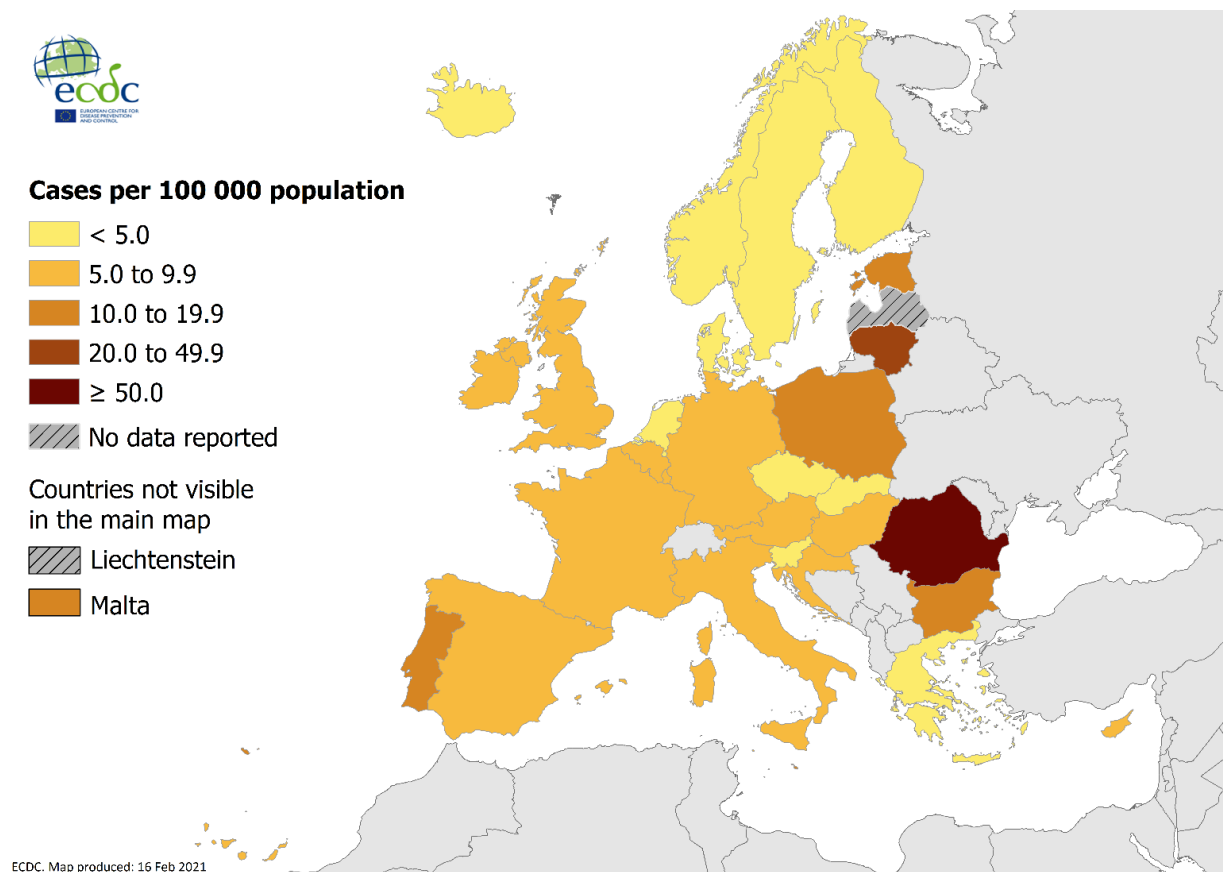
In 2019, 29 of 31 EU/EEA countries reported a total of 49 752 TB cases. Ten countries reported 87.8% of the total cases, with Romania alone accounting for 23.4% of all TB cases reported in 2019 (Table 1). The rate of notifications per 100 000 population was 9.6, continuing the downward trend observed since the launch of European enhanced TB surveillance in 1996. As observed in previous years, country-specific rates varied considerably in 2019, ranging from 3.1 in Norway to 59.9 in Romania (Table 1 and Figure 1). Notification rates in the majority of countries have continued to decline or have remained largely stable since 2015. Age-standardised notification rates did not differ substantially from crude rates.

**Table 1. Distribution of TB cases and rates per 100 000 population by country and year, EU/EEA, 2015–2019**

Country	2015		2016		2017		2018		2019		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	ASR
Austria	583	6.8	634	7.3	569	6.5	482	5.5	474	5.4	5.3
Belgium	977	8.7	1 042	9.2	967	8.5	977	8.6	968	8.5	8.7
Bulgaria	1 660	23.0	1 603	22.4	1 463	20.6	1 358	19.3	1 344	19.2	18.4
Croatia	488	11.5	464	11.1	378	9.1	372	9.1	303	7.4	6.9
Cyprus	63	7.4	60	7.1	53	6.2	52	6.0	69	7.9	7.7
Czechia	517	4.9	516	4.9	501	4.7	443	4.2	464	4.4	4.2
Denmark	357	6.3	330	5.8	275	4.8	291	5.0	281	4.8	5.1
Estonia	217	16.5	192	14.6	175	13.3	147	11.1	150	11.3	10.8
Finland	272	5.0	234	4.3	245	4.5	225	4.1	225	4.1	3.9
France	4 744	7.1	5 735	8.6	5 015	7.5	5 092	7.6	5 116	7.6	8.1
Germany	5 837	7.2	5 925	7.2	5 498	6.7	5 492	6.6	4 791	5.8	6.0
Greece	482	4.4	440	4.1	467	4.3	432	4.0	459	4.3	4.4
Hungary	906	9.2	786	8.0	685	7.0	640	6.5	552	5.6	5.4
Iceland	7	2.1	6	1.8	14	4.1	8	2.3	13	3.6	3.7
Ireland	283	6.1	315	6.7	300	6.3	310	6.4	266	5.4	5.7
Italy	3 769	6.2	4 032	6.6	3 944	6.5	3 912	6.5	3 346	5.5	5.7
Latvia	721	36.3	660	33.5	552	28.3	NR	NR	NR	NR	NR
Liechtenstein	2	5.4	2	5.3	1	2.6	1	2.6	NR	NR	NR
Lithuania	1 507	51.6	1 442	49.9	1 387	48.7	1 142	40.7	1 058	37.9	36.6
Luxembourg	30	5.3	29	5.0	32	5.4	42	7.0	50	8.1	8.1
Malta	32	7.3	50	11.1	42	9.1	55	11.6	98	19.9	20.7
Netherlands	862	5.1	887	5.2	783	4.6	797	4.6	759	4.4	4.6
Norway	313	6.1	295	5.7	261	5.0	208	3.9	165	3.1	3.2
Poland	6 430	16.9	6 444	17.0	5 787	15.2	5 487	14.4	5 321	14.0	13.5
Portugal	2 195	21.2	1 936	18.7	1 914	18.6	1 905	18.5	1 771	17.2	16.8
Romania	15 183	76.4	13 601	68.8	12 997	66.2	12 199	62.5	11 633	59.9	59.1
Slovakia	317	5.8	296	5.5	249	4.6	281	5.2	214	3.9	3.9
Slovenia	130	6.3	118	5.7	112	5.4	99	4.8	101	4.9	4.5
Spain	5 020	10.8	5 070	10.9	5 660	12.2	4 766	10.2	4 150	8.8	8.8
Sweden	815	8.4	714	7.2	519	5.2	489	4.8	479	4.7	4.9
United Kingdom	6 228	9.6	6 116	9.4	5 531	8.4	5 036	7.6	5 132	7.7	8.0
<b>EU/EEA</b>	<b>60 947</b>	<b>11.9</b>	<b>59 974</b>	<b>11.6</b>	<b>56 376</b>	<b>10.9</b>	<b>52 740</b>	<b>10.2</b>	<b>49 752</b>	<b>9.6</b>	<b>9.7</b>

ASR: age-standardised rate; NR: no data reported.

Confirmed cases are based on the EU case definition: culture positive or both microscopy positive and nucleic acid amplification test positive.

**Figure 1. Distribution of tuberculosis cases per 100 000 population by country, EU/EEA, 2019**

## Previous treatment, laboratory confirmation and TB site

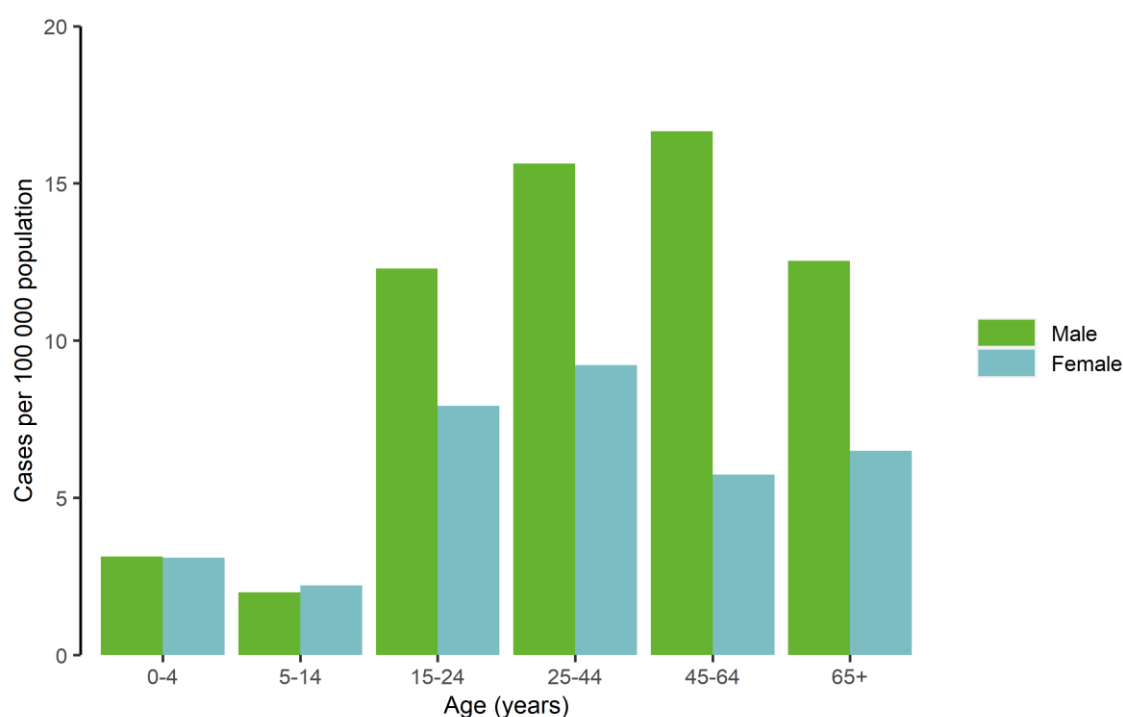
The distribution of cases by previous treatment history was similar in 2019 to that reported in previous years: 38 267 (76.9%) of 49 752 TB cases reported in 2019 were newly diagnosed, 4 843 (9.7%) had been previously treated for TB and 6 642 (13.4%) had an unknown previous treatment status. The proportion of previously treated cases was above 10% in seven countries: Bulgaria (11.2%), Estonia (16.0%), Hungary (10.1%), Lithuania (17.3%), Poland (11.4%), Romania (19.7%), and Slovakia (15.9%).

Among TB cases reported in 2019, 33 368 (67.1%) were laboratory confirmed. Of these cases, 26 570 (79.6%) had laboratory confirmation based only on culture-positive results, 339 (1.0%) were both smear and nucleic acid test positive (but culture negative), and 6 459 (19.4%) cases were culture, smear and nucleic acid test positive.

Of all 49 752 TB cases reported in 2019, 34 975 (70.3%) were diagnosed with pulmonary TB, 10 988 (22.1%) with extrapulmonary TB, 3 514 (7.1%) with a combination of both and 275 (0.6%) had no TB site reported.

## Age and sex

In 2019, the highest notification rate was observed in the 25 to 44 years age group (11.9 per 100 000 population). Overall, the notification rate in males was twice the rate in females, but this imbalance was limited to the age groups above 14 years (Figure 2).

**Figure 2. Distribution of tuberculosis cases per 100 000 population, by age and gender, EU/EEA, 2019**

## Origin of cases

Of the 49 752 TB cases notified in 2019, 31 239 (62.8%) were born in, or were citizens of, the reporting country (referred to as 'native'), 17 181 (34.5%) were of foreign origin, and 1 332 (2.7%) were of unknown origin. Of the seven countries with TB notification rates higher than 10 per 100 000 population, four reported fewer than 5% of TB cases as being of foreign origin: Bulgaria (0.0%), Lithuania (1.5%), Poland (2.3%), and Romania (0.4%). The remaining three countries reported a higher proportion of TB cases of foreign origin: Estonia (24.0%), Malta (95.9%), and Portugal (23.7%).

## Drug resistance

Of the 31 007 laboratory-confirmed TB cases notified in 2019, 24 812 (80.0%) had isoniazid and rifampicin susceptibility testing results reported. Of these cases with testing results reported, resistance to at least one anti-TB drug was reported for 2 638 (10.6%) and multidrug resistance was reported for 834 (3.4%). The proportion of TB cases with resistance to at least one anti-TB drug was similar in 2019 compared with 2018 and 2017: 10.6%, 11.5% and 10.9%, respectively. Over these three years, the proportion of TB cases with resistance to multiple anti-TB drugs also remained similar (2019: 3.4%, 2018: 3.7%, 2017: 3.8%).

XDR TB was reported for 126 (22.4%) of 563 MDR TB cases that reported second-line drug susceptibility testing results. This proportion increased in 2019 (from 19.6% in 2018), but the numbers remain low overall.

## HIV co-infection

Nineteen countries reported HIV status for 16 088 (78.0%) of 20 620 TB cases in 2019. Of cases with known HIV status, 502 (3.1%) were reported as HIV positive. Among the 16 countries with at least 50% reporting completeness for HIV status, co-infected cases were highest in Belgium (8.7%), Estonia (11.3%), Hungary (9.4%), Ireland (9.4%), and Portugal (11.0%). Compared with 2018, there was a decrease in the number of countries that reported the HIV status of TB cases, and only 32.3% of all TB cases notified in 2019 had known HIV status.

## Treatment outcome

Of the 42 811 TB cases notified in 2018 with a treatment outcome reported in 2019, 27 277 (63.7%) were treated successfully, 2 853 (6.7%) died, 358 (0.8%) experienced treatment failure, 1 623 (3.8%) were lost to follow-up, 1 705 (4.0%) were still on treatment in 2019, and 8 995 (21.0%) had not been evaluated.

Treatment success was achieved in 275 (54.9%) of 501 HIV co-infected cases who were reported as being on first-line TB treatment in 2018. Among all 952 MDR TB cases notified in 2017, 446 (46.8%) were reported to have had treatment success, compared with only 60 (34.9%) of 172 XDR TB cases notified in 2016.

## Discussion

In 2019, 29 of 31 EU/EEA countries reported TB notification data and a total of 49 752 TB cases. As in previous years, a few countries reported a large proportion of the total number of TB cases, including Romania, which reported almost a quarter of all cases in 2019.

The overall TB notification rate declined to 9.6 per 100 000 population, continuing the decreasing trend observed since 2002. The United Nations Sustainable Development Goal 3 at the EU/EEA level is to reach a notification rate of 2.4 per 100 000 in 2030 (an 80% reduction of the 2015 TB notification rate of 11.9 per 100 000). Although progress is being made towards this goal, the current rates of decline in the majority of EU/EEA countries are not on track to reach this target by 2030, or the elimination target by 2050 [5]. Countries need to accelerate their progress if these goals are to be met.

Reassuringly, the number of MDR TB and XDR TB cases in the EU/EEA continued to decrease in 2019, despite the high number of drug-resistant TB cases in the European Region High Priority Countries (HPCs) bordering the EU/EEA. Drug susceptibility testing results for first-line drugs were only reported for approximately 75% of laboratory-confirmed TB cases, indicating that there is still considerable room for improvement. Countries need to obtain and report drug susceptibility testing results in order to diagnose and treat drug-resistant TB, as well as to monitor this threat.

The World Health Organization (WHO) has set a target of 85% for TB treatment success [6]. Data reported in 2019 (63.7% treatment success rate) indicate that improvement is needed to reach this target. The target for successful treatment of MDR TB cases after 24 months is 75%. Data for 2019 indicate that, overall, the EU/EEA is far below this (46.8% of MDR TB cases had treatment success). In 2020, WHO released updated treatment guidelines for drug-resistant TB [7]. The move away from injectable agents to all-oral regimens, and new agents such as pretomanid, provide hope that the rate of treatment success for MDR TB will improve in the future.

The TB situation reflected in this report indicates that countries continue to face several challenges in reaching the goals set by the United Nations and WHO. These challenges may be intensified by the broader impact of the COVID-19 pandemic – which will be reflected in the 2020 TB surveillance data – such as disruptions to or reallocation of TB laboratory [8] and clinical services, as well as major pressures on public health workforce capacity and limitations on patient access to TB services [9].

## Public health implications

As TB is a poverty-related disease, some of the reasons for the differences between high- and low-incidence countries are socio-economical. These issues will eventually need to be addressed, as public health measures alone are insufficient to end the TB epidemic. In the meantime, all countries are encouraged to ensure rapid diagnosis of TB and drug-resistant TB, and to provide adequate treatment as the most effective intervention to stop TB transmission. High-incidence countries should consider assessing whether and where their TB programmes need further strengthening. Low-incidence countries should consider focusing their screening, diagnostic and treatment efforts even more on subpopulations vulnerable to TB.

# References

1. European Centre for Disease Prevention and Control. Introduction to the Annual epidemiological report. In: ECDC. Stockholm: ECDC; 2017. Available from: <https://www.ecdc.europa.eu/en/all-topics-z/surveillance-and-disease-data/annual-epidemiological-reports/introduction-annual>
2. European Centre for Disease Prevention and Control. Surveillance systems overview for 2019. Stockholm: ECDC; 2021. Available from: <https://www.ecdc.europa.eu/en/publications-data/surveillance-systems-overview-2019>
3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases. Stockholm: ECDC; 2019 [cited 11 Feb 2021]. Available from: <http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=54>
4. European Commission. COMMISSION IMPLEMENTING DECISION (EU) 2018/945 of 22 June 2018 on the communicable diseases and related special health issues to be covered by epidemiological surveillance as well as relevant case definitions. Official Journal of the European Union. Luxembourg: Publications Office of the European Union. 06.07.2018:L 170/47. Available from: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018D0945&from=EN#page=47>
5. World Health Organization. Towards TB elimination: an action framework for low incidence countries. Geneva: WHO; 2014. Available from: [http://apps.who.int/iris/bitstream/handle/10665/132231/9789241507707\\_eng.pdf?sequence=1](http://apps.who.int/iris/bitstream/handle/10665/132231/9789241507707_eng.pdf?sequence=1)
6. WHO Regional Office for Europe. Roadmap to implement the tuberculosis action plan for the WHO European Region 2016–2020. Towards ending tuberculosis and multidrug-resistant tuberculosis. Copenhagen: WHO/Europe; 2016. Available from: <http://www.euro.who.int/en/publications/abstracts/roadmap-to-implement-the-tuberculosis-action-plan-for-the-who-european-region-20162020.-towards-ending-tuberculosis-and-multidrug-resistant-tuberculosis-2016>
7. World Health Organization. WHO consolidated guidelines on tuberculosis. Module 4: Treatment. Drug-resistant treatment. Geneva: WHO; 2020. Available from: <https://www.who.int/publications-detail-redirect/9789240007048>
8. Nikolayevskyy V, Holicka Y, van Soolingen D, van der Werf MJ, Ködmön C, Surkova E, et al. Impact of COVID-19 pandemic on tuberculosis laboratory services in Europe. Eur Respir J. 2021;57(1):2003890. Available from: <https://pubmed.ncbi.nlm.nih.gov/33184119/>
9. World Health Organization. Global tuberculosis report 2020. Geneva: WHO; 2020. Available from: <https://apps.who.int/iris/bitstream/handle/10665/336069/9789240013131-eng.pdf>