Basic Overview of Tuberculosis Epidemiology in the Czech Republic in 2022

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Contents

1. Introduction

The publication “Basic Overview of Tuberculosis Epidemiology in the Czech Republic” has been regularly published by the Institute of Health Information and Statistics of the Czech Republic (IHIS) since 2016 (containing data for 2015) and picks up the threads of the publication “Tuberculosis and Respiratory Diseases”, which included data from 1960 to 2014. It is a selection of the most important review tables describing the occurrence of reported cases of tuberculosis (TB) and other mycobacterial infections in the Czech Republic. The presented data were obtained from the Register of Tuberculosis (RTB), which is part of an information system maintained by public health protection authorities, and which is run as a web application based on a central database. Furthermore, the Information System of Bacillary Tuberculosis (ISBT) has become an inseparable part of RTB. In the Czech Republic, all detected cases of tuberculosis or other mycobacterial infections must be reported into RTB. Apart from RTB data, data from the Czech Statistical Office are used to calculate rates per population.

RTB is administered by the Ministry of Health of the Czech Republic (MZ CR). Data on the national level are processed by IHIS, which is also responsible for providing and publishing statistical outputs and, together with the National Tuberculosis Surveillance Unit, maintains contacts with international organisations.

The binding regulations in this domain involve: Act No. 258/2000 Coll. on Protection of Public Health and Amendment to Some Related Acts; Decree No. 306/2012 Coll. of MZ CR on Conditions of Prevention and Spread of Infectious Diseases and Hygiene Requirements for the Operation of Medical Facilities and Social Care Institutions; Decree No. 473/2008 Coll. of MZ CR on System of Epidemiological Vigilance for Selected Infections, as subsequently amended; and Standard of Follow-Up Care for Patients with Tuberculosis and Other Mycobacterial Infections and for Persons at a Higher Risk of These Diseases (Bulletin No. 7/2016 of MZ CR).

In the context of evaluation of TB epidemiology in the Czech Republic, a new online and publicly available data-mining tool has been developed during the year 2020, providing a better insight into this issue; the tool will be designed in an interactive way, offering many different (and adjustable) points of view (available at: https://tbc.uzis.cz/).

2. Methodology

The tabular outputs summarise TB epidemiology in the Czech Republic in 2022, based on data from RTB valid as of 26 July 2023. The reported cases of disease are assessed from many points of view, such as laboratory verification of the disease, age groups and sex, previous treatment, disease location, sensitivity to antitubercular agents, patient's death or country of birth. Information on the evaluation of antituberculosis therapy at 12 months after its start is linked to cases reported into RTB in 2021. The last two tables, unlike all the preceding ones, provide information on reported cases of mycobacterial infections other than TB.

Data are available both as absolute numbers and as standardised indicators.

3. Summary of results

In 2022, a total of 383 TB cases (i.e. 3.56 cases per 100,000 population), involving all forms and locations, were reported into RTB (Table 1). Compared with the previous year, the number of reported cases has increased (in 2022, there are 26 more than in 2021). There has been a continuous downward trend in TB incidence in the Czech Republic in the long term, and the burden has been low when compared to other countries. Among the reported patients, there were 30 persons who had been previously treated with antituberculotics (Table 3).

From the total number of reported TB cases in 2022, definitive diagnosis of TB was confirmed in 310 cases – 80.9% were culture positive, of which 257 cases were verified from sputum or from the laryngeal swab (LS). Sputum smear microscopy was positive in 166 patients (43.3%) (Table 1).

According to RTB data, pulmonary TB was reported in 338 cases (88.3%); these cases also involved patients who had both pulmonary and extrapulmonary TB. By contrast, extrapulmonary TB only was reported in 45 cases (Table 4).

TB occurred much more frequently in men than in women: men accounted for more than 70% of cases. TB was most frequently reported in people aged 40–44 years; when recalculated per 100,000 population, men between 50-54 years and women between 40-44 were most frequently affected. In 2022 there was same amount of cases among patients younger than 20 years (19 in 2021) and number of cases among patients between 20-29 decreased to 19 (42 in 2021) (Table 2).

Just as in previous years, the Capital of Prague was the residence of most TB patients (97; 7.25 per 100,000 population) reported in 2022. Higher numbers of TB cases than the national mean of 3.56 per 100,000 population were also reported in the Usti nad Labem Region (4.81 per 100,000), Hradec Kralove Region (4.34 per 100,000), Karlovy Vary Region (4.12 per 100,000) and South Moravian Region (3.89/100,000). By contrast, the lowest absolute and relative numbers of TB cases were reported in the Liberec Region (7; 1,57 per 100,000).

TB cases of 166 persons born outside the Czech Republic were reported into RTB in 2022, accounting for 43% of the total number of reported TB cases. Most of these people originated from Ukraine (88 persons), Vietnam (17 persons), India (9 persons), Slovakia (7 persons), Philippines (6 persons), Poland (6 persons) and Romania (6 persons) (Table 6). War refugees accounted for a significant year-on-year increase in the number of persons born in Ukraine with TB (an increase from 35 to 88, i.e. by 151%) in 44 cases.

In 2022, sensitivity to antituberculotics was tested in 298 patients. Isoniazid, streptomycin, pyrazinamide, rifampicin and ethambutol resistance were detected in 29 (9.7%), 29 (9.7%), 15 (5.0%), 17 (5.7%) and 11 (3.7%) cases, respectively. Multidrug-resistant TB was detected in 17 cases (5.7%). More information on resistance to antitubercular drugs is available in Table 5.

From the total number of not yet treated TB cases in 2021 that were verified from sputum or from the laryngeal swab (212 cases), evaluation of antituberculosis therapy at 12 months after its start (Treatment outcome monitoring) has shown that 141 persons (66.5%) were successfully treated and 27 persons (12,7%) died, out of which 19 died from TB (9,0%). After one year, treatment continued in 13 persons (6,1%). 8 persons (3.8%) moved elsewhere; treatment was interrupted or data on treatment were missing in 23 persons (10.8%) and none of the treatments failed (Table 7).

In 2022, a total of 25 TB deaths were reported into RTB (this number may include additionally reported deaths from previous periods); the highest numbers of deaths were reported in the Capital of Prague, Central Bohemian Region and South Moravian Region (5 persons in each region) (Table 8).

Apart from tuberculosis, cases of other mycobacterial infections are reported into RTB, too. In 2022, there were 114 reported cases of other mycobacterial infections (in 2021, there were 77 cases), i.e. 1.06 cases per 100,000 population. Within these cases, there were 87 cases with pulmonary location and 27 cases with extrapulmonary location. M. avium (46 cases), M. xenopi (19 cases), M. intracellulare (13 cases) a M. kansasii (11 cases) were the most frequently isolated strains (Table 9). Mycobacterial infections are most frequently reported in Prague (20 cases), the Moravian-Silesian Region (16 cases), South Moravian Region (13 cases) and Usti and Labem Region (13 cases). When recalculated per 100,000 population, there were most cases in the

Hradec Kralove Region (1.81 per 100,000 population) and in the Usti and Labem Region (1.60 per 100,000 population) (Table 10).

Table 1. Reported numbers of TB cases in regions of the Czech Republic

Territory, region [1)]	Reported TB cases in total		Culture positive TB cases		Culture positive TB cases, verification from sputum or LS		Sputum smear microscopy positive TB cases	
	absolute numbers	per 100,000 population	absolute numbers	per 100,000 population	absolute numbers	per 100,000 population	absolute numbers	per 100,000 population
Czech Republic	383	3.56	310	2.88	257	2.39	166	1.54
Capital of Prague	97	7.25	83	6.20	65	4.86	38	2.84
Central Bohemian	42	2.94	33	2.31	29	2.03	21	1.47
South Bohemian	15	2.31	11	1.69	10	1.54	8	1.23
Plzeň	21	3.51	14	2.34	12	2.01	7	1.17
Karlovy Vary	12	4.12	6	2.06	6	2.06	6	2.06
Ústí nad Labem	39	4.81	34	4.20	31	3.83	20	2.47
Liberec	7	1.57	4	0.90	4	0.90	5	1.12
Hradec Králové	24	4.34	19	3.44	14	2.53	9	1.63
Pardubice	12	2.28	10	1.90	8	1.52	3	0.57
Vysočina	10	1.95	10	1.95	9	1.76	4	0.78
South Moravian	47	3.89	39	3.22	31	2.56	19	1.57
Olomouc	14	2.22	10	1.59	8	1.27	3	0.48
Zlín	11	1.90	11	1.90	8	1.38	6	1.04
Moravian-Silesian	32	2.69	26	2.19	22	1.85	17	1.43

[1)] Regions of patients' residence are reported

Tab. 2. Hlášené počty TBC podle věkových skupin a pohlaví

Věková skupina (roky)	Hlášená onemocnění TBC					
	absolutně			*na 100 000 obyvatel*		
	celkem	muži	ženy	*celkem*	*muži*	*ženy*
0–4 roky	4	3	1	*0.71*	*1.04*	*0.36*
5–9 let	2	1	1	*0.35*	*0.34*	*0.36*
10–14 let	5	2	3	*0.83*	*0.65*	*1.02*
15–19 let	8	5	3	*1.49*	*1.82*	*1.15*
20–24 let	9	6	3	*1.81*	*2.37*	*1.23*
25–29 let	10	4	6	*1.73*	*1.35*	*2.13*
30–34 let	39	27	12	*5.54*	*7.47*	*3.51*
35–39 let	39	31	8	*5.32*	*8.24*	*2.24*
40–44 let	44	29	15	*5.28*	*6.78*	*3.69*
45–49 let	41	32	9	*4.43*	*6.77*	*1.99*
50–54 let	41	36	5	*5.65*	*9.79*	*1.40*
55–59 let	26	20	6	*3.79*	*5.82*	*1.75*
60–64 let	35	24	11	*5.80*	*8.15*	*3.56*
65–69 let	22	16	6	*3.33*	*5.20*	*1.70*
70–74 let	29	19	10	*4.70*	*7.01*	*2.90*
75-79 let	15	8	7	*3.26*	*4.27*	*2.57*
80-84 let	11	8	3	*4.23*	*8.32*	*1.83*
85-89 let	2	-	2	*1.49*	-	*2.19*
90-94 let	1	-	1	*1.85*	-	*2.54*
95+ let	-	-	-	-	-	-
Celkem	383	271	112	*3.56*	*5.13*	*2.04*

Table 3. Reported numbers of TB cases by previous treatment in regions of the Czech Republic

Territory, region [1)]	Reported TB cases			
	absolute numbers		per 100,000 population	
	previously treated		previously treated	
	yes	no	yes	no
Czech Republic	30	353	0.28	3.28
Capital of Prague	10	87	0.75	6.50
Central Bohemian	1	41	0.07	2.87
South Bohemian	2	13	0.31	2.00
Plzeň	2	19	0.33	3.18
Karlovy Vary	-	12	-	4.12
Ústí nad Labem	3	36	0.37	4.44
Liberec	1	6	0.22	1.34
Hradec Králové	2	22	0.36	3.98
Pardubice	1	11	0.19	2.09
Vysočina	1	9	0.20	1.76
South Moravian	3	44	0.25	3.64
Olomouc	-	14	-	2.22
Zlín	2	9	0.35	1.55
Moravian-Silesian	2	30	0.17	2.53

[1)] Regions of patients' residence are reported

Table 4. Reported numbers of TB cases by disease location in regions of the Czech Republic

Territory, region [1)]	Pulmonary TB (pulmonary TB only and both pulmonary and extrapulmonary TB)		Extrapulmonary TB (only)	
	absolute numbers	per 100,000 population	absolute numbers	per 100,000 population
Czech Republic	338	3.14	45	0.42
Capital of Prague	82	6.13	15	1.12
Central Bohemian	35	2.45	7	0.49
South Bohemian	14	2.16	1	0.15
Plzeň	21	3.51	-	-
Karlovy Vary	11	3.77	1	0.34
Ústí nad Labem	37	4.57	2	0.25
Liberec	7	1.57	-	-
Hradec Králové	20	3.62	4	0.72
Pardubice	8	1.52	4	0.76
Vysočina	9	1.76	1	0.20
South Moravian	44	3.64	3	0.25
Olomouc	14	2.22	-	-
Zlín	9	1.55	2	0.35
Moravian-Silesian	27	2.27	5	0.42

[1)] Regions of patients' residence are reported

Table 5. Resistance to antitubercular drugs

Resistance	Reported TB cases					
	previously treated yes		previously treated no		total	
	abs. numbers	%	abs. numbers	%	abs. numbers	%
Patients with TB resistant to certain drugs	21	100.0	277	100.0	298	100.0
Any resistance to:						
isoniazid (H)	3	14.3	26	9.4	29	9.7
rifampicin (R)	2	9.5	15	5.4	17	5.7
ethambutol (E)	-	-	11	4.0	11	3.7
streptomycin (S)	2	9.5	27	9.7	29	9.7
pyrazinamid (Z)	-	-	15	5.4	15	5.0
Resistance only to:	-	-	-	-	-	-
isoniazid (H)	-	-	7	2.5	7	2.3
rifampicin (R)	-	-	-	-	-	-
ethambutol (E)	-	-	-	-	-	-
streptomycin (S)	1	4.8	9	3.2	10	3.4
pyrazinamid (Z)	-	-	7	2.5	7	2.3
Mono-resistance in total	1	4.8	23	8.3	24	8.1
H + R	2	9.5	2	0.7	4	1.3
H + R + E	-	-	-	-	-	-
H + R + S	-	-	3	1.1	3	1.0
H + R + Z	-	-	-	-	-	-
H + R + E + S	-	-	3	1.1	3	1.0
H + R + E + Z	-	-	-	-	-	-
H + R + S + Z	-	-	1	0.4	1	0.3
H + R + E + S + Z	-	-	6	2.2	6	2.0
Multidrug resistance (MDR) in total	2	9.5	15	5.4	17	5.7
H + E	-	-	-	-	-	-
H + S	1	4.8	2	0.7	3	1.0
H + Z	-	-	-	-	-	-
H + E + S	-	-	2	0.7	2	0.7
H + E + Z	-	-	-	-	-	-
H + S + Z	-	-	-	-	-	-
H + E + S + Z	-	-	-	-	-	-
R + E	-	-	-	-	-	-
R + S	-	-	-	-	-	-

R + Z	-	-	-	-	-	-
R + E + S	-	-	-	-	-	-
R + E + Z	-	-	-	-	-	-
R + S + Z	-	-	-	-	-	-
R + E + S + Z	-	-	-	-	-	-
E + S	-	-	-	-	-	-
E + Z	-	-	-	-	-	-
E + S + Z	-	-	-	-	-	-
S + Z	-	-	1	0.4	1	0.3
Poly-resistance in total (other than MDR)	1	4.8	5	1.8	6	2.0

Table 6. Reported numbers of TB cases in foreign nationals by country of birth

Year	Reported TB cases									% of the total number of reported TB cases
	Total	out of which								
		Ukraine	Vietnam	India	Slovakia	Philippines	Poland	Romania	Others	
2022	166	88	17	9	7	6	6	6	27	43.3

Table 7. Evaluation of antituberculosis therapy at 12 months after its start in TB cases reported into RTB in 2021 (Treatment outcome monitoring)

Treatment outcome		Reported TB cases in total		Previously untreated TB cases, verification from sputum or LS	
		abs. numbers	%	abs. numbers	%
Total number of reported TB cases in 2021		357	x	212	x
TB was excluded		1	x	-	x
Verified TB cases reported in 2021		356	100.0	212	100.0
Cured / treatment completed		235	66.0	141	66.5
Death	**from TB**	33	9.3	19	9.0
	from another cause	33	9.3	8	3.8
Treatment interrupted / missing data / missing follow-up report		33	9.3	23	10.8
Still on treatment		14	3.9	13	6.1
Patient transferred		8	2.2	8	3.8
Treatment failed		-	-	-	-

Table 8. Reported numbers of TB deaths in regions of the Czech Republic [2)]

Territory, region [1)]	Number of deaths	
	absolute numbers	per 100,000 population
Czech Republic	25	0.23
Capital of Prague	5	0.37
Central Bohemian	5	0.35
South Bohemian	1	0.15
Plzeň	2	0.33
Karlovy Vary	2	0.69
Ústí nad Labem	3	0.37
Liberec	-	0.00
Hradec Králové	1	0.18
Pardubice	-	0.00
Vysočina	-	0.00
South Moravian	5	0.41
Olomouc	-	0.00
Zlín	-	0.00
Moravian-Silesian	1	0.08

[1)] Regions of patients' residence are reported

[2)] Including additionally reported deaths from previous periods

Table 9. Reported numbers of cases of mycobacterial infections other than TB

Disease group	Patients with mycobacterial infections Diagnosis A31	
	absolute numbers	per 100,000 population
Pulmonary mycobacterial infection	87	0.81
Extrapulmonary mycobacterial infection	27	0.25
Reported infections in total	114	1.06
out of which, the following strains were isolated:		
M.AVIUM	46	0.43
M.XENOPI	19	0.18
M.INTRACELLULARE	13	0.12
M.KANSASII	11	0.10
M.GORDONAE	3	0.03
M.FORTUITUM	2	0.02
M.MARINUM	2	0.02
M.CHIMAERA	1	0.01
M. others/undetermined	17	0.16

Table 10. Reported numbers of cases of mycobacterial infections other than TB in regions of the Czech Republic

Territory, region [1)]	Reported cases of pulmonary mycobacterial infections		Reported cases of extrapulmonary mycobacterial infections	
	absolute numbers	per 100,000 population	absolute numbers	per 100,000 population
Czech Republic	87	0.81	27	0.25
Capital of Prague	17	1.27	3	0.22
Central Bohemian	6	0.42	3	0.21
South Bohemian	2	0.31	1	0.15
Plzeň	4	0.67	-	-
Karlovy Vary	1	0	1	0.34
Ústí nad Labem	12	1.48	1	0.12
Liberec	1	0.22	1	0
Hradec Králové	7	1.27	3	0.54
Pardubice	2	0.38	1	0.19
Vysočina	2	0.39	6	1.17
South Moravian	12	0.99	1	0.08
Olomouc	4	0.64	3	0.48
Zlín	4	0.69	-	-
Moravian-Silesian	13	1.09	3	0.25

[1)] Regions of patients' residence are reported