Centre for the development of technology platform used in registries of the National Health Information System, modernisation of data mining within these registries and extending their information capacity.
Development of the NHIS Technology Platform — CZ.03.4.74/0.0/0.0/15_019/0002748

Development of the NHIS Technology Platform

Basic Overview of Tuberculosis Epidemiology in the Czech Republic in 2018

Czech Health Statistics
Published by the Institute of Health Information and Statistics of the Czech Republic
Palackého nám. 4, Prague, Czech Republic
www.uzis.cz

European Union
European Social Fund
Operational Programme Employment

Institute of Health Information and Statistics of the Czech Republic
Institute of Biostatistics and Analyses of the Masaryk University
Joint workplace

Contents

www.uzis.cz

Basic Overview of Tuberculosis Epidemiology in the Czech Republic in 2018

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), namely by its Department of Strategy and Management of Public Health Protection and Promotion. 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 will be developed during the year 2019, providing a better insight into this issue; the tool will be designed in an interactive way, offering many different (and adjustable) points of view.

Methodology

The tabular outputs summarise TB epidemiology in the Czech Republic in 2018, based on data from RTB valid as of 20 June 2019. 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 2017. 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.

Summary of Results

In 2018, a total of 444 TB cases (i.e. 4.2 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 decreased (in 2018, there were 61 less than in 2017). 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 31 persons who had been previously treated with antitubercular agents (Table 3).

From the total number of reported TB cases in 2018, definitive diagnosis of TB was confirmed in 355 cases – 80.0% (in the Hradec Králové Region, only 9 out of 19 reported TB cases (47.4%) were positive culturally), of which 278 cases were verified from sputum or from the laryngeal swab (LS). Sputum smear microscopy was positive in 144 patients (32.4%) (Table 1).

According to RTB data, pulmonary TB was reported in 398 cases (89.6%); these cases also involved patients who had both pulmonary and extrapulmonary TB. By contrast, extrapulmonary TB only was reported in 46 cases (Table 4).

TB occurred much more frequently in men than in women: men accounted for almost 70% of cases. The highest numbers of patients were in older age categories. TB was most frequently reported in people aged 40–64 years; when recalculated per 100,000 population, men in the 6th decade of life and persons of both sexes over 80 years were most frequently affected. When compared to 2017, there was a year-on-year decrease in TB cases reported among patients in younger age groups; there was no change in TB cases reported among patients younger than 20 years, though: 13 (in 2017 there were 13 cases too) but the number of patients in the age group of 20–29 years was lower: 52 (4 less cases). Among patients there were 5 in the age group of 0–14 years (in 2018, there was 1 less case than in 2017), of which all were under 5 years of age (Tab. 2).

Just as in previous years, the Capital of Prague was the residence of most TB patients (96; 7.4 per 100,000 population) reported in 2018. Higher numbers of TB cases than the national mean of 4.8 per 100,000 population were also reported in the Ústí nad Labem Region (6.7 per 100,000), the Plzeň Region (5.8 per 100,000) and the Central Bohemian Region (4.3 per 100,000). By contrast, the lowest absolute numbers of TB cases were reported in the Zlín Region (5; 0.9 per 100,000) and the Karlovy Vary Region (6; 2.0 per 100,000 (Table 1).

TB cases of 147 persons born outside the Czech Republic were reported into RTB in 2018, accounting for more than 33% of the total number of reported TB cases. Most of these people were citizens of Ukraine (37 persons), Slovakia (24), Romania (16), Vietnam (12) and Mongolia (9) (Table 6).

In 2018, sensitivity to antitubercular agents was tested in 323 patients. Isoniazid, streptomycin, rifampicin, ethambutol and pyrazinamide resistance were detected in 25 (7.7%), 21 (6.5%), 12 (3.7%), 12 (3.7%) and 12 (3.7%) cases, respectively. Multidrug-resistant TB was detected in 12 cases (3.7%). More information on resistance to antitubercular drugs is available in Table 5.

From the total number of newly detected TB cases in 2017 that were verified from sputum or from the laryngeal swab (289 cases), evaluation of antituberculosis therapy at 12 months after its start (Treatment outcome monitoring) has shown that 208 persons (72.0%) were successfully treated and 26 persons (9.0%) died, out of which 12 died from TB. After one year, treatment continued in 12 persons (4.2%). Eight persons (2.8%) moved elsewhere; treatment was interrupted or data on treatment were missing in 34 persons (11.8%) (Table 7).

In 2018, a total of 26 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 Central Bohemian Region (9 persons) (Table 8).

Apart from tuberculosis, cases of other mycobacterial infections are reported into RTB, too. In 2018, there were 128 reported cases of other mycobacterial infections (in 2017, there were 89 cases), i.e. 1.21 cases per 100,000 population. Within these cases, there were 88 cases with pulmonary location and 40 cases with extrapulmonary location. M. avium (67 cases) and M. intracellulare (16 cases) were the most frequently isolated strains (Table 9). Mycobacterial infections are most frequently reported in the Moravian-Silesian Region (21 cases) and the Ústí nad Labem Region (19 cases) (Table 10), when recalculated per 100,000 population, there were most cases in the Plzeň region (2.6 per 100,000 population).

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

Territory, region [1)]	Reported TB cases in total		Culturally positive TB cases		Culturally 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	444	4.18	355	3.34	278	2.62	144	1.36
Capital of Prague	96	7.38	76	5.84	61	4.69	32	2.46
Central Bohemian	58	4.26	52	3.82	36	2.65	17	1.25
South Bohemian	14	2.18	14	2.18	11	1.72	7	1.09
Plzeň	34	5.84	27	4.63	23	3.95	10	1.72
Karlovy Vary	6	2.03	6	2.03	5	1.69	1	0.34
Ústí nad Labem	55	6.70	41	5.00	28	3.41	15	1.83
Liberec	16	3.62	12	2.72	10	2.26	6	1.36
Hradec Králové	19	3.45	9	1.63	7	1.27	-	-
Pardubice	19	3.66	15	2.89	13	2.50	7	1.35
Vysočina	20	3.93	18	3.54	17	3.34	12	2.36
South Moravian	48	4.05	38	3.21	27	2.28	16	1.35
Olomouc	17	2.69	16	2.53	14	2.21	6	0.95
Zlín	5	0.86	4	0.69	4	0.69	1	0.17
Moravian-Silesian	37	3.07	27	2.24	22	1.83	14	1.16

[1)] Regions of patients' residence are reported

Table 2. Reported numbers of TB cases by age groups and sex

Age group (years)	Reported TB cases					
	absolute numbers			per 100,000 population		
	total	men	women	total	men	women
0–4	5	2	3	0.89	0.69	1.09
5–9	-	-	-	-	-	-
10–14	-	-	-	-	-	-
15–19	8	5	3	1.72	2.09	1.33
20–24	16	11	5	3.13	4.20	2.00
25–29	36	28	8	5.35	8.12	2.44
30–34	34	24	10	4.69	6.43	2.85
35–39	29	15	14	3.62	3.63	3.61
40–44	49	38	11	5.24	7.91	2.42
45–49	39	30	9	5.11	7.66	2.42
50–54	54	43	11	7.76	12.15	3.22
55–59	35	31	4	5.62	9.96	1.28
60–64	38	28	10	5.52	8.42	2.81
65–69	30	21	9	4.40	6.64	2.46
70–74	19	13	6	3.28	5.12	1.84
75–79	20	7	13	5.39	4.62	5.92
80–84	14	7	7	6.14	8.41	4.84
85–89	12	4	8	8.45	8.79	8.29
90–94	6	-	6	11.87	-	16.07
Total	444	307	137	4.18	5.87	2.54

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

Territory, region [1)]	Reported TB cases			
	absolute numbers previously treated		per 100,000 population previously treated	
	yes	no	yes	no
Czech Republic	31	413	0.29	3.89
Capital of Prague	10	86	0.77	6.61
Central Bohemian	7	51	0.51	3.75
South Bohemian	3	11	0.47	1.72
Plzeň	2	32	0.34	5.49
Karlovy Vary	-	6	-	2.03
Ústí nad Labem	3	52	0.37	6.34
Liberec	-	16	-	3.62
Hradec Králové	-	19	-	3.45
Pardubice	1	18	0.19	3.47
Vysočina	1	19	0.20	3.73
South Moravian	1	47	0.08	3.97
Olomouc	1	16	0.16	2.53
Zlín	-	5	-	0.86
Moravian-Silesian	2	35	0.17	2.91

[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	398	3.75	46	0.43
Capital of Prague	88	6.76	8	0.61
Central Bohemian	50	3.67	8	0.59
South Bohemian	12	1.87	2	0.31
Plzeň	32	5.49	2	0.34
Karlovy Vary	5	1.69	1	0.34
Ústí nad Labem	48	5.85	7	0.85
Liberec	15	3.40	1	0.23
Hradec Králové	16	2.91	3	0.54
Pardubice	16	3.08	3	0.58
Vysočina	19	3.73	1	0.20
South Moravian	41	3.46	7	0.59
Olomouc	15	2.37	2	0.32
Zlín	5	0.86	-	-
Moravian-Silesian	36	2.99	1	0.08

[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	20	100.0	303	100.0	323	100.0
Any resistance to:						
isoniazid (H)	1	5.0	24	7.9	25	7.7
rifampicin (R)	-	-	12	4.0	12	3.7
ethambutol (E)	-	-	12	4.0	12	3.7
streptomycin (S)	-	-	21	6.9	21	6.5
pyrazinamid (Z)	1	5.0	11	3.6	12	3.7
Resistance only to:						
isoniazid (H)	1	5.0	5	1.7	6	1.9
rifampicin (R)	-	-	-	-	-	-
ethambutol (E)	-	-	-	-	-	-
streptomycin (S)	-	-	5	1.7	5	1.5
pyrazinamid (Z)	1	5.0	7	2.3	8	2.5
Mono-resistance in total	2	10.0	17	5.6	19	5.9
H + R	-	-	2	0.7	2	0.6
H + R + E	-	-	-	-	-	-
H + R + S	-	-	1	0.3	1	0.3
H + R + Z	-	-	-	-	-	-
H + R + E + S	-	-	5	1.7	5	1.5
H + R + E + Z	-	-	-	-	-	-
H + R + S + Z	-	-	-	-	-	-
H + R + E + S + Z	-	-	4	1.3	4	1.2
Multidrug resistance (MDR) in total	-	-	12	4.0	12	3.7
H + E	-	-	1	0.3	1	0.3
H + S	-	-	4	1.3	4	1.2
H + Z	-	-	-	-	-	-
H + E + S	-	-	2	0.7	2	0.6
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	-	-	-	-	-	-
Poly-resistance in total (other than MDR)	-	-	7	2.3	7	2.2

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	Slovakia	Vietnam	Mongolia	Romania	other	
2018	147	37	24	16	12	9	49	33.1

Table 7. Evaluation of antituberculosis therapy at 12 months after its start in TB cases reported into RTB in 2017 (Treatment outcome monitoring)

Treatment outcome	Reported TB cases in total		Newly diagnosed TB cases, verification from sputum or LS	
	abs. numbers	%	abs. numbers	%
Total number of reported TB cases in 2017	505	x	290	x
TB was excluded	4	x	1	x
Verified TB cases reported in 2017	501	100.0	289	100.0
Cured / treatment completed	341	68.1	208	72.0
Death from TB	26	5.2	12	4.2
Death from another cause	40	8.0	14	4.8
Treatment interrupted / missing data / missing follow-up report	58	11.6	34	11.8
Still on treatment	21	4.2	12	4.2
Patient transferred	13	2.6	8	2.8
Treatment failed	2	0.4	1	0.3

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	26	0.24
Capital of Prague	6	0.46
Central Bohemian	9	0.66
South Bohemian	2	0.31
Plzeň	3	0.51
Karlovy Vary	-	-
Ústí nad Labem	1	0.12
Liberec	-	-
Hradec Králové	-	-
Pardubice	1	0.19
Vysočina	-	-
South Moravian	3	0.25
Olomouc	-	-
Zlín	-	-
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	88	0.83
Extrapulmonary mycobacterial infection	40	0.38
Reported infections in total	128	1.20
out of which, the following strains were isolated:		
M. avium	67	0.63
M. avium-intracellulare	16	0.15
M. intracelullare	5	0.05
M. kansasii	13	0.12
M. xenopi	14	0.13
other M.	12	0.11

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	88	0.83	40	0.38
Capital of Prague	11	0.85	6	0.46
Central Bohemian	6	0.44	8	0.59
South Bohemian	5	0.78	3	0.47
Plzeň	13	2.23	2	0.34
Karlovy Vary	-	-	1	0.34
Ústí nad Labem	11	1.34	8	0.97
Liberec	2	0.45	-	-
Hradec Králové	2	0.36	5	0.91
Pardubice	2	0.39	-	-
Vysočina	1	0.20	-	-
South Moravian	1	0.08	3	0.25
Olomouc	9	1.42	2	0.32
Zlín	4	0.69	2	0.34
Moravian-Silesian	21	1.74	-	-

[1)] Regions of patients' residence are reported