

Development of the NHIS Technology Platform

Basic Overview of Tuberculosis Epidemiology in the Czech Republic in 2015

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

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Basic Overview of Tuberculosis Epidemiology in the Czech Republic in 2015

Introduction

The publication “Basic Overview of Tuberculosis Epidemiology in the Czech Republic in 2015” picks up the threads of the publication “Tuberculosis and Respiratory Diseases”, which was regularly published by the Institute of Health Information and Statistics of the Czech Republic (IHIS) 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 established 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 2017, 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 2015, based on data from RTB valid as of 3 March 2017. 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 2014. The last table, unlike all the preceding ones, provides 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 2015, a total of 518 TB cases (i.e. 4.9 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 remained almost unchanged (in 2015, there were 4 more cases than in 2014). Despite a slight increase in the last two years, there has been a 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 44 persons who had been previously treated with antitubercular agents (Table 3).

From the total number of reported TB cases in 2015, definitive diagnosis of TB was confirmed in 391 cases (75.5%), of which 329 cases were verified from sputum or from the laryngeal swab (LS). Sputum smear microscopy was positive in 221 patients (42.7%) (Table 1).

According to RTB data, pulmonary TB was reported in 451 cases (87.1%); these cases also involved patients who had both pulmonary and extrapulmonary TB. By contrast, extrapulmonary TB only was reported in 67 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 40–59 years; when recalculated per 100,000 population, people aged over 85 years were most frequently affected. In 2015, only five children under the age of 15 were diagnosed with TB: three boys and two girls (Table 2).

Just as in previous years, the Capital of Prague was the residence of most TB patients (9.1 per 100,000 population) reported in 2015. Higher numbers of TB cases than the national mean of 4.9 per 100,000 population were also reported in the Ústí nad Labem Region (6.4 per 100,000), the South Moravian Region (5.8 per 100,000), the Plzeň Region (5.4 per 100,000) and the Liberec Region (5.2 per 100,000). By contrast, the lowest numbers of TB cases were reported in the Zlín Region (2.1 per 100,000) (Table 1).

TB cases in 110 foreign nationals (i.e. persons born outside the Czech Republic) were reported into RTB in 2015, accounting for 21.2% of the total number of reported TB cases. Most of these people were citizens of Slovakia (26 persons), Ukraine (24), Vietnam (11) and Romania (10) (Table 6).

In 2015, sensitivity to antitubercular agents was tested in 368 patients. Streptomycin, isoniazid, rifampicin and ethambutol resistance was detected in 20 (5.4%), 15 (4.1%), 10 (2.7%) and 5 (1.4%) cases, respectively. Multidrug-resistant TB was detected in 10 cases (2.7%). More information on resistance to antitubercular drugs is available in Table 5.

From the total number of newly detected TB cases in 2014 that were verified from sputum or from the laryngeal swab (290 cases), evaluation of antituberculosis therapy at 12 months after its start (Treatment outcome monitoring) has shown that 214 persons (73.8%) were successfully treated and 41 persons (14.1%) died, out of which 14 died from TB. After one year, treatment continued in 10 persons (3.4%). Six persons (2.1%) moved elsewhere; treatment was interrupted or data on treatment were missing in 19 persons (6.6%) (Table 7).

In 2015, a total of 33 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 (9 persons) and in the Central Bohemian Region (7 persons) (Table 8).

Apart from tuberculosis, cases of other mycobacterial infections are reported into RTB, too. In 2015, there were 116 reported cases of other mycobacterial infections, i.e. 1.1 cases per 100,000 population. Within these cases, there were 90 cases with pulmonary location and 26 cases with extrapulmonary location. *M. avium* (51 cases) and *M. kansasii* (19 cases) were the most frequently isolated strains (Table 9).

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	518	4.91	391	3.71	329	3.12	221	2.10
Capital of Prague	115	9.11	101	8.00	81	6.42	54	4.28
Central Bohemian	52	3.94	42	3.18	37	2.80	24	1.82
South Bohemian	16	2.51	14	2.20	11	1.73	6	0.94
Plzeň	31	5.39	26	4.52	23	4.00	11	1.91
Karlovy Vary	10	3.35	4	1.34	3	1.01	3	1.01
Ústí nad Labem	53	6.44	36	4.37	32	3.89	20	2.43
Liberec	23	5.24	14	3.19	11	2.50	14	3.19
Hradec Králové	21	3.81	9	1.63	7	1.27	6	1.09
Pardubice	18	3.49	13	2.52	13	2.52	6	1.16
Vysočina	18	3.53	11	2.16	8	1.57	7	1.37
South Moravian	68	5.79	53	4.52	46	3.92	31	2.64
Olomouc	25	3.94	16	2.52	12	1.89	9	1.42
Zlín	12	2.05	9	1.54	6	1.03	4	0.68
Moravian-Silesian	56	4.61	43	3.54	39	3.21	26	2.14

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	4	2	2	0.72	0.70	0.74
5-9	-	-	-	-	-	-
10-14	1	1	-	0.21	0.41	-
15-19	4	1	3	0.87	0.42	1.34
20-24	25	13	12	4.12	4.19	4.05
25-29	19	13	6	2.74	3.66	1.77
30-34	34	27	7	4.58	7.06	1.94
35-39	29	21	8	3.22	4.54	1.83
40-44	50	40	10	5.82	9.06	2.39
45-49	50	42	8	7.20	11.82	2.36
50-54	60	46	14	8.87	13.43	4.19
55-59	50	39	11	7.50	11.83	3.27
60-64	40	30	10	5.52	8.65	2.65
65-69	43	30	13	6.31	9.56	3.53
70-74	41	24	17	8.39	11.31	6.15
75-79	27	15	12	8.54	11.86	6.33
80-84	21	8	13	8.97	9.51	8.66
85-89	15	6	9	11.27	14.62	9.78
90-94	5	3	2	10.82	25.99	5.77
Total	518	361	157	4.91	6.97	2.93

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	44	474	0.42	4.50
Capital of Prague	13	102	1.03	8.08
Central Bohemian	5	47	0.38	3.56
South Bohemian	-	16	-	2.51
Plzeň	3	28	0.52	4.86
Karlovy Vary	-	10	-	3.35
Ústí nad Labem	4	49	0.49	5.95
Liberec	3	20	0.68	4.55
Hradec Králové	2	19	0.36	3.45
Pardubice	-	18	-	3.49
Vysočina	2	16	0.39	3.14
South Moravian	7	61	0.60	5.20
Olomouc	1	24	0.16	3.78
Zlín	1	11	0.17	1.88
Moravian-Silesian	3	53	0.25	4.36

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	451	4.28	67	0.64
Capital of Prague	104	8.24	11	0.87
Central Bohemian	44	3.33	8	0.61
South Bohemian	12	1.88	4	0.63
Plzeň	27	4.69	4	0.69
Karlovy Vary	7	2.35	3	1.01
Ústí nad Labem	46	5.59	7	0.85
Liberec	21	4.78	2	0.46
Hradec Králové	15	2.72	6	1.09
Pardubice	17	3.29	1	0.19
Vysočina	17	3.34	1	0.20
South Moravian	62	5.28	6	0.51
Olomouc	24	3.78	1	0.16
Zlín	9	1.54	3	0.51
Moravian-Silesian	46	3.79	10	0.82

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	27	100.0	341	100.0	368	100.0
Any resistance to:						
isoniazid (H)	2	7.4	13	3.8	15	4.1
rifampicin (R)	2	7.4	8	2.3	10	2.7
ethambutol (E)	1	3.7	4	1.2	5	1.4
streptomycin (S)	2	7.4	18	5.3	20	5.4
Resistance only to:						
isoniazid (H)	-	-	3	0.9	3	0.8
rifampicin (R)	-	-	-	-	-	-
ethambutol (E)	-	-	-	-	-	-
streptomycin (S)	-	-	8	2.3	8	2.2
Mono-resistance in total	-	-	11	3.2	11	3.0
H + R	-	-	-	-	-	-
H + R + E	-	-	-	-	-	-
H + R + S	1	3.7	4	1.2	5	1.4
H + R + E + S	1	3.7	4	1.2	5	1.4
Multidrug resistance (MDR) in total	2	7.4	8	2.3	10	2.7
H + E	-	-	-	-	-	-
H + S	-	-	2	0.6	2	0.5
H + E + S	-	-	-	-	-	-
R + E	-	-	-	-	-	-
R + S	-	-	-	-	-	-
R + E + S	-	-	-	-	-	-
E + S	-	-	-	-	-	-
Poly-resistance in total (other than MDR)	-	-	2	0.6	2	0.5

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					
		Slovakia	Ukraine	Vietnam	Romania	other	
2015	110	26	24	11	10	39	21.2

Table 7. Evaluation of antituberculosis therapy at 12 months after its start in TB cases reported into RTB in 2014 (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 2014	514	x	290	x
TB was excluded	3	x	-	x
Verified TB cases reported in 2014	511	100.0	290	100.0
Cured / treatment completed	380	74.4	214	73.8
Death from TB	22	4.3	14	4.8
Death from another cause	51	10.0	27	9.3
Treatment interrupted / missing data / missing follow-up report	36	7.0	19	6.6
Still on treatment	14	2.7	10	3.4
Patient transferred	7	1.4	6	2.1
Treatment failed	1	0.2	-	-

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	33	0.31
Capital of Prague	9	0.71
Central Bohemian	7	0.53
South Bohemian	-	-
Plzeň	1	0.17
Karlovy Vary	2	0.67
Ústí nad Labem	4	0.49
Liberec	-	-
Hradec Králové	-	-
Pardubice	1	0.19
Vysočina	1	0.20
South Moravian	3	0.26
Olomouc	1	0.16
Zlín	-	-
Moravian-Silesian	4	0.33

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	90	0.85
Extrapulmonary mycobacterial infection	26	0.25
Reported infections in total	116	1.10
out of which, the following strains were isolated:		
M. avium	51	0.48
M. intracellulare	11	0.10
M. kansasii	19	0.18
M. xenopi	15	0.14
other M.	20	0.19