TUBERCULOSIS

IN JAPAN

ANNUAL REPORT – 2020

About the Tuberculosis Surveillance Center

The Tuberculosis Surveillance Center, located within the Department of Epidemiology and Clinical Research, the Research Institute of Tuberculosis, Japan, is committed to providing technical support for the national computerized tuberculosis surveillance system, as well as compiling annual TB report, analyzing surveillance data and disseminating findings to all those involved in TB control in Japan.

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Acknowledgement

Notes on the report

This report presents detailed data on TB case notifications made to the Japan TB Surveillance System to the end of 2019. It is largely based on the Book of TB Statistics, published by the Japan Anti-Tuberculosis Association, and available as a printed report in Japanese, however, several additional and original analyses are made for international readers.

All figures in this report are available for download as a separate slide set also at http://www.jata.or.jp/rit/ekigaku/en/statistics-of-tb/.

Chapter 1: Tuberculosis case report, 2010-2019

Overall numbers and rates:

In 2019, 14,460 cases of tuberculosis (TB) were newly notified, and the notification rate per 100,000 population was 11.5 for all TB.

As shown in Figure 1, both the number of new cases and notification rates per 100,000 have continued to decline steadily towards the national target of below 10 per 100,000 by year 2020 (see also Table s1).

Figure 1. TB notification and rates, 2010-2019
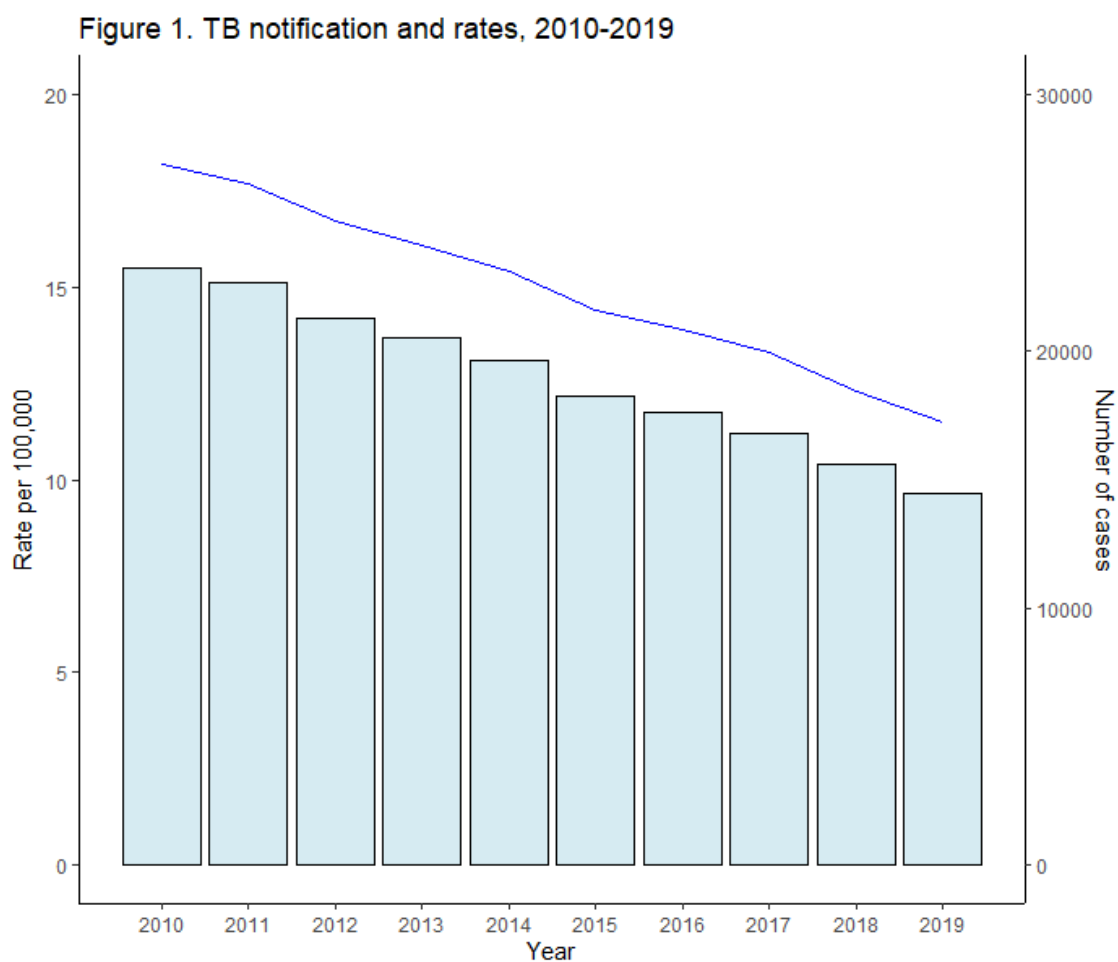
Age and sex:

In 2019, 58.9% of the notified cases were males (8,521 / 14,460) and 41.1% were females (5,939 / 14,460).

The largest number of cases were diagnosed among those aged 85 to 89 (2,110 cases, a rate of 58.4 per 100,000), followed by those aged 90+ (1,967 cases, a rate of 85.2 per 100,000). The rates were consistently higher among males than females in all age groups except among those aged 0 to 4(see Table s2).

Among the elderly aged 65 and above, only the age group 85 years old and above had continued to increase in the number of cases until 2014 – however, since 2016, the number has begun to decline (Figure 2, see also Table s3).

Figure 2. TB notification among the elderly, 2010-2019
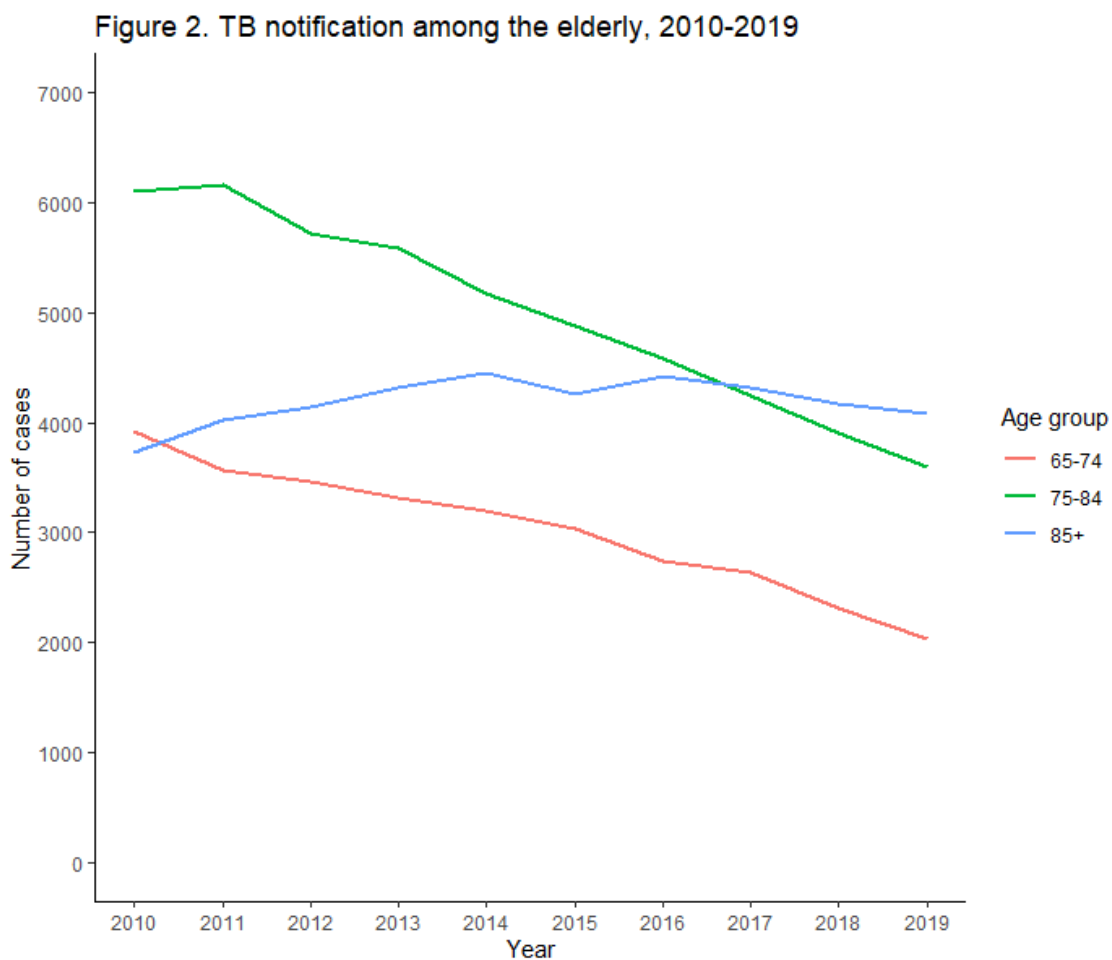
Geographical distribution:

In terms of regional disparities, large variation existed between the 47 prefectures of Japan, with the notification rate ranging from 6.8 per 100,000 in Iwate and Akita prefecture to 18.4 per 100,000 in Osaka prefecture (Map 1, see also Table s4). In 22 of the 47 prefectures, the notification rate has decreased to below the national target of 10 per 100,000.

Notification rate per 100,000, 2019

Legend:
- <10
- 10-12.3
- 12.4>
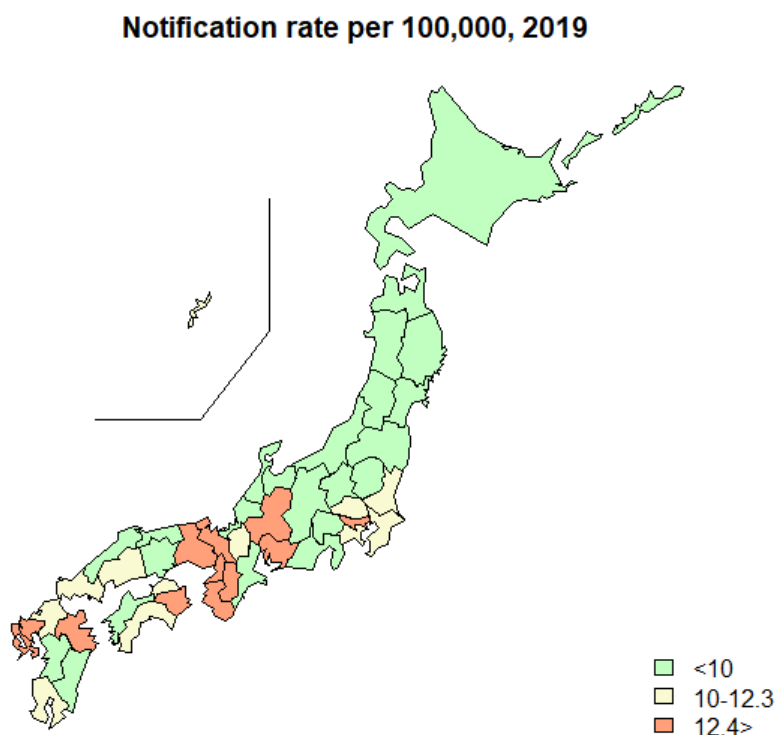
Map 1: TB notification rate by 47 prefectures of Japan, 2019

Occupation:

In 2019, among those aged 25 to 64, 73.3% (2,902 / 3,960) had some sort of job[1], while 18.3% (725 / 3,960) were unemployed, 2.3% (92 / 3,960) were houseworkers and 3.5% (138 / 3,960) were students.   2.6% (103 / 3,960) were recorded as "job unknown" (see Table s5).

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[1] Note that the 2,902 includes those whose job was recorded as "others" (n=115). This had been re-classified as "unemployed" until previous year, but is now not.

Social risk factors among those aged 25-64:

Social risk factors (SRF) are defined as the following: those either currently homeless or with history of being homeless within one year of diagnosis ("homeless"), those unemployed ("unemployed"), those receiving social welfare benefit at the time of diagnosis ("on social welfare"), and those not covered under any health insurance at the time of diagnosis, including those "eligible" but not being able to pay the premiums, and thus practically are not able to access the necessary health services ("no insurance"). "Homelessness", "unemployed", and "on social welfare" and "no insurance", are not mutually exclusive.

The demographic characteristics of those with each SRF by sex, age groups and country of birth are summarized in Table 1.   The proportions of those with SRFs are also summarized in Tables s6.a-s6.d. The proportions of those with SRFs tended to be higher among men than women, except being unemployed, among older than younger patients, and Japan-born than foreign-born patients.

Table 1. Characteristics of those with SRFs, by type of SRF, 2019

	Homeless		Unemployed		On social welfare		No insurance	
	n	%	n	%	n	%	n	%
TOTAL	59	100.0	725	100.0	229	100.0	24	100.0
Male	56	94.9	439	60.6	192	83.8	21	87.5
Female	3	5.1	286	39.4	37	16.2	3	12.5
Age group								
25-34	4	6.8	72	9.9	3	1.3	3	12.5
35-44	10	16.9	109	15.0	26	11.4	3	12.5
45-54	20	33.9	202	27.9	72	31.4	6	25.0
55-64	25	42.4	342	47.2	128	55.9	12	50.0
Country of birth								
Foreign-born	1	1.7	107	14.8	13	5.7	0	0.0
Japan-born	57	96.6	603	83.2	210	91.7	23	95.8
COB* unknown	1	1.7	15	2.1	6	2.6	1	4.2

COB = country of birth

Clinical characteristics:

In 2019, of the 14,460 newly notified cases, 76.7% (11,094 / 14,460) had pulmonary disease, either with or without concomitant extra-pulmonary disease, while 23.3% (3,366 / 14,460) had exclusive extra-pulmonary disease. Of the pulmonary TB cases, 86.7% (9,613 /11,094) were bacteriologically confirmed, while the proportion was much less at 49.1% (1,652/3,366) among those with exclusive extra-pulmonary disease (Table 2).

Of the 11,094 pulmonary cases, history of previous TB was known for 98.7% (10,947 / 11,094).   Among newly notified pulmonary cases with known history of previous TB, 95.0% (10,405 /10,947) were new cases. Of the 3,326 extra-pulmonary cases with known history of previous TB, 96.2% (3,201 / 3,326) were new cases (Table 2).

Table 2. Clinical characteristics of newly notified cases by treatment history, 2019

Tx history	PTB bac	PTB clin	PTB TOTAL	EPTB bac	EPTB clin	EPTB TOTAL
New	9,025	1,380	10,405	1,575	1,626	3,201
Retreatment	454	88	542	54	71	125
Unknown	134	13	147	23	17	40
TOTAL	9,613	1,481	11,094	1,652	1,714	3,366

Tx = treatment, PTB=pulmonary tuberculosis, EPTB = extra-pulmonary tuberculosis
clin = clinically confirmed, bac = bacteriologically confirmed

Looking at clinical characteristics by age groups, the proportion of bacteriologically confirmed among the pulmonary cases tended to increase with age, with 30.0% among those aged 0-4 compared with 94.5% among those aged 85 and above. The proportion of bacteriologically confirmed among the extra-pulmonary cases remained relatively constant among those aged 15 years old and above, and was the highest among those aged 25-34 at 60.7%, and the lowest among those aged 65-74 at 44.3%. Out of 13 cases of extra-pulmonary cases diagnosed among those aged 0-14, 4 were bacteriologically confirmed (Figure 3, see also Table s7).

Fig 3. Clinical characteristics by age groups, 2019
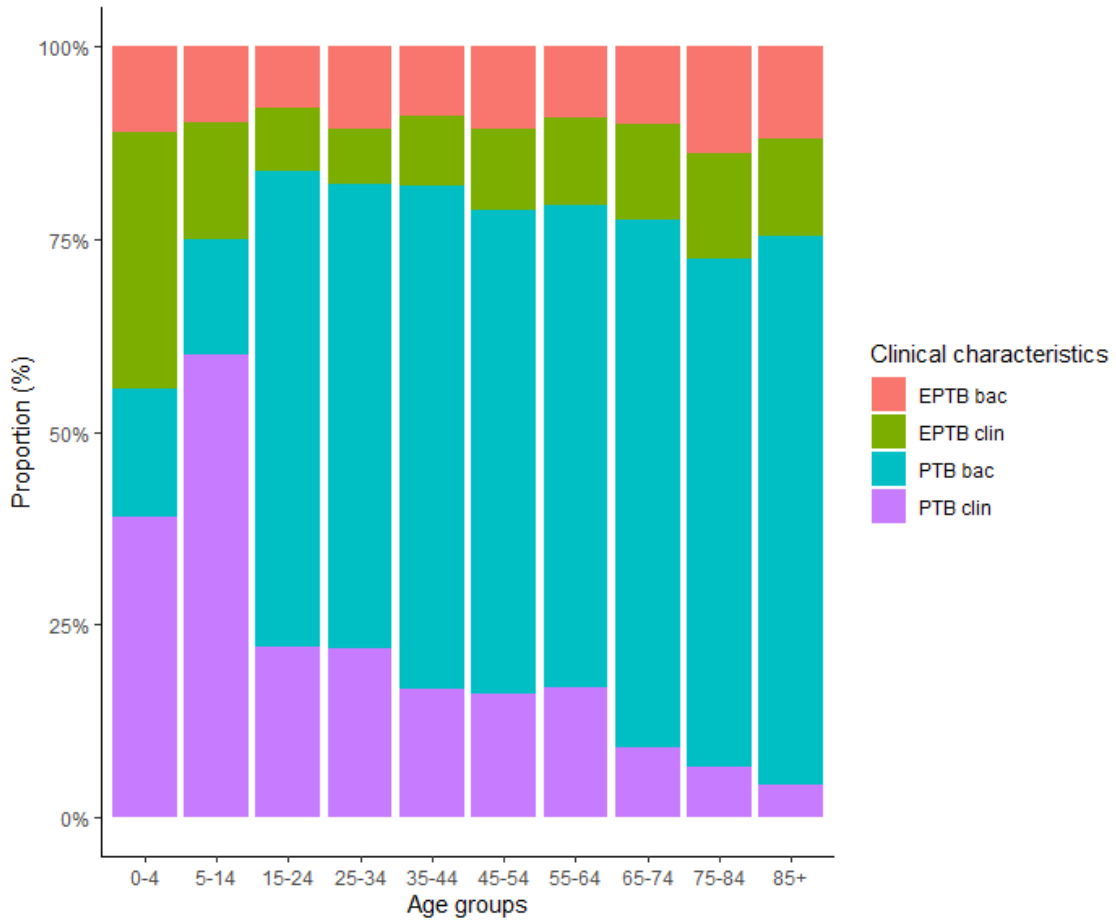
PTB = pulmonary tuberculosis, EPTB = extra-pulmonary tuberculosis
Clin = clinically confirmed, bac = bacteriologically confirmed

Chapter 2: Foreign-born TB, 2010-2019

Overall number and rates:

Information regarding place of birth (Japan-born/foreign-born) was known for 97.6% of the newly notified cases (14,108 / 14,460).   Of those cases, 10.9% was born outside Japan (1,541 / 14,108). Both the number of case notification per 100,000 have continued to increase, however it slightly decreased in 2019. (Figure 4, see also Table s8).

Figure 4. Foreign-born TB notification and rates, 2010-2019
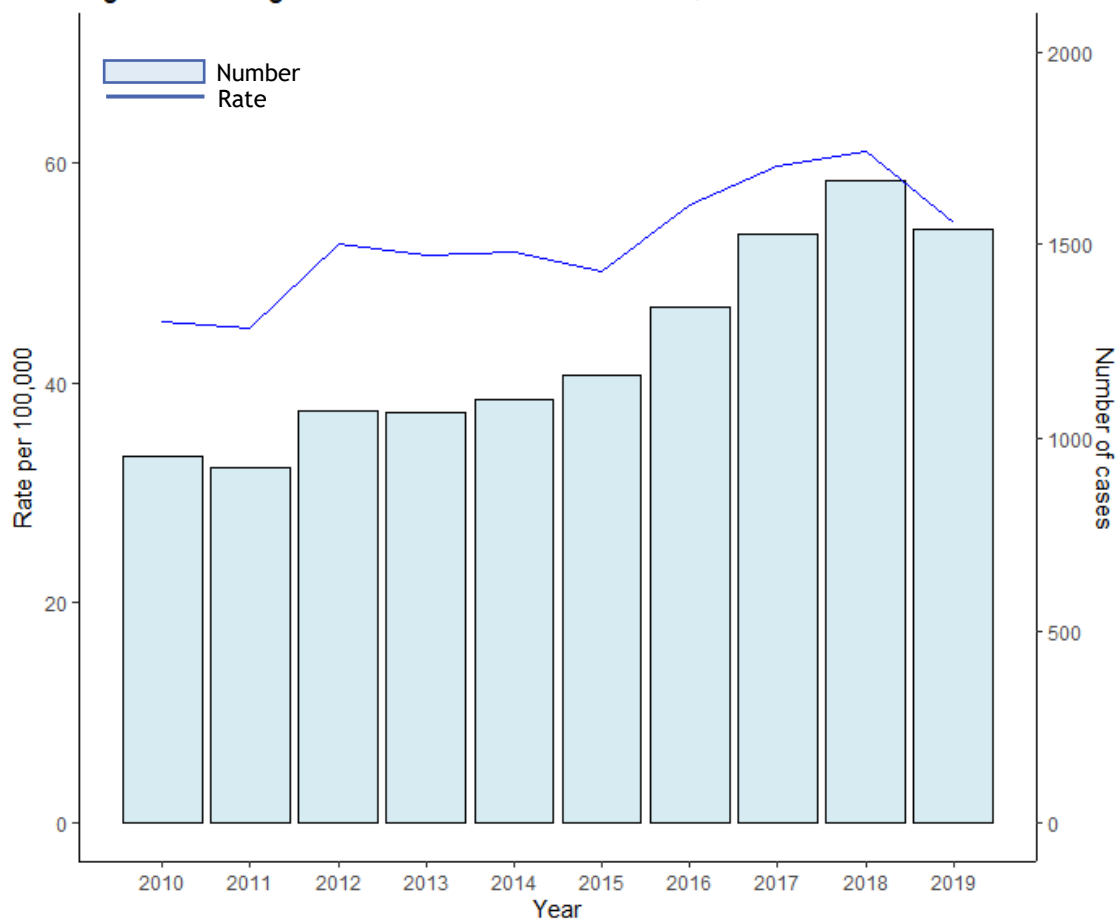
Age and sex:

In 2019, 53.8% of the foreign-born cases were males (829 / 1,541) and 46.2% were females (712 / 1,541). The largest number of cases were diagnosed among those aged 15 to 24 (554 cases), followed by those aged 25 to 34 (549 cases). 71.6% (1,103/1,541) of foreign-born persons were aged between 15 and 34 (Table 3).

Table 3: Foreign-born TB cases* by sex and age groups, 2019

Age group	Total		Male		Female	
	n	%	n	%	n	%
0-4	2	0.1	1	0.1	1	0.1
5-14	8	0.5	7	0.8	1	0.1
15-24	554	36.0	345	41.6	209	29.4
25-34	549	35.6	305	36.8	244	34.3
35-44	186	12.1	66	8.0	120	16.9
45-54	117	7.6	38	4.6	79	11.1
55-64	52	3.4	26	3.1	26	3.7
65-74	33	2.1	20	2.4	13	1.8
75-84	23	1.5	11	1.3	12	1.7
85+	17	1.1	10	1.2	7	1.0
TOTAL	1,541	100.0	829	100.0	712	100.0

*Note: exclude those whose country of birth is unknown

Looking at the trend, the proportion of foreign-born cases among the age group 15-34 has increased dramatically especially since 2011, while that among other age groups have increased steadily (Figure 5, see also Table s9).

Figure 5. Proportion of foreign-born TB notification by age groups, 2010-2019
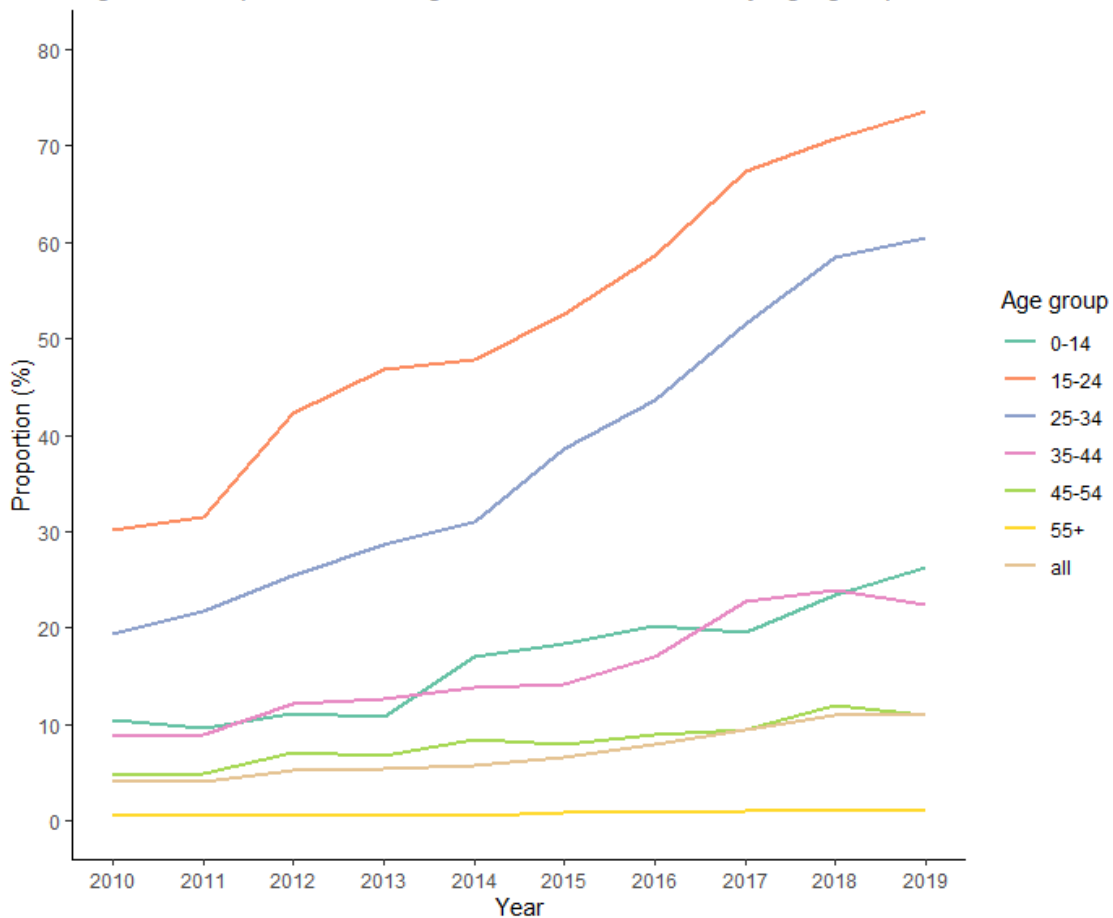
Country of birth and time of entry to Japan:

Table 4 summarizes the foreign-born TB cases by major countries of birth (see also Table s10). Vietnam was the most frequent country of birth for foreign-born cases notified in 2019 (21.5%, 331 / 1,541), followed by the Philippines and China (20.0%, 308 / 1,541 and 16.4%, 253 / 1,541).

Table 4: Foreign-born TB cases by country of birth, 2019

Country name	Cases	Proportion (%)
Vietnam	331	21.5
the Philippines	308	20.0
China	253	16.4
Indonesia	160	10.4
Nepal	146	9.5
Myanmar	53	3.4
Unknown	41	2.7
South Korea	36	2.3
India	32	2.1
Thailand	26	1.7
Cambodia	24	1.6
Brazil	23	1.5
Others	108	7.0
Total	1,541	100.0

Looking at the trend in the five most frequent countries of birth, the number of those from China has been relatively constant, those from Nepal and Indonesia have been increasing, but slightly declined in 2019. Those from Vietnam have continued to increase. (Figure 6, see also Table s11).

Figure 6. Foreign-born TB notifications in selected countries of birth, 2010-2019
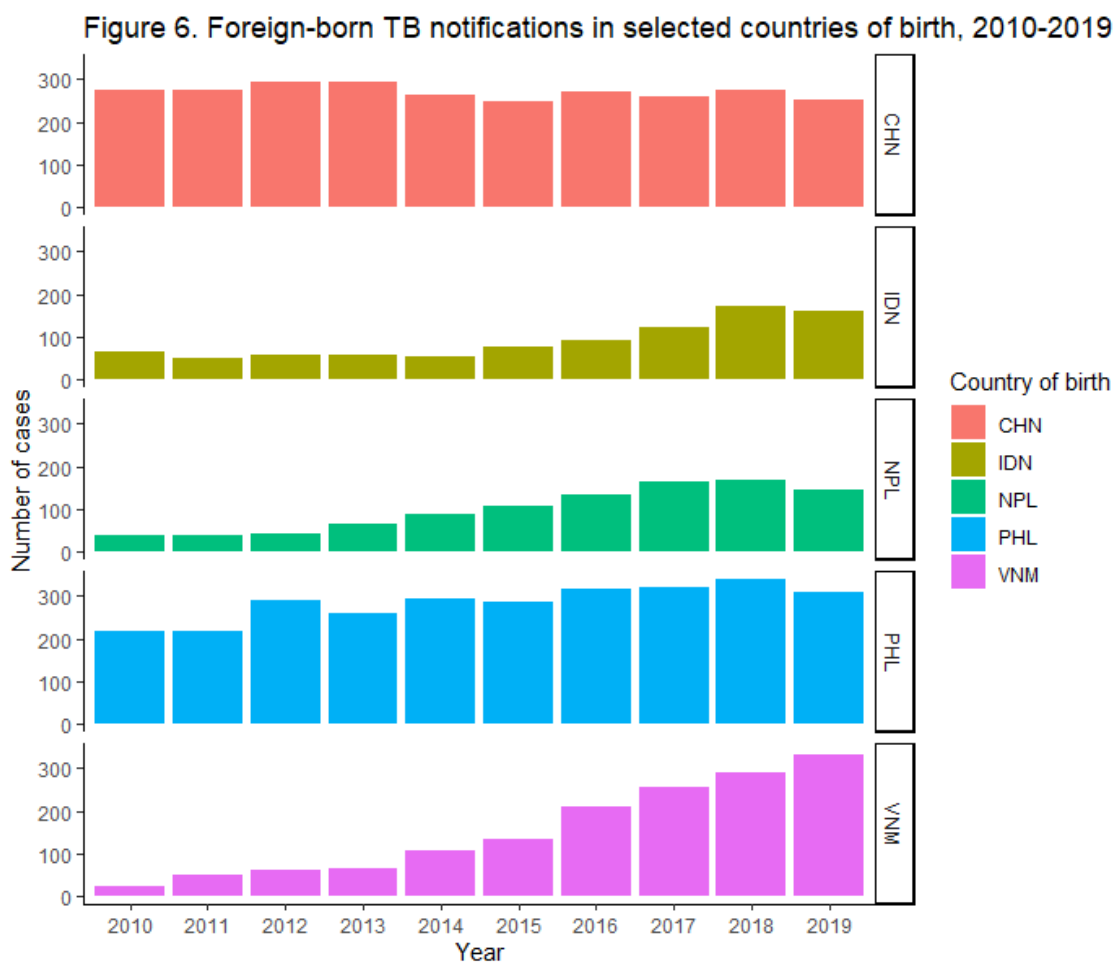
CHN= China, IDN = Indonesia, NPL= Nepal, PHL= the Philippines, VNM= Vietnam

Year of entry to Japan has been collected under the JTBS since 2012.　Of the 10,474 foreign-born cases notified in Japan between 2012 and 2019, year of entry was known for 64.9% (6,799 / 10,474). In 2019, of the 1,541 foreign-born cases notified, year of entry was known for 71.6% (1,104 / 1,541).　Of which, 48.2% (532 / 1,104) of foreign-born cases were notified within 2 years of entering Japan. (Figure 7, see also Table s12)

Fig 7. Year between entry to Japan and TB notification, 2012-2019
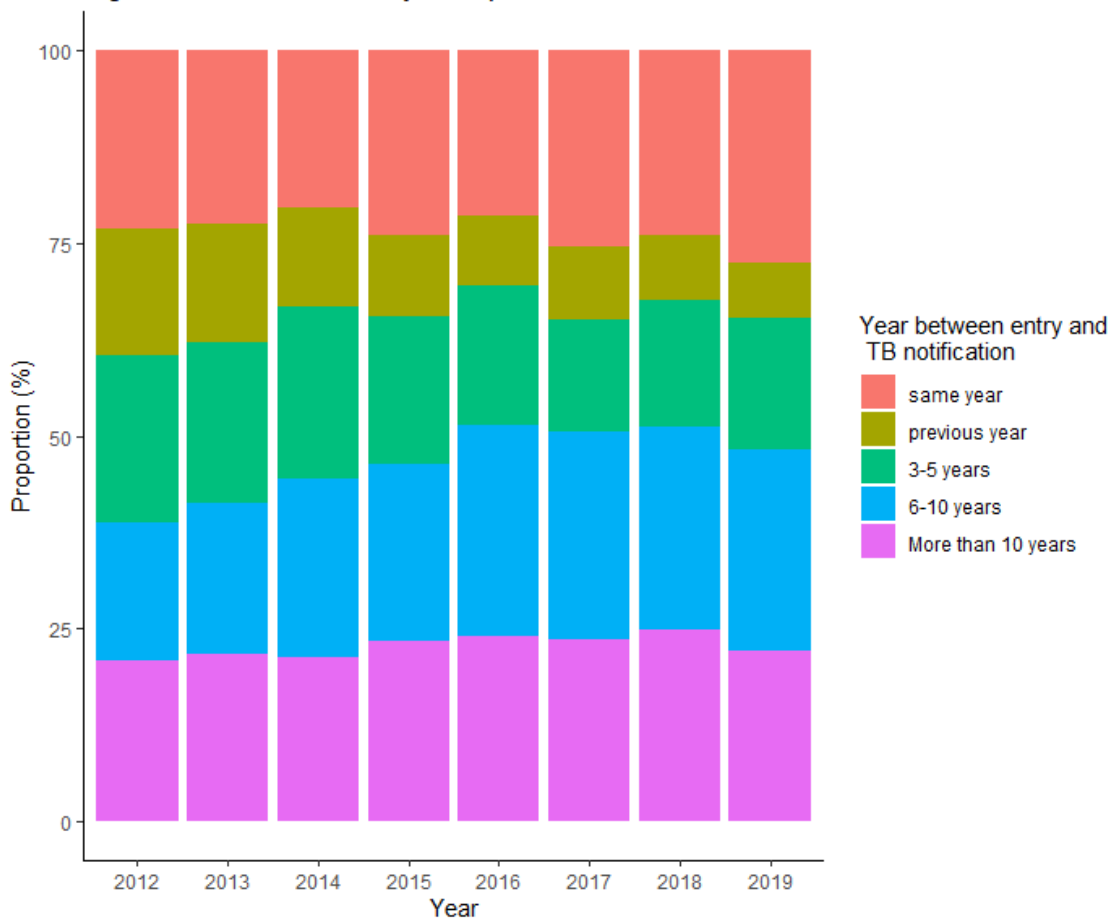
Chapter 3: Co-morbidities (HIV and Diabetes mellitus), 2012~2019

HIV/TB cases:

Table 5 summarizes the newly notified TB cases by HIV status.   In 2019, HIV test results were known only for 6.9% (1,004 / 14,460), while unknown for 93.1% of the newly notified cases.   Of those cases with known test results, 29 (2.9%) were HIV positive and 975 (97.1%) were HIV negative.

Table 5: Newly notified cases by HIV test results, 2012-2019

Notification year	HIV positive	HIV negative	HIV test not done	Unknown
2012	62	3,266	4,601	13,354
2013	50	1,890	5,090	13,465
2014	45	1,627	4,970	12,973
2015	40	1,474	4,697	12,069
2016	44	1,556	4,933	11,092
2017	34	1,454	4,753	10,548
2018	44	1,251	4,757	9,538
2019	29	975	4,942	8,514

Of the 29 HIV positive TB cases, 15 (51.7%) were foreign-born and 14 (48.3%) were Japan-born.   The proportion of women was larger among the foreign-born HIV positive TB cases (33.3%, 5 / 15) compared with the Japan-born (7.1%, 1 / 14) cases (Table 6).

Table 6: Characteristics of HIV positive TB patients, 2019 (n=29)

	Foreign-born	Japan-born	Unknown	Total
Male	10	13	0	23
Female	5	1	0	6
Total	15	14	0	29

Proportion of those who were not tested for HIV has been on a gradual increase, from 21.6% in 2012 (4,601/21,283) to 34.2% (4,942/14,460) in 2019.

Diabetes mellitus/TB cases:

Table 7 summarizes the newly notified TB cases by diabetes mellitus (DM) status. The definition of DM under the JTBS is solely dependent on the patient's self-report. In 2019, the status of DM was known for 88.4% of the newly notified cases (12,785/14,460).   Of those cases with known DM status, 2,105 had concomitant DM.   Proportion of those with DM has continued to increase steadily.

Table 7: Newly notified cases by DM status, 2012-2019

Notification year	With DM	Without DM	Unknown	Total
2012	3,036	15,978	2,269	21,283
2013	2,964	15,010	2,521	20,495
2014	2,753	14,536	2,326	19,615
2015	2,686	13,472	2,122	18,280
2016	2,509	13,277	1,839	17,625
2017	2,368	12,576	1,845	16,789
2018	2,210	11,630	1,750	15,590
2019	2,105	10,680	1,675	14,460

Of the 2,105 cases with DM, 61 (2.9%) were foreign-born, and 1,995 (94.8%) were Japan-born.   While 47.5% (29 / 61) of the foreign-born cases were aged between 35 and 54, 92.8% (1,851 / 1,995) of the Japan-born cases were aged 55 and above (Table 8).

Table 8: Characteristics of cases with DM, 2019 (n=2,105)

Age group	Foreign-born	Japan-born	Unknown
0-24	3	2	0
25-34	4	4	0
35-54	29	138	1
55+	25	1851	48
Total	61	1995	49

Chapter 4: Childhood TB, 2010-2019

In 2019, 38 cases of TB were newly notified among children aged 14 and below, with a rate per 100,000 of 0.2.　Of those cases, 52.6% were males (20 / 38) and 47.4% were females (18 / 38).　65.8% (25 / 38) had pulmonary diseases, and 34.2% (13 / 38) had extra-pulmonary disease only. Three cases of miliary TB and no case of meningeal were reported. The number of cases has steadily been declining.

In 2019, 26.3% (10 / 38) of childhood TB cases were foreign-born. The proportion of those foreign-born has been on a gradual increase (Figure 8, see also Table s13).

Figure 8. TB notification among children and proportion of foreign-born, 2010-2019
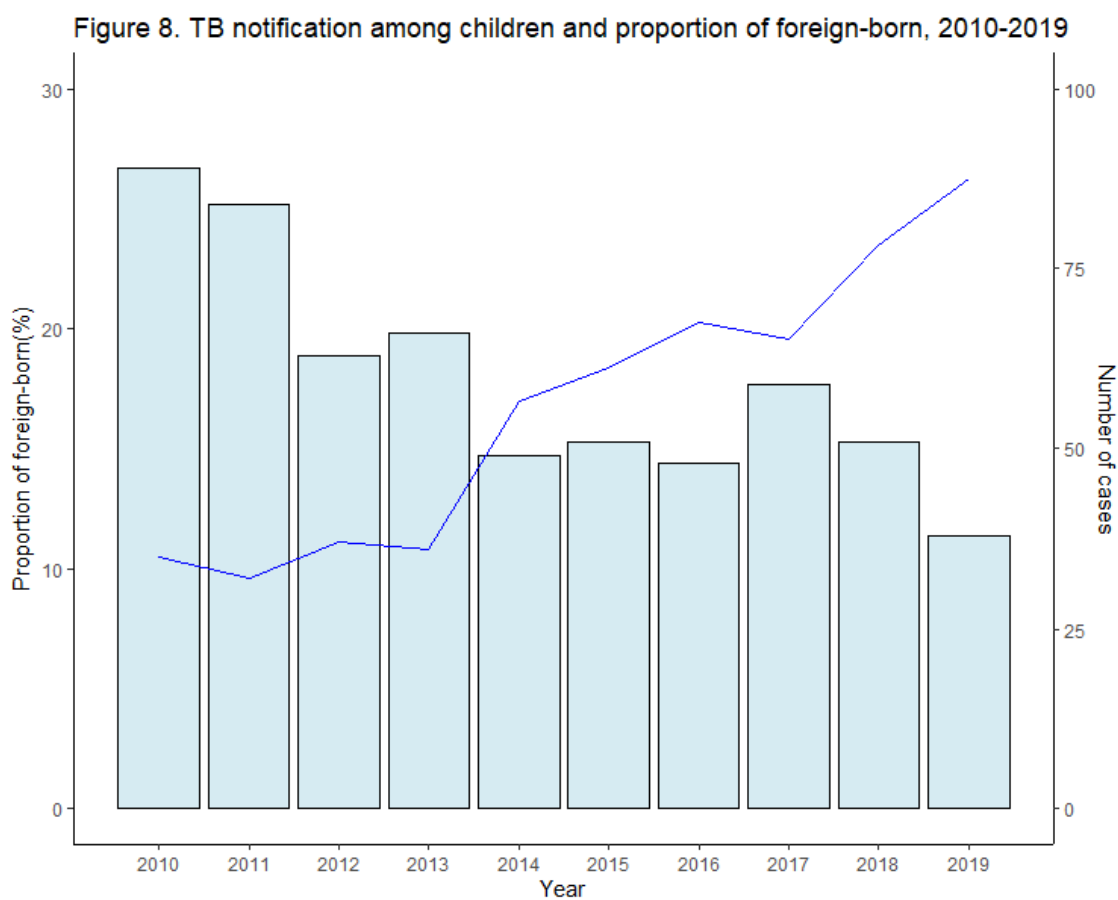
The source of infection was known for 10 of the 38 cases, 8 of whom were Japan-born.　6 were infected by their parents and 2 by their grandparents (Figure 9, see also Table s14.a).　Of the 28 Japan-born cases, 28.6% (8/28) were detected via contact investigation and 50.0% (14/28) at hospital setting, with symptoms. On the other hand, of the 10 foreign-born cases, 40.0% (4/10) were detected via contact investigation and 20.0% (2/10) at hospital setting, with symptoms (Table s14.b).

Figure 9. Source of infection of notified childhood TB, 2019
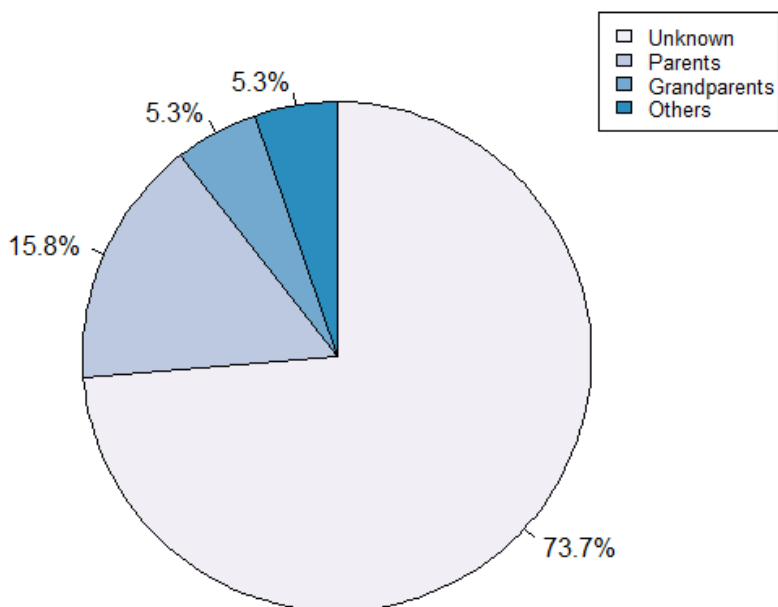
Chapter 5: Laboratory confirmation

Sputum smear status for pulmonary cases:

Of the 11,094 pulmonary TB cases notified in 2019, the results of sputum smear status were known for 99.1% (10,996/11,094).   Of these cases, 50.3% were positive (5,576/11,094). Sputum smear test was not done for 67 cases, and test results not reported for 31 cases.

Culture confirmation:

Of the 11,094 pulmonary TB cases notified in 2019, the results of culture confirmation were known for 89.9% (9,968 / 11,094).   Of these cases, 81.4% (8,110 / 9,968) were culture confirmed.   Results were pending for 846 cases, unknown for 79 cases, test was not done for 177 cases and terminated for 24 cases.   The proportion of those culture confirmed among pulmonary TB has steadily increased from 62.7% in 2010 to 73.1% in 2019 (Figure 10, see also Table s15)

Of all TB cases notified in 2019, results of culture confirmation were known for 86.9% (12,563 / 14,460). Of these cases, 74.8% (9,396 / 12,563) were culture confirmed. Results were pending for 1,224 cases, unknown for 113 cases, test was not done for 268 cases and terminated for 27 cases.

Figure 10. Proportion of culture confirmed among PTB, 2010-2019
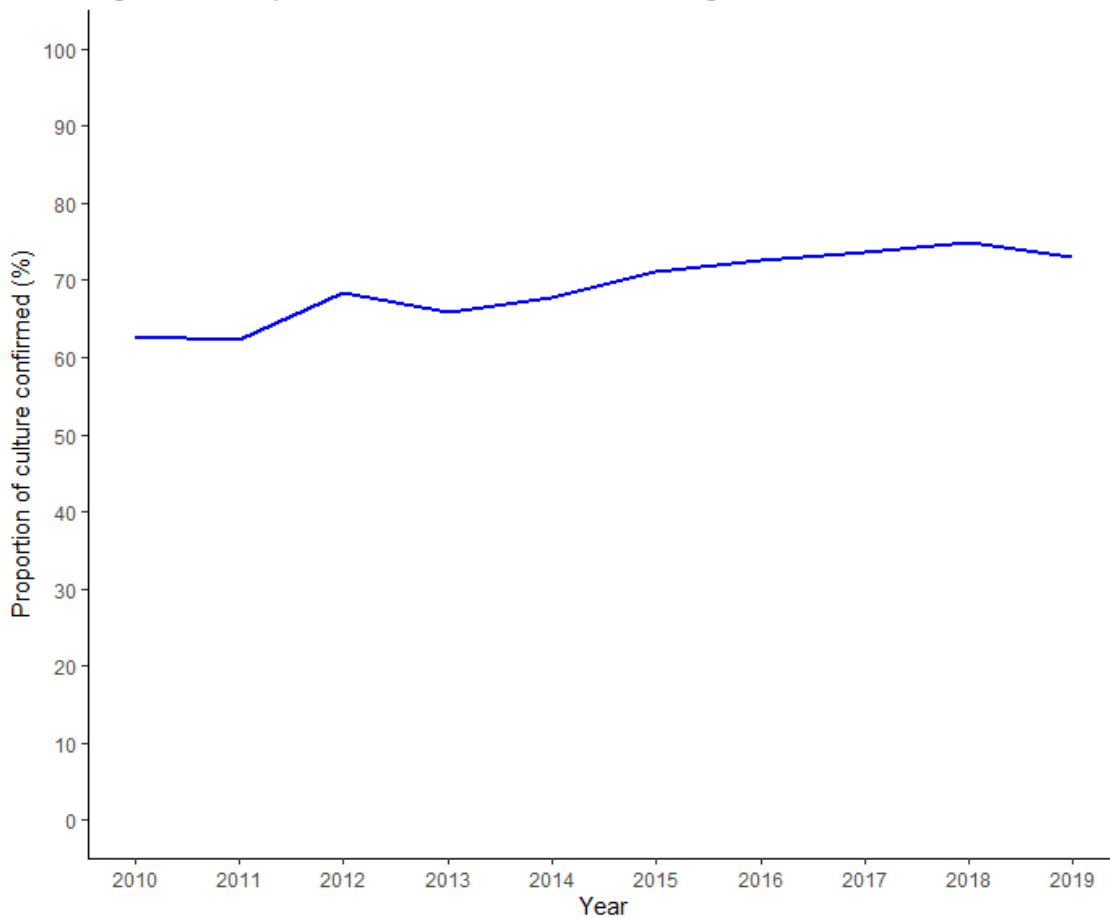
Chapter 6: Drug-resistant TB (including treatment outcomes)

Drug susceptibility test for isoniazid and rifampicin:

Of the 9,396 culture confirmed TB cases notified in 2019, drug susceptibility test (DST) results for both isoniazid (INH) and rifampicin (RFP) were known for 81.0% (7,613/ 9,396).   The proportion of those with DST results for both isoniazid and rifampicin has, despite gradually, been increasing (Figure 11, see also Table s16)

Figure 11. Proportion of DST results known of culture confirmed TB, 2012-2019
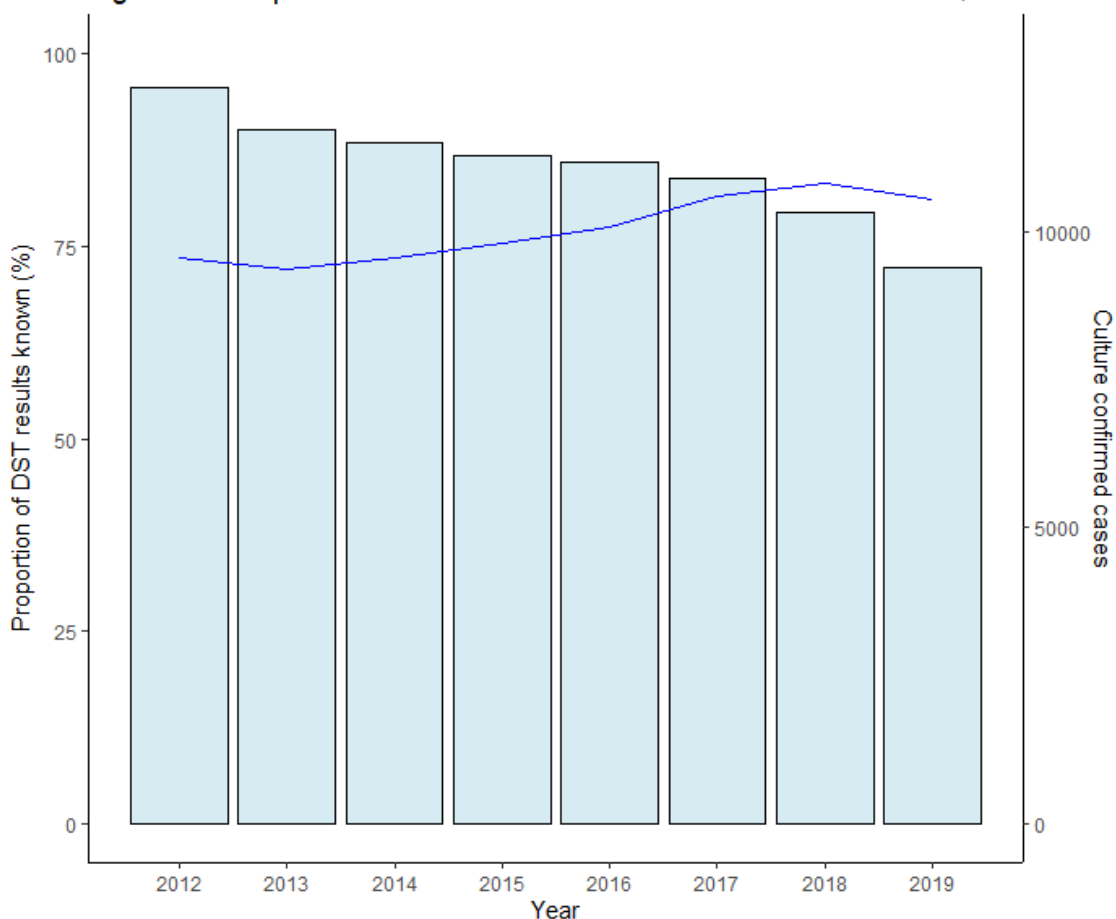
Multidrug resistant TB (MDR-TB):

Of the 7,613 cases with DST results known, 0.6% (45 / 7,613) had multi-drug resistance (MDR) with resistance to at least isoniazid and rifampicin. Out of the 45 cases, 44 were among pulmonary TB. The proportion of those with MDR resistance has remained constantly higher among the foreign-born, compared with Japan-born (2.8% vs 0.4% in 2019). (Figures 12a-12c, see also Table s17)

Figure 12a. Number and proportion of MDR resistant TB (all), 2012-2019
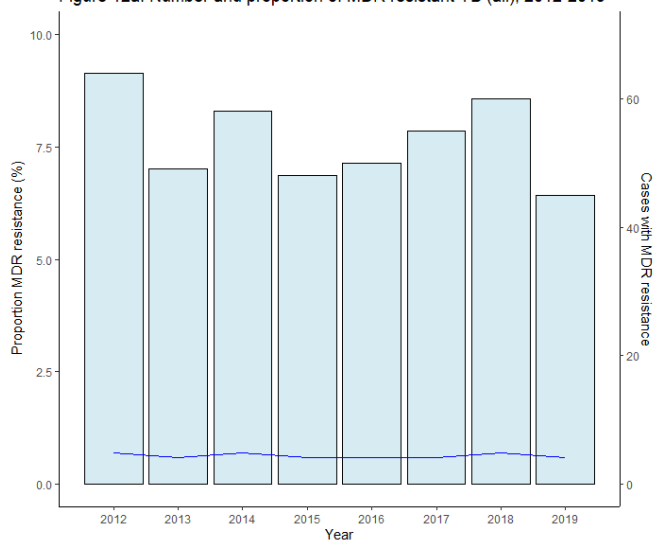
Figure 12b. Number and proportion of MDR resistant TB (foreign-born), 2012-2019
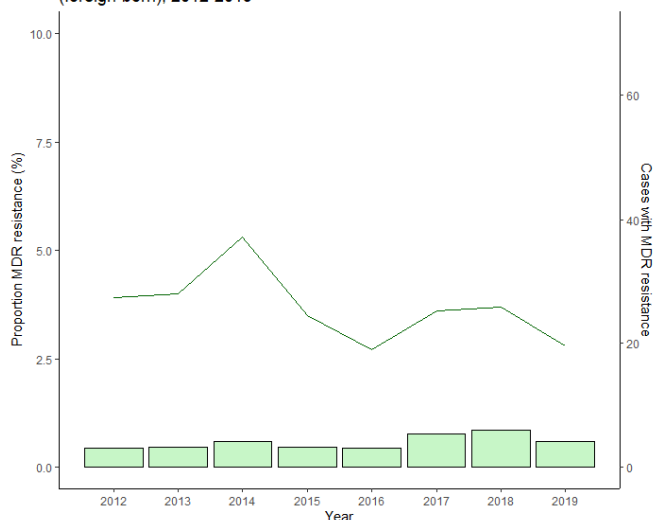
Figure 12c. Number and proportion of MDR resistant TB (Japan-born), 2012-2019
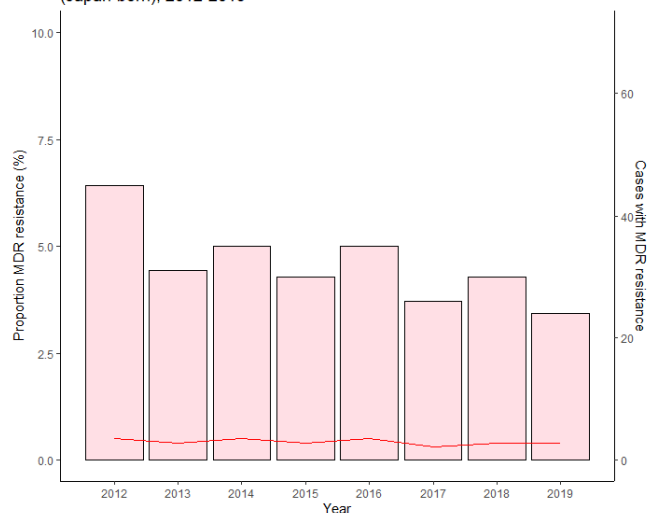
Bar = number, line = proportion, RR = rifampicin resistance, MDR = multi-drug resistance

Isoniazid resistance without MDR-TB:

Of the 7,613 cases with DST results known, 4.6% (349 /7,613) were resistant to isoniazid (INH) without MDR.   The overall number of cases with INH resistance has remained relatively constant over the past 5 years.   However, looking at the cases by country of birth, the number of INH resistant cases have increased among the foreign-born cases (Figures 13a-13c, see also Table s18).   Of the 65 foreign-born patients with INH resistance notified in 2019, 18 were from Vietnam, 13 from the Philippines and 11 from China.

Figure 13a. Number and proportion of INH resistant TB (all), 2012-2019
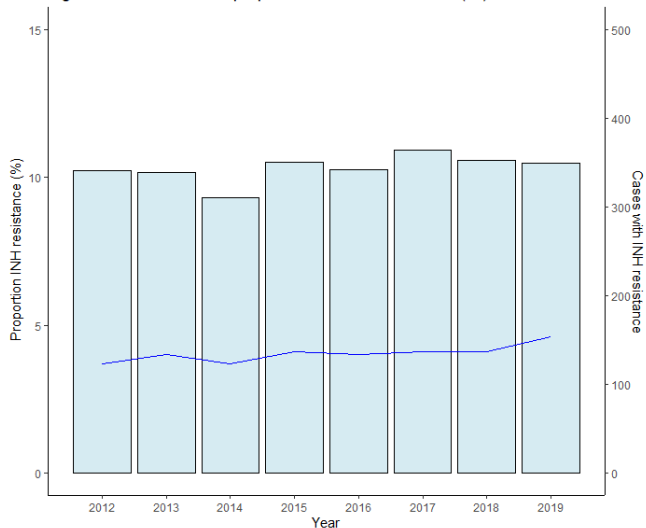
Figure 13b. Number and proportion of INH resistant TB (foreign-born), 2012-2019
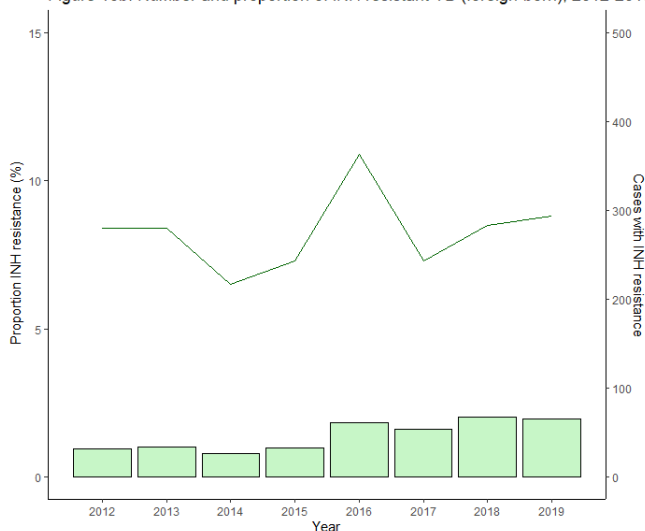
Figure 13c. Number and proportion of INH resistant TB (Japan-born), 2012-2019

Bar = number, line = proportion, INH = isoniazid

Table 9 summarizes the characteristics of those cases with MDR and INH mono-resistance notified in 2019.   The proportions of males were greater among those with MDR and INH mono-resistance.   The proportions of those aged 55 and above were the largest among all cases, reflecting the age structure of TB patients in Japan.   The proportions of foreign-born were much higher than the proportion of foreign-born among the overall TB cases (10.9% in 2019).   The proportion of retreatment was higher among those with MDR compared with those with INH mono-resistance.

Table 9. Characteristics of cases with MDR and INH mono-resistance, 2019

	MDR		INH mono-resistance	
	n	%	n	%
Sex				
Male	23	51.1	220	63.0
Female	22	48.9	129	37.0
Age group				
0-14	0	0.0	1	0.3
15-34	19	42.2	64	18.3
35-54	6	13.3	56	16.0
55+	20	44.4	228	65.3
Country of birth				
Japan-born	24	53.3	281	80.5
Foreign-born	21	46.7	65	18.6
COB unknown	0	0.0	3	0.9
Tx history				
New	35	77.8	317	90.8
Retreatment	10	22.2	28	8.0
Unknown	0	0.0	4	1.1
TOTAL	45	100.0	349	100.0

COB= country of birth, Tx=treatment

Outcomes of MDR-TB cohort:

The JTBS underwent a system revision in 2017 – one of the major changes included assessment of treatment outcomes. Prior to the revision, the JTBS only summarized the treatment outcomes of pulmonary TB, as according to the computerized algorithm. The new change now enables PHCs to enter treatment outcomes of all TB, including extrapulmonary and MDR-TB, individually. This year, the treatment outcomes of MDR-TB patients notified in 2017 are presented (i.e. treatment outcomes at the end of 48 months). (Table 10).

Table 10. Outcomes of MDR-TB cohort, notified in 2017, at the end of 2019

Tx outcomes	n	%
Cured	16	25.4
Completed	17	27.0
Died	9	14.3
Tx failed	0	0.0
LTFU	1	1.6
Transferred-out	15	23.8
Still on tx	5	7.9
Unknown	0	0.0
Total	63	100.0

Tx = treatment, LTFU = lost to follow-up

Chapter 7: Delay

Delay among symptomatic pulmonary TB:

Under the JTBS, a patient delay is defined as the time between onset of symptoms and initial doctor visit being longer than 2 months, a doctor delay as the time between initial doctor visit and diagnosis being longer than 1 month, and total delay as the time between onset of symptoms and TB diagnosis being longer than 3 months.

Of the 7,904 symptomatic pulmonary TB cases, information regarding patient delay was known for 69.1% (5,458 / 7,904), doctor delay for 91.6% (7,237 / 7,904), and total delay for 69.5% (5,491 / 7,904). Patient delay was observed in 20.4% (1,112 / 5,458), doctor delay in 21.9% (1,585 / 7,237) and total delay in 21.7% (1,191 / 5,491). (Table 11).

Table 11. Number and proportion of those with delay, 2019

Type of delay	Total no. symptomatic PTB	Information on delay known	Delay	
			n	%
Patient delay	7,904	5,458	1,112	20.4
Doctor delay	7,904	7,237	1,585	21.9
Total delay	7,904	5,491	1,191	21.7

The proportions of those with delay has gradually been increasing, with the proportion of those with doctor delay constantly being higher than patient delay (Figure 14, see also Table s19).

Figure 14. Proportions of those with delay, 2010-2019
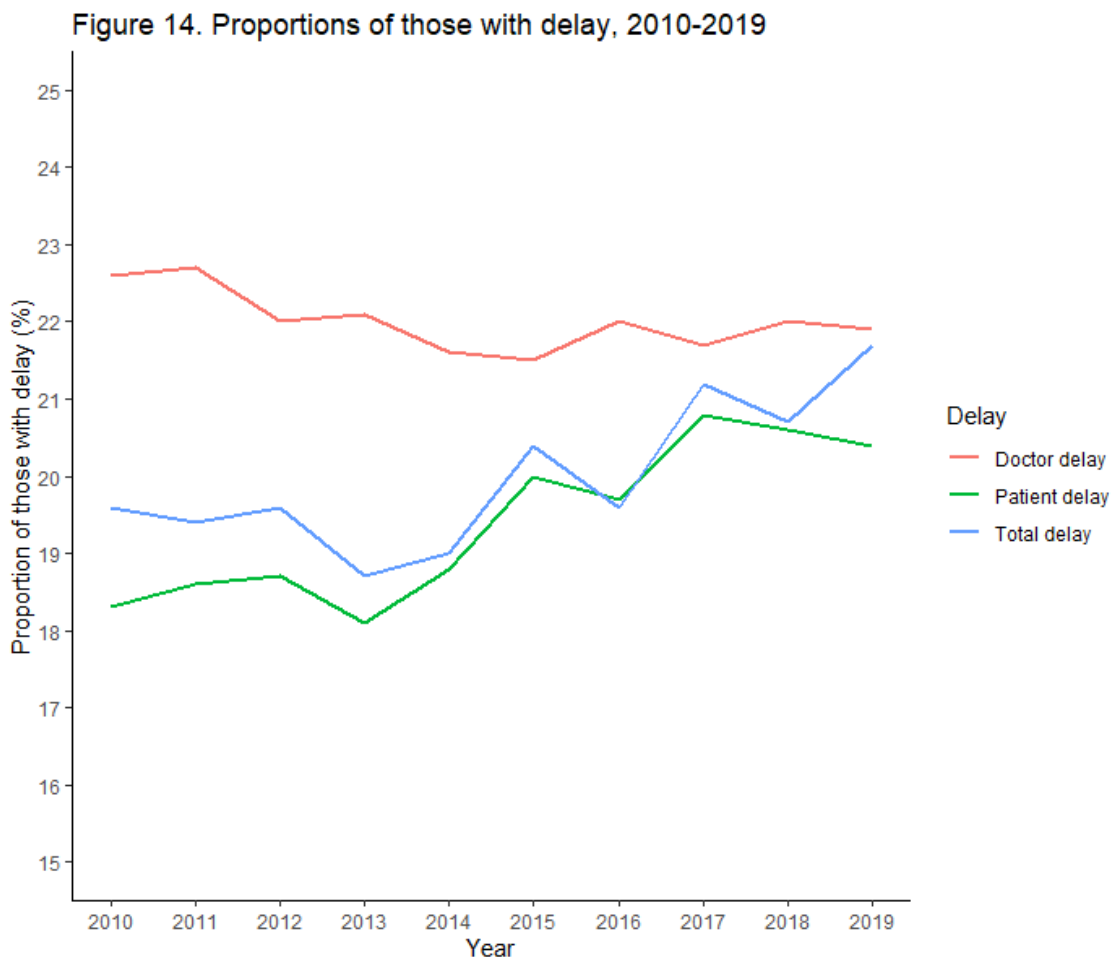
Characteristics of those with delay:

Characteristics of symptomatic PTB patients by delay type are summarized in Table 12. Proportions of those with patient delay was higher among males compared with females, while vice versa for doctor delay. As for the age groups, proportions of those with patient delay was the highest among those aged 55-64 years old, followed by those aged 15-24 years old. Proportion of patient delay was higher among the foreign-born compared with the Japan-born, and among those with social risk factors– however, it must be noted that age distribution of Japan- and foreign-born patients significantly differ. Patient delay among the

younger age groups is in fact higher among the Japan-born patients (data not shown).   Proportion of total delay was similarly high among those with social risk factors, and among those aged 45-64years old.

Table 12. Proportions of those with delay among selected characteristics, 2019

	Patient delay			Doctor delay			Total delay		
	Total	With delay	Proportion of those with delay (%)	Total	With delay	Proportion of those with delay (%)	Total	With delay	Proportion of those with delay (%)
TOTAL	5,458	1,112	20.4	7,237	1,585	21.9	5,491	1,191	21.7
Sex									
Male	3,305	698	21.1	4,411	937	21.2	3,328	733	22.0
Female	2,153	414	19.2	2,826	648	22.9	2,163	458	21.2
Age group									
0-14	4	1	25.0	7	2	28.6	4	1	25.0
15-24	209	59	28.2	289	36	12.5	209	54	25.8
25-34	291	78	26.8	391	83	21.2	291	81	27.8
35-44	291	80	27.5	371	79	21.3	291	84	28.9
45-54	369	98	26.6	497	93	18.7	371	112	30.2
55-64	410	123	30.0	543	120	22.1	413	127	30.8
65+	3,884	673	17.3	5,139	1,172	22.8	3,912	732	18.7
Country of birth									
Foreign-born	460	120	26.1	621	109	17.6	460	113	24.6
Japan-born	4,946	980	19.8	6,481	1,447	22.3	4,979	1,065	21.4
COB unknown	52	12	23.1	135	29	21.5	52	13	25.0
Social risk factor									
Homeless	64	23	35.9	88	9	10.2	64	22	34.4
Unemployed*	287	87	30.3	387	71	18.3	289	87	30.1
On social welfare	409	119	29.1	532	115	21.6	411	119	29.0
No insurance	25	11	44.0	34	0	0.0	25	9	36.0

COB = country of birth

*Unemployed among those aged between 25 and 64

Chapter 8: Treatment outcomes in the non-MDR cohort at the end of 12 months

TB outcomes in the non-MDR cohort:

In 2018, a total of 15,530 non-MDR cases were reported. Treatment outcome at the end of 12 months was available for 99.5% (15,454 / 15,530) and is summarized in Table 13.

Table 13. Treatment outcomes at 12 months for drug sensitive cases notified in 2018

Tx outcomes	n	%
Cured	3,386	21.9
Completed	6,788	43.9
Died	3,467	22.4
Failed	9	0.1
LTFU	254	1.6
Still on tx	374	2.4
Transferred-out	1,130	7.3
Not evaluated	46	0.3
Total	15,454	100.0

Tx = treatment, LTFU = lost to follow-up

As approximately two-thirds of the cases in Japan are aged 65 and above, the treatment outcomes of the younger age groups were re-analyzed. Of the 5,121 cases aged 64 and below, whose treatment outcomes at the end of 12 months were available, 81.0% (4,146 / 5,121) had either completed treatment or were cured (Table 14).

Table 14. Treatment outcomes 12 months for drug sensitive cases (aged 0-64) notified in 2018

Tx outcomes	n	%
Cured	1,362	26.6
Completed	2,784	54.4
Died	142	2.8
Failed	3	0.1
LTFU	86	1.7
Still on tx	279	5.4
Transferred-out	442	8.6
Not evaluated	23	0.4
Total	5,121	100.0

Tx = treatment, LTFU = lost to follow-up

TB outcomes for the HIV positive cohort:

Of the 43 HIV positive cases whose treatment outcomes at the end of 12 months were available, 60.5% (26 / 43) had either completed treatment or were cured (Table 15).

Table 15. Treatment outcomes at 12 months for HIV positive drug sensitive cases notified in 2018

Tx outcomes	n	%
Cured	9	20.9
Completed	17	39.5
Died	4	9.3
Failed	0	0.0
LTFU	1	2.3
Still on tx	4	9.3
Transferred-out	8	18.6
Not evaluated	0	0.0
Total	43	100.0

Tx = treatment, LTFU = lost to follow-up

Characteristics of those who have died (non-MDR cohort):

Characteristics of those who have died among the non-MDR cohort are summarized in Table 16a. 62.6% (2,170 / 3,467) were males, 95.9% (3,325 / 3,467) were aged 65 and above, and 95.9% (3,325 / 3,467) were Japan-born. Proportions with the social risk factors among those aged between 25 and 64, and who have died (n=140) were also calculated: 16.7% (10 / 60) were homeless, 58.6% (82/140) were unemployed and 22.1% (31/140) were receiving social welfare.

Table 16a. Characteristics of those who have died among the entire drug sensitive cohort in 2018

	n	%
Sex		
Male	2,170	62.6
Female	1,297	37.4
Total	3,467	100.0
Age groups		
0-14	0	0.0
15-64	142	4.1
65+	3,325	95.9
Total	3,467	100.0
Country of birth		
Japan-born	3,325	95.9
Foreign-born	32	0.9
COB unknown	110	3.2
Total	3,467	100.0
Social risk factor (aged 25-64, n=140)		
Homeless	10	**16.7**
Not Homeless	50	83.3
Total*	60	100.0
Unemployed	82	58.6
Employed, students & Unknown	58	41.4
Total	140	100.0
On social welfare	31	22.1
No insurance	11	7.9
With health insurance & Unknown	98	70.0
Total	140	100.0

*Note: total of homeless excludes those whose information on the state of homelessness is unknown or unavailable, i.e. total n=60
COB = country of birth

Proportions of those who have died (non-MDR cohort):

Proportions of those who have died by selected characteristics are summarized in Table 16b. It was slightly higher among males than females (23.6% vs 20.7%). By age groups, it was the highest among those aged 65 years old and above (32.2%), and by country of birth, highest among those whose country of birth was unknown (32.8%). The proportion of those who have died among homeless people and those without insurance was also high (16.1%, 23.4%).

Table 16b. Proportions of those who have died among the entire drug sensitive cohort in 2018

	No. patients	Of which died	% of those who have died
Sex			
Male	9,181	2,170	23.6
Female	6,273	1,297	20.7
Age groups			
0-14	52	0	0.0
15-64	5,069	142	2.8
65+	10,333	3,325	32.2
Country of birth			
Japan-born	13,484	3,325	24.7
Foreign-born	1,635	32	2.0
COB* unknown	335	110	32.8
Social risk factor aged 25-64			
Homeless	62	10	16.1
Unemployed	751	82	10.9
On social welfare	236	31	13.1
No insurance	47	11	23.4

COB = country of birth

Characteristics of those who were lost to follow-up (non-MDR cohort):

Characteristics of those who were lost to follow-up among the entire drug sensitive cohort are summarized in Table 17a.   58.3% (148 / 254) were males, 66.1% (168/ 254) were aged 65 and above, and 90.2% (229 / 254) were Japan-born. Proportions with the social risk factors among those aged between 25 and 64, and who were LTFU (n=72 were also calculated: 2.5% (1 / 40) were homeless, 19.4% were unemployed (14 / 72, and 8.3% (6 / 72) were receiving social welfare.

Table 17a. Characteristics of those lost to follow-up among the entire drug sensitive cohort in 2018

	n	%
Sex		
Male	148	58.3
Female	106	41.7
Total	254	100.0
Age groups		
0-14	0	0.0
15-64	86	33.9
65+	168	66.1
Total	254	100.0
Country of birth		
Japan-born	229	90.2
Foreign-born	20	7.9
COB unknown	5	2.0
Total	254	100.0
Social risk factor (aged 25-64, n=72		
Homeless*	1	2.5
Not Homeless	39	97.5
Total	40	100.0
Unemployed	14	19.4
Employed, students & Unknown	58	80.6
Total	72	100.0
On social welfare	6	8.3
No insurance	1	1.4
With health insurance & Unknown	65	90.3
Total	72	100.0

*Note: total of homeless excludes those whose information on the state of homelessness is unknown, i.e. total n=54
COB = country of birth

Proportions of those who were lost to follow-up (non-MDR cohort):

Proportions of those who were lost to follow-up by selected characteristics are summarized in Table 17b. It was not significantly different by sex, age groups, and by country of birth, it was particularly high among those on social welfare (2.5%), and those who no insurance (2.1%).

Table 17b. Proportions of those lost to follow-up among the entire drug sensitive cohort in 2018

	No. patients	Of which LTFU	% of those LTFU
Sex			
Male	9,181	148	1.6
Female	6,273	106	1.7
Age groups			
0-14	52	0	0.0
15-64	5,069	86	1.7
65+	10,333	168	1.6
Country of birth			
Japan-born	13,484	229	1.7
Foreign-born	1,635	20	1.2
COB* unknown	335	5	1.5
Social risk factor aged 25-64			
Homeless	62	1	1.6
Unemployed	751	14	1.9
On social welfare	236	6	2.5
No insurance	47	1	2.1

COB = country of birth

Chapter 9: Latent tuberculosis Infection

Notification of latent tuberculosis infection (LTBI) has been mandatory since 2006. In 2019, 7,684 cases of LTBI were newly notified. The number of new cases has reached a peak in 2011 and decreased over the next two years.   However, it has remained relatively stable since 2013. On the other hand, proportion of foreign-born among the total LTBI cases notified has been increasing, notably from 2011 (Figure 15, see also Table s20).

Figure 15. LTBI notification, 2010-2019
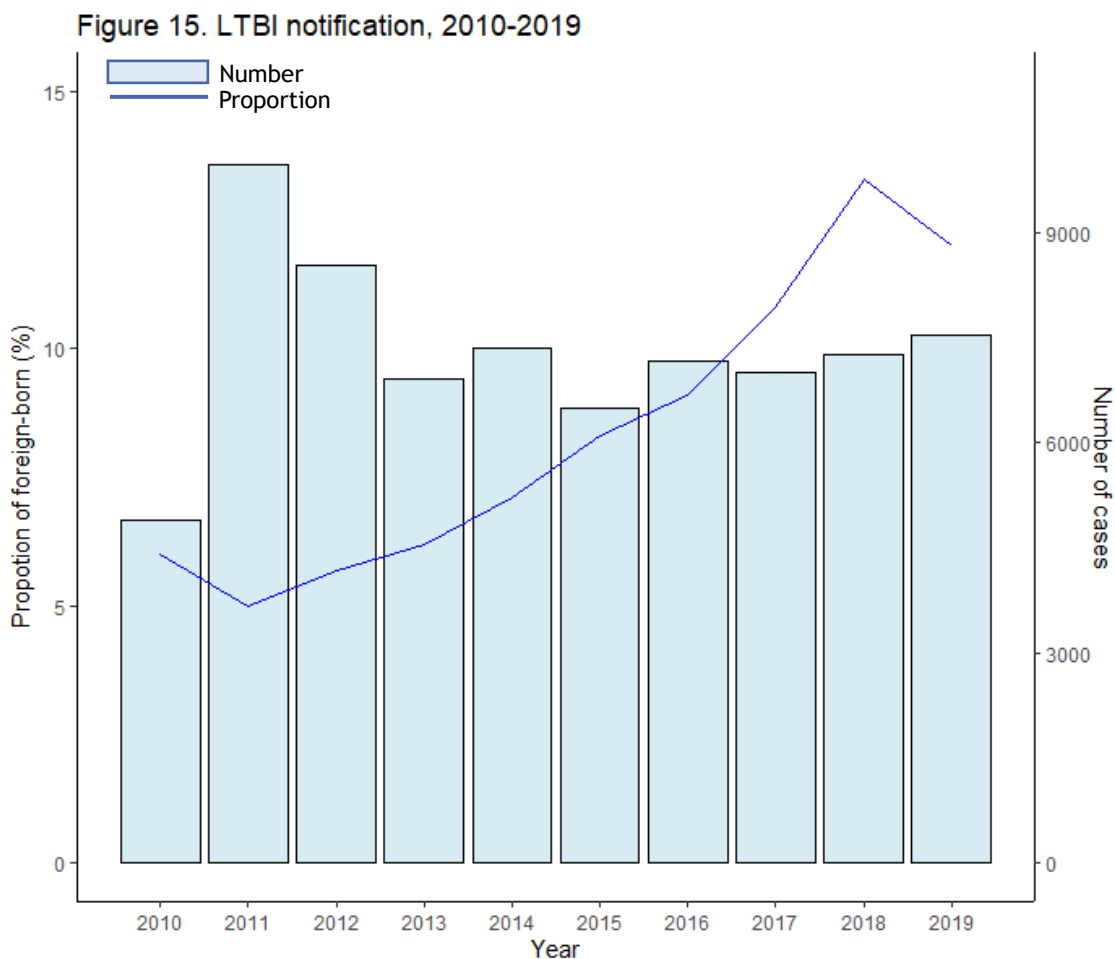
Table 18 summarizes the LTBI case notifications by sex and age groups. Breaking down the cases by age groups, the largest number of cases were diagnosed among those aged 65-74 (1,302 cases), followed by those aged 45-54 (1,151 cases). More LTBI is notified among female, especially among those aged 25-54.

Table 18. LTBI notification by age and sex, 2019

Age groups	Total		Male		Female	
	n	%	n	%	n	%
0-4	411	5.3	181	4.9	230	5.8
5-14	115	1.5	55	1.5	60	1.5
15-24	573	7.5	293	7.9	280	7.0
25-34	760	9.9	333	9.0	427	10.7
35-44	897	11.7	382	10.3	515	12.9
45-54	1151	15.0	474	12.8	677	17.0
55-64	1034	13.5	499	13.5	535	13.5
65-74	1302	16.9	727	19.6	575	14.5
75-84	1076	14.0	583	15.7	493	12.4
85+	365	4.8	180	4.9	185	4.7
TOTAL	7,684	100	3,707	100	3,977	100.0

Mode of detecting LTBI:

While 57.5% (4,422 / 7,684) of the notified LTBI cases were detected upon contact investigation (Figure 16, see also Table s21), its proportion out of the total cases has been declining. On the other hand, the proportion of those detected at hospital settings (i.e. during medical check-up for other diseases) has been increasing. (Figure 17a & 17b, see also Table s22).

Figure 16. Mode of detection of notified LTBI, 2019

Legend:
- Contact investigation
- At other hospital setting
- With TB symptoms
- Regular screening*
- Others
- Individual health check
- Other mass investigation

57.5%
21.3%
8.8%
6.8%
3.1%
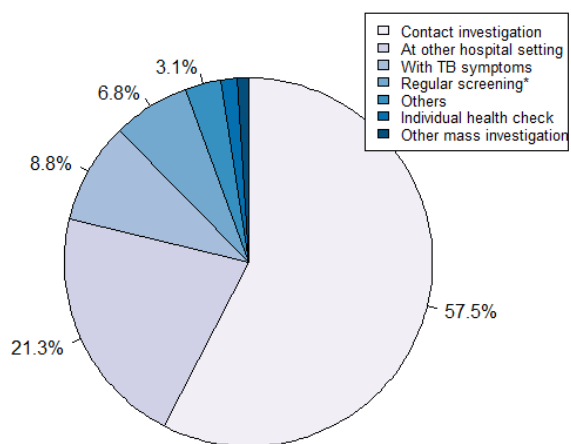
Figure 17a. Mode of detection of notified LTBI, 2007-2019

Mode of detection
— Contact investigation
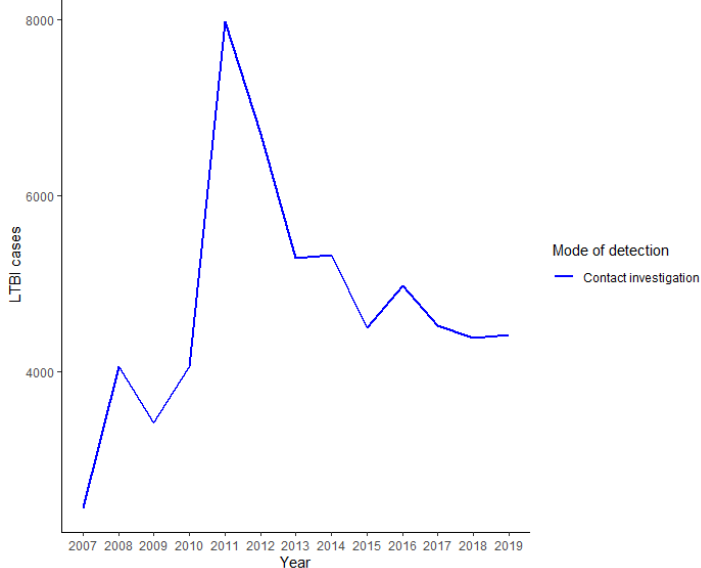
Figure 17b. Mode of detection of notified LTBI, 2007-2019

Mode of detection
— At other hospital setting
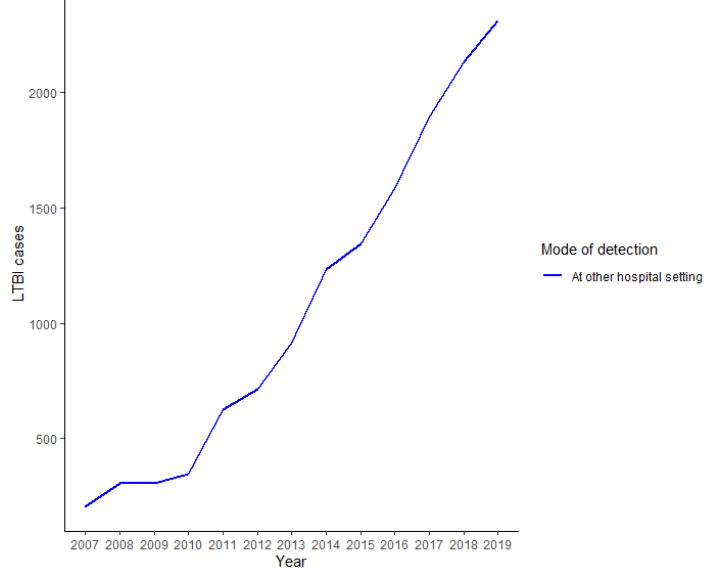
Outcome of LTBI treatment (2018 cohort):

As mentioned earlier, the JTBS has undergone a system revision and treatment outcome for 2018 cohort is now available for all TB and LTBI.

In 2018, 7,414 LTBI cases were newly notified, of which treatment outcome was available for 99.9% (7,406 /7,414).   Of the 7,406 cases, 98.4% (7,286 /7,406) had started treatment. Upon notification, 7,038 had initiated the treatment with isoniazid monotherapy.   Treatment outcomes of the 7,286 cases are summarized in Table 19.

Table 19. Outcomes at 12 months of LTBI cases notified in 2018

Tx outcomes	n	%
Completed	6,112	83.9
Died	162	2.2
Tx failed	14	0.2
LTFU	515	7.1
Transferred-out	131	1.8
Still on tx	328	4.5
Unknown	24	0.3
Total	7,286	100.0

Tx = treatment

Appendix I: Notes on TB surveillance system in Japan

Both TB and LTBI (those diagnosed as being infected but not with active TB, and who were judged as requiring preventive therapy) are notifiable diseases under the Infectious Diseases Control Law.   All physicians who diagnose TB or LTBI are requested to report to the local public health centers as soon as it is possible.

Local public health centers (PHCs), which are local government authorities responsible for public health in Japan, are responsible for compiling the reports and reporting to the Ministry of Health, Labour and Welfare of Japan.

Japan introduced the first nationwide computerized TB surveillance system, the Japan Tuberculosis Surveillance (JTBS) in 1987. The data, once entered into JTBS, is updated every month, and major findings are published annually, and also made available on-line, in Japanese. Treatment outcome is reported for the cohort notified in the previous year.

Simplified flowchart of TB

Data cleaning and analyses at national level, Dissemination and publication of analysis results

National Institute of Infectious Diseases/ Tuberculosis Surveillance Center, RIT

Ministry of Health, Labor and Welfare

Web-based central database

Prefectural and municipal Institutes of Public Health (78, as of 2019)

Data cleaning and analyses at prefectural, municipal level

Online reporting

Public Health Centers (480, as of 2019)

Notification

Medial institutions (public and private)

Appendix II: Methods

Notification rates:

Notification rate per 100,000 is calculated using the population estimates from the annual "Current Population Estimates" as of October 1st each year (Statistics Bureau, Ministry of Internal Affairs and Communications, Japan), unless in the year of population census. The population census is conducted every five year, and in the year of census the notification rates are calculated using the data from the census.

Notification rate among the foreign-born was calculated using the population estimates of foreign residents from the "Foreign residents' statistics" at the end of each year (Immigration Bureau, Ministry of Justice, Japan).

Terms of definitions and reporting years:

The overall trend is analyzed from 2010, unless otherwise noted as below:

Country of birth

Information regarding nationality (either "Japanese" or "non-Japanese") was added to JTBS in 1998, and country name and the year of entry (either "within five years", or "more than five years" or "unknown") in 2007. In 2012, the category of nationality was changed to country of birth (either "Japan-born", "foreign-born" or "unknown"), and the year of entry to the exact year of entry to Japan. In this report, the trend since 2007 is analyzed, however, the "foreign-born" includes those classified as "non-Japanese" prior to 2007. As for the time between entry to Japan and TB notification, trend since 2012 is analyzed.

Occupation

Service industry refers to those whose work involves face-to-face interactions with an unspecified large number of customers.

Other healthcare workers include co-medical workers, including care workers of elderly institutions.

Teachers include teachers of nursery and kindergarten school, primary, secondary, high-schools and universities, as well as of private classes and schools of non-compulsory education.

Full-and part-time employed refers to those with stable income other than service industry, healthcare workers, and teachers, and, and is differentiated from temporary employed (including day laborers) whose income is irregular.

Houseworkers refer to housewives and househusbands, and not paid workers e.g. maids.

Unemployed include all those without regular and/or irregular job, including the elderly who has retired.

HIV/DM

Information regarding HIV co-infection and DM was added to JTBS in 2007. HIV and DM data are self-reported, and are not matched with other database in any way. Information regarding HIV had been entered as "HIV positive", "HIV negative" and "unknown" until 2011. Since 2012, a new category of "HIV test not done" was added. Information regarding DM is entered as "with DM", "without DM" and "unknown". Both for HIV and DM, the trend since 2012 is analyzed.

Mode of detection

Regular screening refers to mandatory screening conducted at schools, workplaces and other institutions including social welfare institutions and prison institutions.

Other mass investigation refers to mass screening programs organized by local authorities, targeting specific high-risk population groups such as homeless and foreign-born students.

At hospital setting refers to a case whereby he or she is diagnosed while seeking medical attention for TB symptoms, for diseases other than TB, or during medical examination while being hospitalized for diseases other than TB.

During follow-up for TB refers to a case whereby he or she is diagnosed during the two-year follow-up after competing treatment for TB/LTBI.

Treatment outcomes of drug susceptible TB
The definitions of the treatment outcomes for active TB are in line with latest definitions of the WHO. Due to the system restructuring of JTBS as mentioned earlier, the treatment outcomes for the 2019 cohort are evaluated differently from the cohort from the previous years.   The outcomes are not directly comparable, and thus the trends are not analyzed.

LTBI
Information regarding LTBI was added to JTBS in 2006.   However, due to questionable accuracy of the data reported in 2006, trend since 2007 is analyzed.

Treatment outcomes of LTBI
Completed treatment: An LTBI patient who has undergone treatment of sufficient duration as recommended by the Japanese guideline of LTBI treatment (i.e. 6 or 9 months of INH, or 4 or 6 months of RFP)

Died: An LTBI patient who has died from any cause during treatment.

Lost to follow-up: An LTBI patient whose treatment was interrupted and not restarted.

Transferred out: An LTBI patient who has moved out of the catchment area of a public health center during treatment, and whose final treatment outcome could not be identified by the public health center.

Still on treatment: An LTBI patient who is still on treatment at month 12.

Not evaluated: An LTBI patient who patient whose treatment outcome could not be evaluated by the public health center.

Appendix III: Data quality

Data quality is ensured via the system's automatic verification program, as well as regular meetings at local levels attended by staffs from hospitals and PHCs. Periodic refresher trainings on data entry are also provided to PHC nurses as well as administrative staff across the nation.

Data capture rate for selected variables is summarized in Table iii.a.   The capture rate was defined and calculated for each variable as follows:

Country of birth: $\dfrac{\text{All active TB – country of birth unknown}}{\text{All active TB}} \times 100$

Occupation $\dfrac{\text{All active TB – occupation unknown}}{\text{All active TB}} \times 100$

Homelessness: $\dfrac{\text{All active TB – (homeless unknown+ no data entered)}}{\text{All active TB}} \times 100$

Treatment history: $\dfrac{\text{All active TB – treatment history unknown}}{\text{All active TB}} \times 100$

Previous treatment regimen: $\dfrac{\text{All active retreatment TB – regimen unknown}}{\text{All active retreatment TB}} \times 100$

Total delay: $\dfrac{\text{All symptomatic PTB – delay unknown}}{\text{All symptomatic PTB}} \times 100$

DM: $\dfrac{\text{All active TB – DM unknown}}{\text{All active TB}} \times 100$

HIV status: $\dfrac{\text{(HIV positive + HIV negative)}}{\text{All active TB}} \times 100$

HIV testing status: $\dfrac{\text{(HIV positive + HIV negative+ test not done)}}{\text{All active TB}} \times 100$

Culture known TB: $\dfrac{\text{(Culture positive+ Culture negative)}}{\text{All active TB}} \times 100$

Culture known PTB: $\dfrac{\text{(Culture positive+ Culture negative)}}{\text{All active PTB}} \times 100$

DST known TB $\dfrac{\text{(INH negative + positive) + (RFP negative + positive)}}{\text{All culture positive TB}} \times 100$

DST known PTB $\dfrac{\text{(INH negative + positive) + (RFP negative + positive)}}{\text{All culture positive PTB}} \times 100$

The denominators are summarized in Table iii.b.

Table iii.a
Data capture rate, 2019

Prefecture	Country of birth	Occupation	Homeless-ness	Treatment history	Previous treatment regimen	Total delay
1	95.9	98.5	22.9	99.2	53.8	85.2
2	97.3	97.3	25.9	100.0	75.0	83.6
3	100.0	98.8	55.4	100.0	100.0	55.8
4	99.4	97.6	68.5	97.0	80.0	55.2
5	100.0	100.0	40.9	98.5	100.0	48.5
6	100.0	98.8	78.3	96.4	50.0	39.2
7	100.0	99.2	66.4	100.0	50.0	53.3
8	99.7	97.0	41.8	98.3	40.0	42.4
9	100.0	100.0	23.4	98.4	60.0	89.3
10	99.4	99.4	62.8	98.1	85.7	93.8
11	95.0	93.3	54.5	97.5	65.6	38.3
12	100.0	98.7	65.4	99.1	75.0	70.7
13	99.4	98.3	66.4	98.3	60.5	73.9
14	94.9	97.5	33.8	97.9	79.6	45.7
15	99.5	99.5	56.8	98.4	76.9	90.7
16	95.0	97.0	38.6	98.0	50.0	39.6
17	100.0	100.0	56.0	100.0	83.3	97.0
18	97.1	100.0	87.0	98.6	50.0	89.3
19	98.7	98.7	75.3	96.1	60.0	58.8
20	98.1	99.4	44.9	97.4	100.0	73.8
21	99.7	100.0	75.2	100.0	45.5	65.6
22	99.7	99.2	45.1	99.4	81.8	67.7
23	100.0	98.7	88.8	99.2	76.3	83.4
24	99.4	100.0	32.9	98.8	100.0	71.6
25	99.3	98.7	14.1	100.0	66.7	15.7
26	99.2	98.6	65.8	99.4	81.8	75.0
27	99.3	98.5	44.2	98.8	82.4	93.9
28	91.9	98.8	35.8	99.0	78.9	56.1
29	99.5	98.9	77.4	97.8	38.5	81.7
30	100.0	100.0	56.4	100.0	100.0	95.9
31	100.0	100.0	37.2	100.0	NA	12.0
32	92.6	100.0	37.0	100.0	NA	39.4
33	99.5	99.5	24.2	98.9	75.0	84.9
34	95.4	95.8	36.6	97.9	75.0	40.4
35	97.4	99.4	39.0	98.1	75.0	76.6
36	97.9	99.0	28.1	99.0	100.0	69.6
37	100.0	98.0	58.6	98.0	75.0	80.0
38	97.3	98.2	57.1	99.1	60.0	83.6
39	96.1	98.7	24.7	100.0	60.0	59.1
40	99.0	98.4	31.3	98.7	77.3	70.8
41	100.0	100.0	15.7	98.1	100.0	64.3
42	91.4	100.0	43.1	100.0	73.3	73.5
43	52.6	97.7	18.9	99.4	60.0	32.5
44	98.7	97.4	66.2	99.3	100.0	97.7
45	100.0	99.0	53.5	100.0	81.8	84.3
46	99.5	99.5	54.1	100.0	66.7	60.4
47	100.0	100.0	85.2	99.4	75.0	59.5
Total	97.6	98.3	51.6	98.7	72.0	69.5

(cont.)

Prefecture	DM	HIV status	HIV testing status	Culture known TB	Culture known PTB	DST known TB	DST known PTB
1	79.2	4.4	54.2	82.0	89.6	37.6	38.4
2	75.0	1.8	67.9	82.1	86.2	71.9	73.0
3	92.8	0.0	61.4	79.5	84.5	61.2	64.3
4	95.2	1.2	40.5	93.5	95.5	89.7	91.7
5	68.2	0.0	18.2	89.4	87.8	69.4	71.8
6	91.6	2.4	39.8	95.2	97.1	63.3	64.8
7	87.5	0.0	46.9	78.9	76.8	68.6	71.4
8	79.9	2.7	51.8	78.3	81.9	61.0	61.8
9	92.6	12.8	34.6	95.2	96.0	93.8	94.7
10	87.8	2.6	51.9	97.4	99.1	85.0	89.8
11	79.6	5.5	29.9	77.1	79.1	68.3	69.1
12	90.7	1.3	34.9	90.4	93.3	86.3	86.8
13	90.9	40.9	57.9	94.6	97.1	94.5	96.2
14	75.8	0.7	22.9	78.9	81.3	69.7	68.7
15	82.1	2.1	74.2	78.9	86.5	64.0	64.2
16	86.1	2.0	36.6	93.1	93.8	79.7	86.0
17	89.0	0.0	44.0	98.0	100.0	93.9	94.6
18	95.7	0.0	1.4	95.7	97.9	77.8	82.9
19	81.8	1.3	66.2	88.3	89.7	67.3	66.0
20	82.1	5.1	25.0	82.1	88.0	71.7	72.0
21	88.6	1.7	47.2	83.1	84.5	75.1	76.4
22	85.4	0.6	10.1	80.7	83.8	60.4	60.9
23	92.9	4.1	42.2	97.9	99.4	95.3	96.5
24	89.8	4.2	24.0	80.2	83.7	55.4	55.1
25	96.6	0.7	27.5	41.6	40.7	43.6	50.0
26	91.2	0.0	37.3	89.5	89.9	81.4	85.5
27	93.8	1.3	53.4	94.8	96.3	95.2	96.2
28	89.7	1.8	32.4	93.9	98.0	83.3	82.8
29	97.3	2.7	39.8	97.8	98.1	96.2	95.9
30	100.0	0.9	89.7	97.4	100.0	100.0	100.0
31	97.7	0.0	51.2	51.2	50.0	31.6	35.3
32	90.7	1.9	5.6	79.6	75.6	79.4	78.6
33	94.1	1.6	41.4	88.7	89.9	72.4	75.0
34	81.7	2.8	36.6	77.1	85.6	69.1	70.1
35	89.6	1.9	26.0	74.7	77.6	69.9	70.9
36	89.6	0.0	28.1	89.6	89.1	50.8	51.0
37	82.8	0.0	19.2	94.9	95.0	76.6	80.9
38	86.6	1.8	52.7	81.3	89.5	52.7	57.1
39	88.3	0.0	11.7	76.6	84.3	56.8	55.9
40	89.6	0.5	13.5	78.7	83.1	84.6	84.9
41	68.5	0.0	14.8	69.4	68.0	63.6	70.8
42	97.7	0.0	39.1	67.8	71.2	59.5	63.9
43	90.3	2.3	66.3	44.6	57.3	47.8	43.6
44	96.7	2.6	91.4	100.0	100.0	93.4	94.9
45	86.1	3.0	52.5	92.1	100.0	86.2	91.1
46	95.6	0.0	19.7	80.9	88.6	70.0	69.9
47	97.7	1.1	50.6	90.3	91.9	85.3	85.4
Total	88.4	6.9	41.1	86.9	89.9	81.0	82.1

Table iii.b
Denominators used to calculate the capture rate, 2019

Prefecture	Active TB	Total PTB	Active TB, retreatment cases	Symptomatic PTB	Culture positive PTB	Culture positive TB
1	389	288	13	229	198	226
2	112	87	8	67	63	64
3	83	58	2	43	42	49
4	168	132	5	96	96	117
5	66	49	2	33	39	49
6	83	68	2	51	54	60
7	128	95	4	60	56	70
8	299	227	15	172	152	172
9	188	149	5	112	113	130
10	156	111	7	96	98	120
11	786	617	32	446	405	464
12	697	556	44	379	418	468
13	1,810	1,430	86	936	1,125	1,297
14	987	788	49	532	533	603
15	190	148	13	97	106	114
16	101	65	4	48	50	69
17	100	81	6	66	74	82
18	69	48	4	28	35	45
19	77	58	5	51	47	52
20	156	108	5	80	75	92
21	290	233	11	160	148	169
22	357	272	11	192	197	227
23	1,024	786	59	542	649	763
24	167	129	5	95	89	101
25	149	113	9	70	32	39
26	354	248	11	180	193	237
27	1,619	1,315	68	952	1,031	1,176
28	765	591	38	481	478	552
29	186	154	13	115	121	131
30	117	93	3	74	75	88
31	43	34	0	25	17	19
32	54	41	0	33	28	34
33	186	149	4	106	104	116
34	284	209	20	141	144	162
35	154	116	8	77	79	93
36	96	64	1	56	51	63
37	99	60	4	45	47	64
38	112	86	5	61	63	74
39	77	51	5	44	34	37
40	614	443	22	295	278	338
41	108	75	2	56	48	66
42	174	118	15	83	61	79
43	175	110	5	77	55	67
44	151	116	6	86	78	91
45	101	69	11	51	56	65
46	183	132	12	106	93	100
47	176	124	8	79	82	102
Total	14,460	11,094	667	7,904	8,110	9,396

Appendix IV: Supplementary tables

Table s1. Number and rate of all active TB notifications, 2010-2019

Notification year	No.cases	Percentage change in cases	Notification rate per 100,000	Percentage change in rate
2010	23,261	NA	18.2	NA
2011	22,681	2.5	17.7	2.8
2012	21,283	6.2	16.7	5.7
2013	20,495	3.7	16.1	3.6
2014	19,615	4.3	15.4	4.4
2015	18,280	6.8	14.4	6.5
2016	17,625	3.6	13.9	3.5
2017	16,789	4.7	13.3	4.3
2018	15,590	7.1	12.3	7.5
2019	14,460	7.2	11.5	6.5

Table s2. Number of TB notifications by age group and sex, 2019

Age group	Total			Male			Female		
	n	population	rate per 100,000	n	population	rate per 100,000	n	population	rate per 100,000
0-4	18	4,758,372	0.4	5	2,437,923	0.2	13	2,320,449	0.6
5-9	9	5,101,143	0.2	7	2,611,719	0.3	2	2,489,424	0.1
10-14	11	5,350,817	0.2	8	2,740,401	0.3	3	2,610,416	0.1
15-19	142	5,820,227	2.4	78	2,984,875	2.6	64	2,835,352	2.3
20-24	618	6,387,609	9.7	384	3,298,886	11.6	234	3,088,723	7.6
25-29	546	6,240,355	8.7	303	3,215,593	9.4	243	3,024,762	8.0
30-34	369	6,752,234	5.5	202	3,446,983	5.9	167	3,305,251	5.1
35-39	398	7,550,808	5.3	214	3,827,830	5.6	184	3,722,978	4.9
40-44	439	8,717,544	5.0	255	4,417,033	5.8	184	4,300,511	4.3
45-49	546	9,802,211	5.6	318	4,956,536	6.4	228	4,845,675	4.7
50-54	547	8,566,789	6.4	367	4,308,583	8.5	180	4,258,206	4.2
55-59	507	7,711,064	6.6	339	3,852,277	8.8	168	3,858,787	4.4
60-64	608	7,522,880	8.1	416	3,713,166	11.2	192	3,809,714	5.0
65-69	864	8,708,702	9.9	595	4,216,518	14.1	269	4,492,184	6.0
70-74	1,172	8,686,121	13.5	818	4,095,409	20.0	354	4,590,712	7.7
75-79	1,638	7,240,805	22.6	1070	3,237,948	33.0	568	4,002,857	14.2
80-84	1,951	5,328,280	36.6	1145	2,198,218	52.1	806	3,130,062	25.8
85-89	2,110	3,611,674	58.4	1115	1,273,782	87.5	995	2,337,892	42.6
90+	1,967	2,309,313	85.2	882	577,652	152.7	1085	1,731,661	62.7
Total	14,460	126,166,948	11.5	8,521	61,411,332	13.9	5,939	64,755,616	9.2

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Table s3. Number of TB notification among those aged 65 and above, 2010-2019

Notification year	Age group		
	65-74	75-84	85+
2010	3,918	6,102	3,725
2011	3,566	6,166	4,024
2012	3,459	5,711	4,137
2013	3,322	5,589	4,316
2014	3,205	5,171	4,447
2015	3,037	4,877	4,252
2016	2,747	4,580	4,415
2017	2,636	4,242	4,318
2018	2,315	3,912	4,170
2019	2,036	3,589	4,077

Table s4. Notification rate per 100,000 by prefectures, 2019

Prefecture	Rate per 100,000	Prefecture	Rate per 100,000
Hokkaido	7.4	Tottori	7.7
Aomori	9.0	Shimane	8.0
Iwate	6.8	Okayama	9.8
Miyagi	7.3	Hiroshima	10.1
Akita	6.8	Yamaguchi	11.3
Yamagata	7.7	Tokushima	13.2
Fukushima	6.9	Kagawa	10.4
Ibaraki	10.5	Ehime	8.4
Tochigi	9.7	Kochi	11.0
Gunma	8.0	Fukuoka	12.0
Saitama	10.7	Saga	13.3
Chiba	11.1	Nagasaki	13.1
Tokyo	13.0	Kumamoto	10.0
Kanagawa	10.7	Oita	13.3
Niigata	8.5	Miyazaki	9.4
Toyama	9.7	Kagoshima	11.4
Ishikawa	8.8	Okinawa	12.1
Fukui	9.0		
Yamanashi	9.5		
Nagano	7.6		
Gifu	14.6		
Shizuoka	9.8		
Aichi	13.6		
Mie	9.4		
Shiga	10.5		
Kyoto	13.7		
Osaka	18.4		
Hyogo	14.0		
Nara	14.0		
Wakayama	12.6		

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Table s5. Number and proportion of TB notifications by sex and occupation (aged 25-64), 2019

Occupation	Total		Male		Female	
	n	%	n	%	n	%
Doctors	23	100.0	17	73.9	6	26.1
Nurses	140	100.0	12	8.6	128	91.4
Other HCWs	190	100.0	59	31.1	131	68.9
Full- and part-time employed	1,658	100.0	1,222	73.7	436	26.3
Service industry	248	100.0	126	50.8	122	49.2
Teachers	47	100.0	18	38.3	29	61.7
Temporary employed	239	100.0	129	54.0	110	46.0
Self-employed	242	100.0	191	78.9	51	21.1
Houseworkers	92	100.0	1	1.1	91	98.9
Students	138	100.0	76	55.1	62	44.9
Others	115	100.0	65	56.5	50	43.5
Unemployed	725	100.0	439	60.6	286	39.4
Unknown	103	100.0	59	57.3	44	42.7
TOTAL	3,960	100.0	2,414	61.0	1,546	39.0

Table s6.a. Number and proportion of those homeless among TB notifications (aged 25-64), 2019

	Homeless (a)	Not homeless (b)	Unknown (c)	Total (d)*	Total excluding unknown (d-c)	Proportion of homeless (a/(d-c)*100) (%)
Total	59	2,095	514	2,668	2,154	2.7
Sex						
Male	56	1,209	352	1,617	1,265	4.4
Female	3	886	162	1,051	889	0.3
Age group						
25-34	4	484	169	657	488	0.8
35-44	10	460	81	551	470	2.1
45-54	20	590	134	744	610	3.3
55-64	25	561	130	716	586	4.3
Country of birth						
Japan-born	57	1,625	295	1,977	1,682	3.4
Foreign-born	1	465	193	659	466	0.2
COB unknown	1	5	26	32	6	16.7

COB = country of birth

* Homeless status known for 2,668 of 3,960 TB cases aged 25-64

Table s6.b. Number and proportion of those unemployed among TB notifications (aged 25-64), 2019

	Unemployed (a)	Employed (b)	Unknown (c)	Total (d)	Total excluding unknown (d-c)	Proportion of unemployed (a/(d-c)*100) (%)
Total	725	3,132	103	3,960	3,857	18.8
Sex						
Male	439	1,916	59	2,414	2,355	18.6
Female	286	1,216	44	1,546	1,502	19.0
Age group						
25-34	72	820	23	915	892	8.1
35-44	109	705	23	837	814	13.4
45-54	202	863	28	1,093	1,065	19.0
55-64	342	744	29	1,115	1,086	31.5
Country of birth						
Japan-born	603	2,323	68	2,994	2,926	20.6
Foreign-born	107	768	29	904	875	12.2
COB unknown	15	41	6	62	56	26.8

COB = country of birth

Table s6.c. Number and proportion of those on social welfare among TB notifications (aged 25-64), 2019

	On social welfare (a)	Not on social welfare (b)	Unknown (c)	Total (d)	Total excluding unknown (d-c)	Proportion of those on social welfare (a/(d-c)*100) (%)
Total	229	3,658	73	3,960	3,887	5.9
Sex						
Male	192	2,173	49	2,414	2,365	8.1
Female	37	1,485	24	1,546	1,522	2.4
Age group						
25-34	3	894	18	915	897	0.3
35-44	26	794	17	837	820	3.2
45-54	72	1,004	17	1,093	1,076	6.7
55-64	128	966	21	1,115	1,094	11.7
Country of birth						
Japan-born	210	2,740	44	2,994	2,950	7.1
Foreign-born	13	870	21	904	883	1.5
COB unknown	6	48	8	62	54	11.1

COB = country of birth

Table s6.d. Number and proportion of those without health insurance among TB notifications (aged 25-64), 2019

	No insurance (a)	With insurance (b)	Unknown (c)	Total (d)	Total excluding unknown (d-c)	Proportion of those with no insurance (a/(d-c)*100) (%)
Total	24	3,863	73	3,960	3,887	0.6
Sex						
Male	21	2,344	49	2,414	2,365	0.9
Female	3	1,519	24	1,546	1,522	0.2
Age group						
25-34	3	894	18	915	897	0.3
35-44	3	817	17	837	820	0.4
45-54	6	1,070	17	1,093	1,076	0.6
55-64	12	1,082	21	1,115	1,094	1.1
Country of birth						
Japan-born	23	2,927	44	2,994	2,950	0.8
Foreign-born	0	883	21	904	883	0.0
COB unknown	1	53	8	62	54	1.9

COB = country of birth

Table s7. Clinical characteristics of TB notifications by age groups, 2019

Age group	EPTB bac	EPTB clin	PTB bac	PTB clin	TOTAL
0-4	2	6	3	7	18
5-14	2	3	3	12	20
15-24	61	63	467	169	760
25-34	99	64	552	200	915
35-44	76	76	546	139	837
45-54	117	116	684	176	1093
55-64	104	127	695	189	1115
65-74	204	256	1389	187	2036
75-84	497	492	2368	232	3589
85+	490	511	2906	170	4077
TOTAL	1,652	1,714	9,613	1,481	14,460

EPTB = extrapulmonary tuberculosis, bac = bacteriologically confirmed, clin = clinically confirmed, PTB = pulmonary tuberculosis

Table s8. Number and rate per 100,000 of foreign-born TB, 2010-2019

Notification year	No.cases	Rate per 100,000
2010	952	45.6
2011	921	45
2012	1,069	52.6
2013	1,064	51.5
2014	1,101	51.9
2015	1,164	50.1
2016	1,338	56.2
2017	1,530	59.7
2018	1,667	61
2019	1,541	52.5

Table s9 Number and proportion* of foreign-born TB by age group, 2010-2019
* Note: the denominator excludes those whose country of birth is unknown

Notification year	Total		0-14		15-24		25-34		35-44		45-54		55+	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
2010	952	4.2	9	10.5	274	30.1	341	19.4	165	8.8	82	4.7	81	0.5
2011	921	4.1	8	9.6	245	31.5	343	21.7	161	8.9	85	4.9	79	0.5
2012	1,069	5.2	7	11.1	304	42.2	357	25.4	196	12.1	106	7.1	99	0.6
2013	1,064	5.4	7	10.8	319	46.8	361	28.7	177	12.6	97	6.8	103	0.7
2014	1,101	5.8	8	17.0	339	47.9	376	31.0	180	13.9	115	8.4	83	0.6
2015	1,164	6.6	9	18.4	353	52.6	423	38.5	174	14.1	101	8.0	104	0.8
2016	1,338	7.9	12	20.3	471	58.6	478	43.6	175	17.1	107	8.9	95	0.8
2017	1,530	9.5	11	19.6	503	67.3	565	51.6	219	22.7	114	9.5	118	1.0
2018	1,667	10.9	12	23.5	571	70.8	625	58.4	200	23.9	139	12.2	120	1.1
2019	1,541	10.9	10	26.3	554	73.5	549	60.4	186	22.5	117	10.9	125	1.2

Table s10. Foreign-born TB by country name, 2019

Country name	No.cases	Proportion (%)			
Vietnam	331	21.5	Hong Kong	2	0.1
The Philippines	308	20.0	Kenya	2	0.1
China	253	16.4	Nigeria	2	0.1
Indonesia	160	10.4	Democratic People's Republic of Korea	2	0.1
Nepal	146	9.5	Senegal	2	0.1
Myanmar	53	3.4	Singapore	2	0.1
Unknown and others	42	2.7	Afghanistan	1	0.1
Republic of Korea	36	2.3	Argentina	1	0.1
India	32	2.1	Bolivia	1	0.1
Thailand	26	1.7	Cameroon	1	0.1
Cambodia	24	1.6	Colombia	1	0.1
Brazil	23	1.5	UK	1	0.1
Mongolia	16	1.0	Ghana	1	0.1
Bangladesh	11	0.7	Laos	1	0.1
Bhutan	10	0.6	Mexico	1	0.1
Pakistan	10	0.6	Malawi	1	0.1
Taiwan	9	0.6	Palau	1	0.1
Peru	7	0.5	Tanzania	1	0.1
Sri Lanka	6	0.4	Uganda	1	0.1
Malaysia	5	0.3	Uzbekistan	1	0.1
Turkey	3	0.2	South Africa	1	0.1
Ethiopia	2	0.1	Zambia	1	0.1
			TOTAL	1541	100.0

Table s11. Foreign-born TB by selected countries of birth, 2010-2019

Notification year	China	the Philippines	Nepal	Vietnam	Indonesia
2010	273	216	39	24	64
2011	273	218	38	52	49
2012	294	290	42	63	57
2013	292	256	65	68	57
2014	259	292	88	109	53
2015	249	284	108	135	78
2016	272	318	135	212	90
2017	258	321	164	257	121
2018	274	340	170	289	171
2019	253	308	146	331	160

Note: the numbers have been updated since the previous year and may differ from the last year's report for some countries, and for some years

Table s12. Foreign-born TB by year of entry to Japan, 2012-2019

Notification year	same year	previous year	3-5 years ago	6-10 years ago	more than 10 years	year of entry unknown	TOTAL
2012	135	115	150	105	140	424	1,069
2013	147	133	152	104	141	387	1,064
2014	143	156	138	86	151	427	1,101
2015	168	165	172	76	137	446	1,164
2016	201	228	179	76	152	502	1,338
2017	230	261	247	93	140	559	1,530
2018	291	310	281	99	193	493	1,667
2019	244	288	304	80	188	437	1,541

Table s13. TB notification among children aged 0-14 by country of birth, 2010-2019

Notification year	Total no. cases	Of which Japan-born	Of which foreign-born	Of which COB unknown
2010	89	77	9	3
2011	84	75	8	1
2012	63	56	7	0
2013	66	58	7	1
2014	49	39	8	2
2015	51	40	9	2
2016	59	47	12	0
2017	59	45	11	3
2018	51	39	12	0
2019	38	28	10	0

COB = country of birth

Table s14.a. Source of infection of childhood TB by country of birth, 2019

Country of birth	Father	Mother	Grandparents	Others	Unknown	TOTAL
Japan-born	1	3	2	2	0	8
Foreign-born	2	0	0	0	0	2

COB = country of birth

Table s14.b. Mode of detection of childhood TB by country of birth, 2019

Country of birth	Screening at school	Contact investigation (family)	Contact investigation (casual)	Visit hospital with symptoms	hospitalized for other diseases	Visit hospital for other diseases	Others	TOTAL
Japan-born	0	8	1	14	1	2	2	28
Foreign-born	1	3	1	2	1	0	2	10

COB = country of birth

Table s15. Number of PTB and culture confirmed PTB, 2010-2019

Notification year	PTB	Of which culture confirmed	Proportion of culture confirmed
2010	18,328	11,495	62.7
2011	17,519	10,915	62.3
2012	16,432	11,261	68.5
2013	15,972	10,523	65.9
2014	15,149	10,259	67.7
2015	14,123	10,035	71.1
2016	13,608	9,878	72.6
2017	13,001	9,580	73.7
2018	12,033	9,016	74.9
2019	11,094	8,110	73.1

PTB = pulmonary tuberculosis

Table s16. Number and proportion of cases with DST results to INH and RFP known, 2012-2019

Notification year	Culture confirmed cases	Of which DST results to INH and RFP known	
		n	%
2012	12,420	9,134	73.5
2013	11,698	8,409	71.9
2014	11,484	8,439	73.5
2015	11,283	8,511	75.4
2016	11,151	8,638	77.5
2017	10,886	8,856	81.4
2018	10,319	8,584	83.2
2019	9,396	7,613	81.0

DST= drug susceptibility test, INH = isoniazid, RFP = rifampicin

Table s17. Number and proportion of cases with MDR by country of birth, 2012-2019

Notification year	DST results known (total)	Of which MDR (total)		DST results known (Japan-born)	Of which MDR (Japan-born)		DST results known (Foreign-born)	Of which MDR (Foreign-born)	
		n	%		n	%		n	%
2012	9,134	64	0.7	8,471	45	0.7	382	15	4.2
2013	8,409	49	0.6	7,692	31	0.6	404	16	4.7
2014	8,439	58	0.7	7,728	35	0.7	397	21	5.5
2015	8,511	48	0.6	7,710	30	0.7	453	16	4.9
2016	8,638	50	0.6	7,692	35	0.7	562	15	3.6
2017	8,856	55	0.6	7,741	26	0.3	741	27	3.6
2018	8,584	60	0.7	7,625	30	0.4	804	30	3.7
2019	7,613	45	0.6	6,765	24	0.4	740	21	2.8

RR = rifampicin resistant, MDR = multi-drug resistance
Note: total includes those country of birth unknown.   No. of DST results known and of which RR/MDR among those country of birth unknown are not shown in the table.

Table s18 Number and proportion of cases with INH resistance by country of birth, 2012-2019

Notification year	DST results known (total)	Of which resistant to INH (total)		DST results known (Japan-born)	Of which resistant to INH (Japan-born)		DST results known (Foreign-born)	Of which resistant to INH (Foreign-born)	
		n	%		n	%		n	%
2012	9,134	341	3.7	8,471	299	3.5	382	32	8.4
2013	8,409	339	4.0	7,692	300	3.9	404	34	8.4
2014	8,439	311	3.7	7,728	276	3.6	397	26	6.5
2015	8,511	351	4.1	7,710	304	3.9	453	33	7.3
2016	8,638	342	4.0	7,692	265	3.4	562	61	10.9
2017	8,856	364	4.1	7,741	298	3.8	741	54	7.3
2018	8,584	353	4.1	7,625	281	3.7	804	68	8.5
2019	7,613	349	4.6	6,765	281	4.2	740	65	8.8

INH = isoniazid
Note: total includes those country of birth unknown.   No. of DST results known and of which RR/MDR among those country of birth unknown are not shown in the table.

Table s19. Number and proportion of those with delay among symptomatic pulmonary TB, 2010-2019

Notification year	Patient delay			Doctor delay			Total delay		
	Total	n	%	Total	n	%	Total	n	%
2010	8,940	1,637	18.3	13,094	2,958	22.6	9,022	1,770	19.6
2011	8,763	1,629	18.6	12,540	2,843	22.7	8,837	1,717	19.4
2012	8,177	1,532	18.7	11,302	2,481	22.0	8,226	1,613	19.6
2013	7,854	1,419	18.1	10,889	2,403	22.1	7,906	1,482	18.7
2014	6,901	1,297	18.8	10,156	2,198	21.6	6,967	1,325	19.0
2015	6,678	1,335	20.0	9,688	2,087	21.5	6,721	1,373	20.4
2016	6,703	1,323	19.7	9,213	2,024	22.0	6,754	1,322	19.6
2017	6,295	1,312	20.8	8,602	1,870	21.7	6,328	1,342	21.2
2018	6,253	1,289	20.6	7,979	1,752	22.0	6,293	1,301	20.7
2019	5,458	1,112	20.4	7,273	1,585	21.9	5,491	1,191	21.7

*Note: total excluding those cases without data on delay

Table s20. Number of LTBI notifications by country of birth, 2010-2019

Notification year	Total no. cases	Of which Japan-born	Of which foreign-born	Of which COB unknown
2010	4,930	4,587	293	50
2011	10,046	9,464	493	89
2012	8,771	8,037	487	247
2013	7,147	6,474	425	248
2014	7,562	6,823	523	216
2015	6,675	5,940	540	195
2016	7,477	6,499	650	328
2017	7,255	6,244	757	254
2018	7,414	6,293	963	158
2019	7,684	6,610	905	169

COB = country of birth

Table s21. Mode of detection of LTBI cases, 2019

Mode of detection	n	%
Individual health check	110	1.4
Regular screening	523	6.8
Contact investigation	4,422	57.5
Other mass investigation	78	1.0
At hospital setting	2,312	30.1
Others	212	2.8
Unknown	26	0.3
During follow-up for TB	1	0.0
TOTAL	7,684	100.0

Table s22.Trend in the mode of detection of LTBI cases, 2007-2019

Notification year	Individual health check		Regular screening		Contact investigation		Other mass investigation		At hospital setting		Others, unknown, during follow-up		TOTAL
	n	%	n	%	n	%	n	%	n	%	n	%	n
2007	25	0.8	79	2.7	2,455	83.0	55	1.9	204	6.9	141	4.8	2,959
2008	74	1.5	153	3.2	4,066	84.1	111	2.3	306	6.3	122	2.5	4,832
2009	84	2.0	183	4.4	3,417	83.0	50	1.2	305	7.4	80	1.9	4,119
2010	93	1.9	241	4.9	4,065	82.5	64	1.3	348	7.1	119	2.4	4,930
2011	219	2.2	660	6.6	7,979	79.4	360	3.6	626	6.2	202	2.0	10,046
2012	149	1.7	817	9.3	6,705	76.4	198	2.3	714	8.1	188	2.1	8,771
2013	106	1.5	552	7.7	5,295	74.1	98	1.4	914	12.8	182	2.5	7,147
2014	98	1.3	605	8.0	5,333	70.5	101	1.3	1,232	16.3	193	2.6	7,562
2015	96	1.4	496	7.4	4,507	67.5	47	0.7	1,345	20.1	184	2.8	6,675
2016	122	1.6	500	6.7	4,974	66.5	99	1.3	1,586	21.2	196	2.6	7,477
2017	109	1.5	469	6.3	4,524	62.4	74	1.0	1,893	26.1	186	2.6	7,255
2018	102	1.4	546	7.4	4,388	59.2	45	0.6	2,132	28.8	201	2.7	7,414
2019	110	1.4	523	6.8	4,422	57.5	78	1.0	2,312	30.1	239	3.1	7,684

Appendix V: Supplementary data

Table sd1. Population used to calculate the notification rates, 2019

Age group	Total	Male	Female
0-4	4,758,372	2,437,923	2,320,449
5-9	5,101,143	2,611,719	2,489,424
10-14	5,350,817	2,740,401	2,610,416
15-19	5,820,227	2,984,875	2,835,352
20-24	6,387,609	3,298,886	3,088,723
25-29	6,240,355	3,215,593	3,024,762
30-34	6,752,234	3,446,983	3,305,251
35-39	7,550,808	3,827,830	3,722,978
40-44	8,717,544	4,417,033	4,300,511
45-49	9,802,211	4,956,536	4,845,675
50-54	8,566,789	4,308,583	4,258,206
55-59	7,711,064	3,852,277	3,858,787
60-64	7,522,880	3,713,166	3,809,714
65-69	8,708,702	4,216,518	4,492,184
70-74	8,686,121	4,095,409	4,590,712
75-79	7,240,805	3,237,948	4,002,857
80-84	5,328,280	2,198,218	3,130,062
85-89	3,611,674	1,273,782	2,337,892
90+	2,309,313	577,652	1,731,661
Total	126,166,948	61,411,332	64,755,616

Source: Population as of October 1, 2019. Current population estimates, Statistics Bureau, Ministry of Internal Affairs and Communications http://www.stat.go.jp/data/jinsui/
Note: The age group specific population does not necessarily add up to TOTAL as the numbers are based on population census. For details, please contact the Ministry of Internal Affairs and Communications, Japan.

Table sd2. Population used to calculate the notification rates among the foreign-born, 2010-2019

Notification year	Population of foreign-born
2010	2,087,261
2011	2,047,349
2012	2,033,656
2013	2,066,445
2014	2,121,831
2015	2,323,189
2016	2,382,822
2017	2,561,848
2018	2,731,093
2019	2,933,137

Source: Population of foreign-born residents. Foreign residents' statistics, Ministry of Justice
http://www.moj.go.jp/housei/toukei/toukei_ichiran_touroku.html