TUBERCULOSIS IN JAPAN

ANNUAL REPORT 2024

TUBERCULOSIS SURVEILLANCE CENTER

Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association

CONTENTS

1 Newly Notified Tuberculosis Patients and Notification Rates and Their Trends

The number of patients diagnosed and notified with tuberculosis in Japan in 2023 was 10,096. The notification rate per 100,000 population (hereinafter referred to as "Notification Rate") was 8.1*. Of these, 7,495 patients with pulmonary tuberculosis (PTB) accounted for 74.2% of newly notified tuberculosis patients, while there were 2,601 extra-pulmonary tuberculosis patients, making up 25.8% of the total.

The number of sputum smear-positive PTB patients was 3,524, representing 47.0% of all PTB patients. The number of bacteriologically-positive PTB patients, including sputum smear-positive cases, for whom *Mycobacterium tuberculosis* was detected was 6,617, or 88.3% of all PTB patients. Additionally, 878 were bacteriologically-negative or bacteriologically-unidentified PTB patients reported by clinical diagnosis without *Mycobacterium tuberculosis* detection, accounting for 11.7% of PTB patients.
Furthermore, there were 5,033 newly notified cases of latent tuberculosis infection requiring treatment, with a notification rate of 4.0.
Figure 1-1 shows trends in the number of newly notified tuberculosis patients and notification rates since 2000.

The trend from 2022 to 2023 showed a decrease in newly notified patients by 1.4%, amounting to 139 fewer cases. The notification rate decreased from 8.2 in 2022 by 0.1, a reduction rate of 1.2%. Before 2000, the notification rate had decreased at an average rate of 10.6% per year from 1968 to 1979, but since 1980, the rate of decrease has slowed to around 4–5% per year. Following the COVID-19 pandemic, the notification rate decreased by approximately 10% per year from 2020 to 2022, but in 2023, the decrease slowed to 1.2%.
(*: "Population Estimates" by the Statistics Bureau, Ministry of Internal Affairs and Communications, Japan, were used to calculate notification rates [https://www.stat.go.jp/data/jinsui/index.html] accessed on July 1, 2024.)

The age distribution of newly notified tuberculosis patients was skewed toward the elderly group. In 5–year age groups, the highest number of male patients was observed in the 80–84 age group, while among females, those aged 90 and older were most prevalent. A small peak was also observed in the 20s, attributed to tuberculosis patients born outside of Japan (see section 5 on Tuberculosis in Patients of Foreign-Born).

The number of newly notified patients by sex was 5,924 males and 4,172 females, with males 1.4 times more than females. The male-to-female ratio increased after age 45, reaching its peak in the 65–69 age group, where males were 2.6 times more numerous than females.
The average age of newly notified tuberculosis patients was 68.2 years (67.9 for males and 68.6 for females), and the median age was 76 years (75 for males and 79 for females) (Figure 1-2).

The notification rate of tuberculosis by sex and by age group was higher in males than in females and tended to increase with advancing age. Among those aged 50 years and older, the notification rate for males was 1.6 times higher than that for females, and in the age group of 65–69, the notification rate for males (9.5) was 2.7 times that for females (3.5). Since 2000, the notification rates for both males and females have shown a downward trend. Among males aged 90 years and older, the notification rate began to increase in 2009 but has decreased again since 2015. For females aged 90 years and older, no clear downward trend was observed until 2019, but a decrease has been evident since 2020 (Figure 1-3).

Although the incidence of tuberculosis is decreasing among the elderly, the low incidence in other age groups and the growing elderly population due to the aging of Japan's population have increased the total number of elderly tuberculosis patients, resulting in a relative bias toward elderly cases. The number of newly notified tuberculosis patients aged 65 years and older was 6,740, accounting for 66.8% of the total number of newly notified patients. Among them, 4,329 patients (42.9%) were aged 80 years and older. The proportion of tuberculosis patients aged 65 years and older was about half (48.3%) in 2000, but by 2015 it had reached 66.6%, encompassing two-thirds of newly notified patients. This increased to 70.2% in 2022 but decreased by 3.4 points to 66.8% in 2023. This decline is likely due to the relative increase in patients aged 20–39 who were foreign-born (Figure 1-4).

The number of newly notified tuberculosis patients aged 14 years and under in 2023 was 37 (16 males and 21 females), an increase of two from 35 in 2022. Among them, 27 were born in Japan, 8 were born outside Japan, and the country of birth was unknown for 2 patients. The most common age at new notification was 0 years, with 10 patients.

The trend in the number of newly notified pediatric tuberculosis patients has shown a sharp decrease, from 44,180 patients in 1965 to 18,197 in 1970, 1,893 in 1980, 518 in 1990, and 220 in 2000. In 2006, the number fell below 100 to 85 and has continued to decline, but since 2014, it has remained between 29 and 59 (Figure 1-5).

Among the pediatric tuberculosis cases notified in 2023, there were 2 cases of miliary tuberculosis and 3 cases of tuberculous meningitis, both considered severe forms of tuberculosis. The trend in the number of newly notified cases of miliary tuberculosis and tuberculous meningitis among children since 2000 is shown in Figure 1-6 (some patients are recorded as having both conditions). A few cases of both miliary tuberculosis and tuberculous meningitis are reported each year (Figure 1-6).

Regarding BCG vaccination history among the 37 newly notified pediatric tuberculosis patients in 2023, 19 had a history of BCG vaccination, 4 had no history of vaccination, and 14 had unknown vaccination history (no input). Among the 8 foreign-born patients, 4 had a BCG vaccination history, 1 had no

vaccination history, and 3 had an unknown vaccination history (no input). Information on the source of infection was provided for 13 pediatric tuberculosis patients. Among these sources, 8 were fathers, 2 were mothers, and 3 were grandparents.

Figure 1-1 Trend of number of newly notified tuberculosis patients and incidence rates, 2000 – 2023

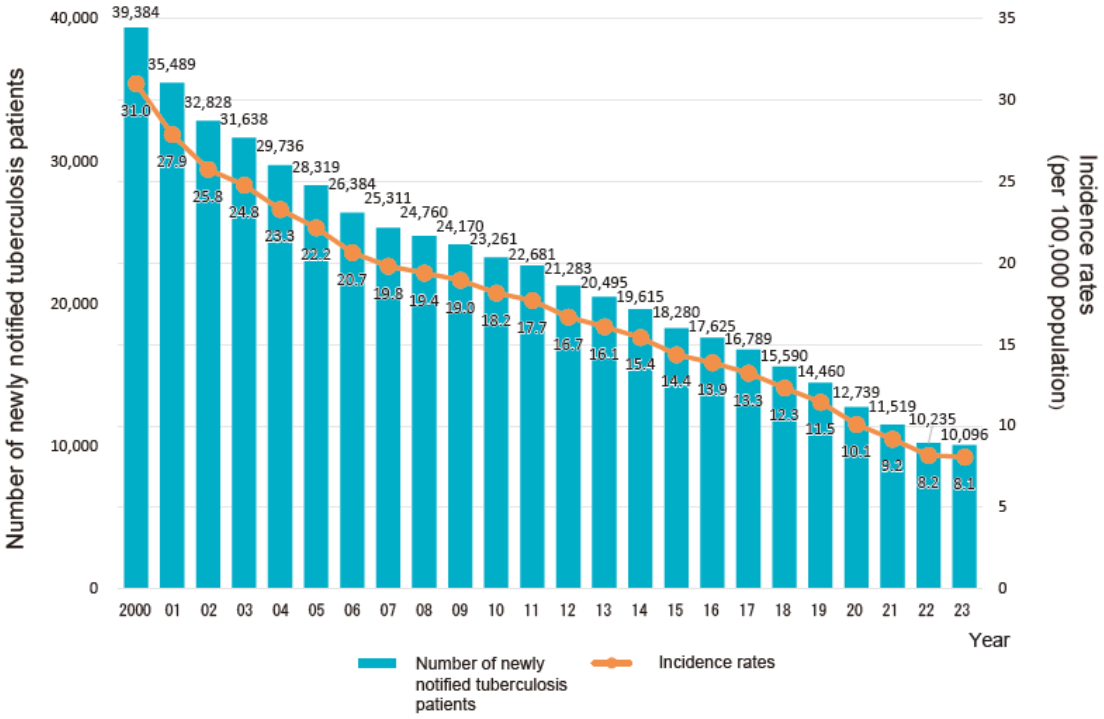


Figure 1-2 Number of newly notified tuberculosis patients by sex and age groups, 2023

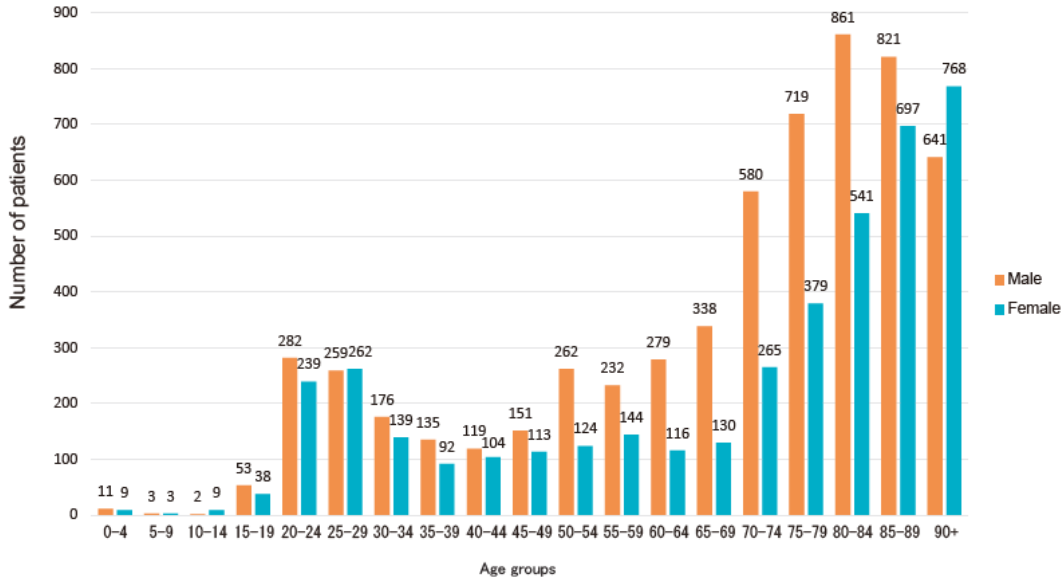


Figure 1-3 Trends in Tuberculosis incidence rates by sex and age groups, 2001-2023

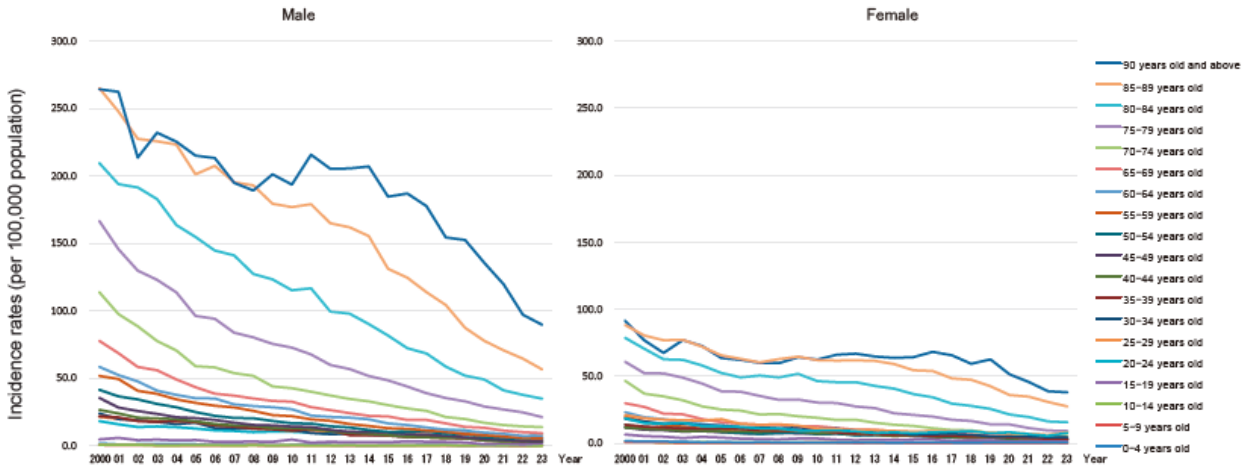


Figure 1-4 Trends in the ratio of the number of patients by age group to the total number of newly notified tuberculosis patients, 2000-2023

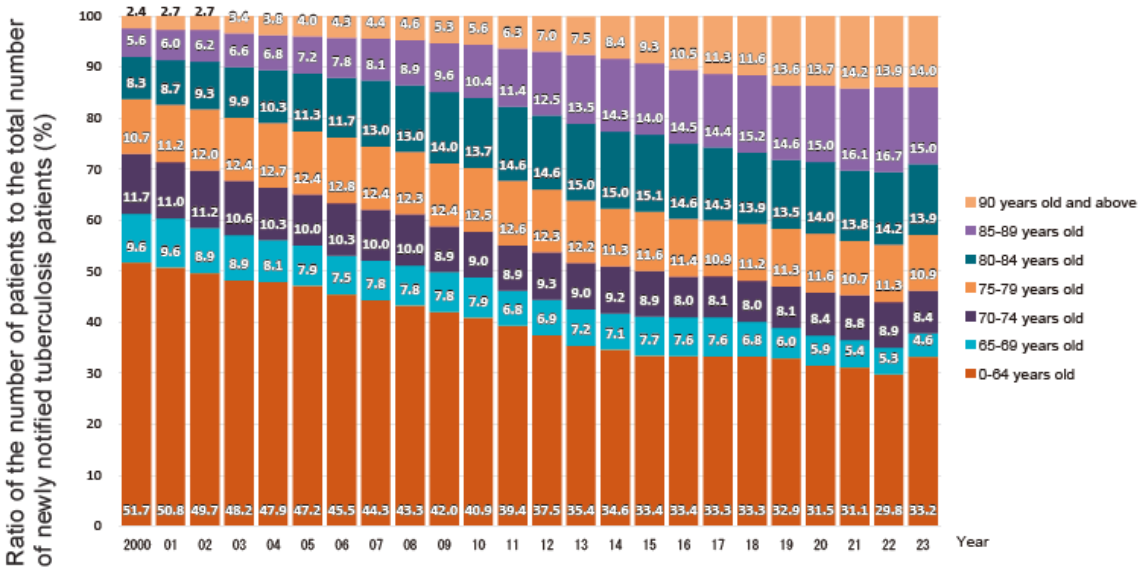


Figure 1-5 Trends in the number of newly notified pediatric tuberculosis patients (0-14 years old), 1965-2023

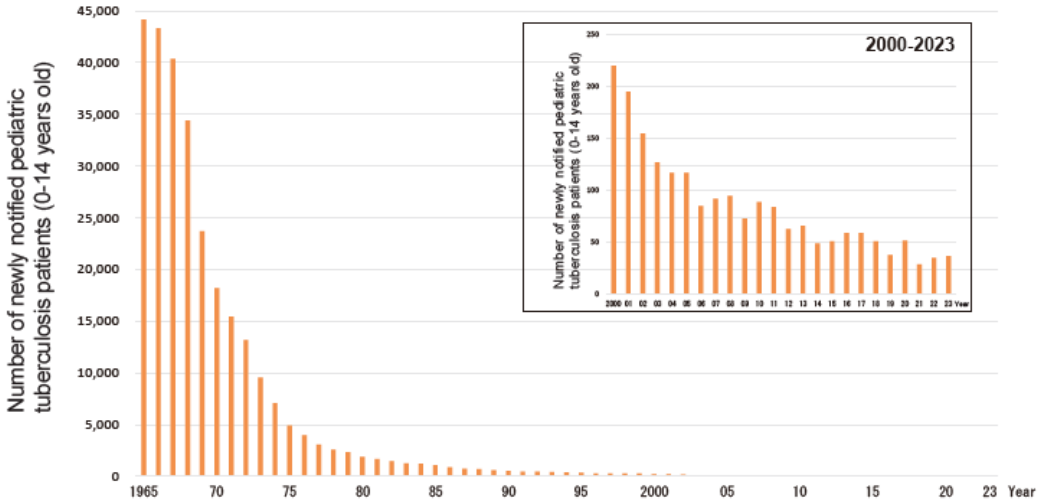
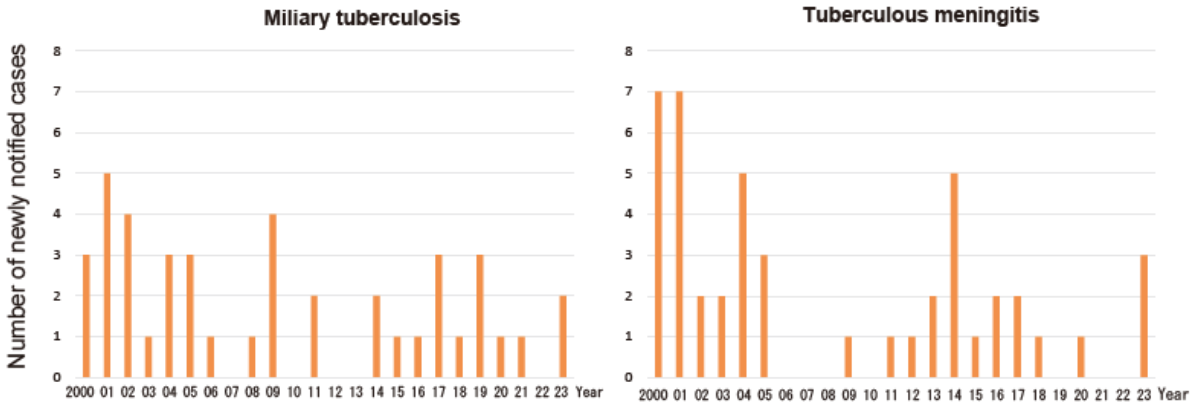


Figure 1-6 Trends in the number of newly notified cases of miliary tuberculosis and tuberculous meningitis in children with tuberculosis (0-14 years old), 2000-2023



2 Geographic Distribution of Newly Notified Tuberculosis Patients

Newly Notified Tuberculosis Patients and Notification Rates by Prefecture

The geographic distribution of newly notified tuberculosis patients in 2023 continued to exhibit a "west high, east low" trend, with fewer cases in eastern Japan, such as Hokkaido and Tohoku, and more cases in western Japan, ranging from Chubu and Kinki to Kyushu.

Among the 47 prefectures, the highest number of newly notified tuberculosis patients was in Tokyo, with 1,190 cases, of which 914 were notified in the special wards of Tokyo. The smallest number of cases was in Yamanashi Prefecture, with 32 cases.

The highest notification rate was 13.1 in Osaka Prefecture, followed by 12.2 in Oita Prefecture, 10.8 in Nara Prefecture, 10.2 in Hyogo Prefecture, and 9.9 in Kyoto Prefecture.

The lowest notification rate was 3.6 in Iwate Prefecture, followed by 4.0 in Yamanashi Prefecture, 4.4 in Yamagata Prefecture, and 5.2 in both Miyagi and Nagano Prefectures (ranked to the second decimal place).

The highest notification rate in Osaka Prefecture was 3.6 times the lowest in Iwate Prefecture.

Of the 47 prefectures, 43 had an notification rate of 10.0 or less. (Figure 2-1)

Number of Newly Notified Sputum Smear-Positive PTB Patients and Notification Rate by Prefecture

In 2023, the highest number of newly notified sputum smear-positive PTB patients among the 47 prefectures was in Tokyo, with 451 cases. The lowest numbers were in Fukui and Yamanashi Prefectures, with 9 cases each.

The highest notification rate of sputum smear-positive PTB was 4.7 in Nara Prefecture, followed by 4.7 in Osaka Prefecture (ranked to the second decimal place), 4.6 in Oita Prefecture, and 3.9 in both Kagoshima and Hyogo Prefectures (ranked to the second decimal place).

The lowest notification rate was 1.1 in Yamanashi Prefecture, followed by 1.2 in Fukui Prefecture, 1.5 in Niigata Prefecture, and 1.6 in both Gunma and Iwate Prefectures (ranked to the second decimal place). (Figure 2-1)

Geographic Distribution of Newly Notified Tuberculosis Patients of Foreign-Born

Among the 1,619 newly notified foreign-born tuberculosis patients in 2023, Tokyo had the highest number, with 206 patients, followed by 128 in Osaka Prefecture, 126 in Aichi Prefecture, 100 in Saitama Prefecture, and 93 in Kanagawa Prefecture.

The proportion of foreign-born patients among newly notified tuberculosis patients was the highest in Gunma Prefecture (47 foreign-born patients) at 38.5%. This was followed by 33.3% in Fukui Prefecture (14 patients), 29.0% in Gifu Prefecture (51 patients), 25.1% in Ibaraki Prefecture (60 patients), and 25.0% in Kagawa Prefecture (16 patients).

The lowest proportion of foreign-born patients was in Tokushima Prefecture at 3.8% (2 foreign-born patients). A higher proportion of foreign-born patients was observed in the Northern Kanto and Chubu

regions. (Figure 2-2)

Geographic Distribution of Newly Notified Tuberculosis Patients Among the Elderly

The highest proportion of newly notified tuberculosis patients aged 65 years and older in 2023 was in Tottori Prefecture, where 30 patients aged 65 years and older accounted for 90.9% of all patients, with over 90% of cases being elderly. This was followed by 84.6% in Tokushima Prefecture (44 patients), 83.3% in Akita Prefecture (40 patients), 79.7% in Miyazaki Prefecture (51 patients), and 79.1% in Ehime Prefecture (68 patients).

On the other hand, Gunma Prefecture (61 patients) had the lowest rate at 50.0%. This was followed by 57.0% in Chiba Prefecture (266 patients), 57.7% in Ibaraki Prefecture (138 patients), 57.9% in Tokyo (689 patients), and 59.7% in Saitama Prefecture (347 patients). There was a 1.8-fold difference between the lowest rate in Gunma Prefecture and the highest rate in Tottori Prefecture.

Regarding patients aged 80 years and older, Tottori Prefecture had the highest proportion, with 22 patients accounting for 66.7%, meaning two out of three newly notified tuberculosis patients were aged 80 years or older. The lowest proportion was in Saitama Prefecture, with 33.0% (192 patients), where one in three patients was aged 80 years or older.

Areas with a high proportion of foreign-born patients, such as Northern Kanto and Chubu regions, as well as the Tokyo metropolitan area, tended to have a lower proportion of elderly tuberculosis patients. (Figure 2-3)

Figure 2-1 Map of notification rates and sputum smear-positive pulmonary tuberculosis notification rates by prefectures, 2023

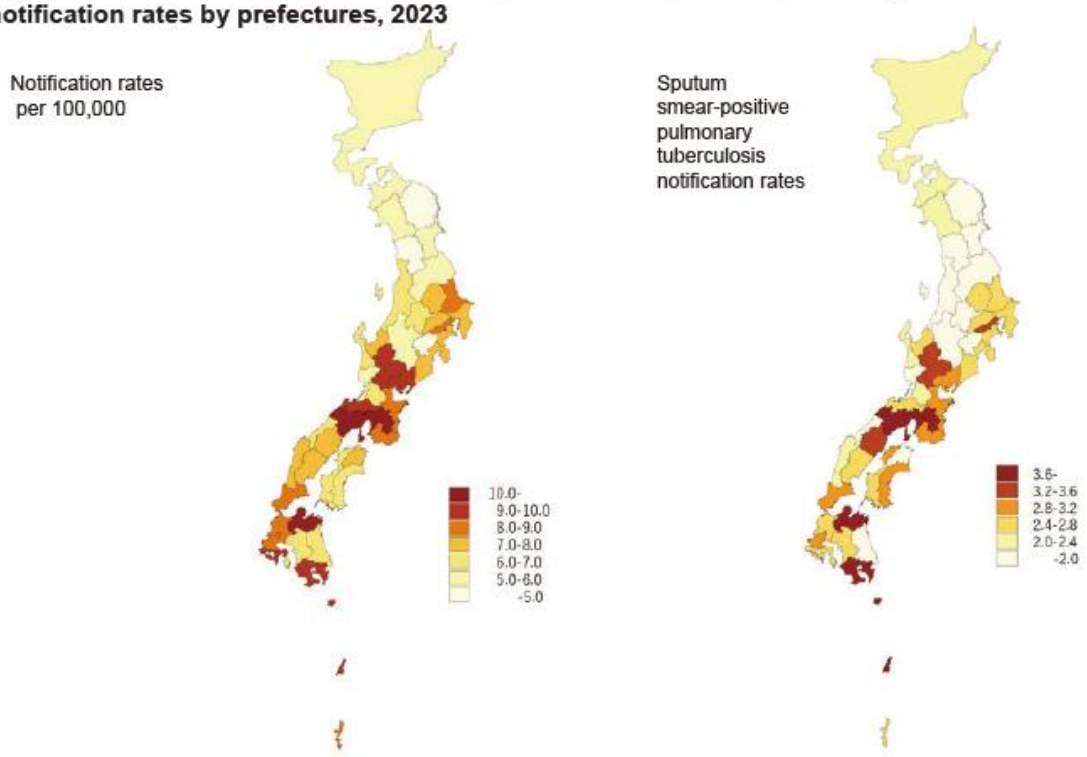


Figure 2-2 Proportion of newly notified foreign-born tuberculosis patients by prefectures, 2023

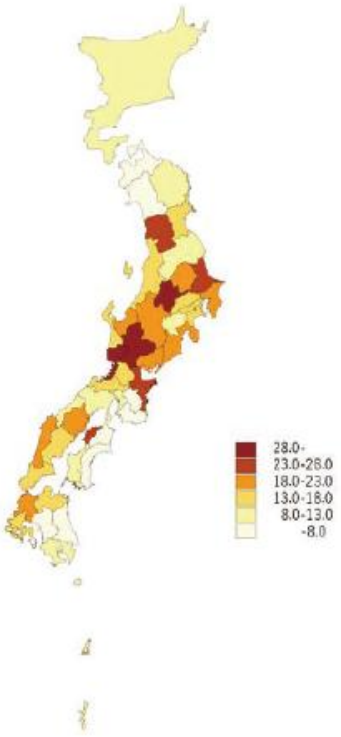
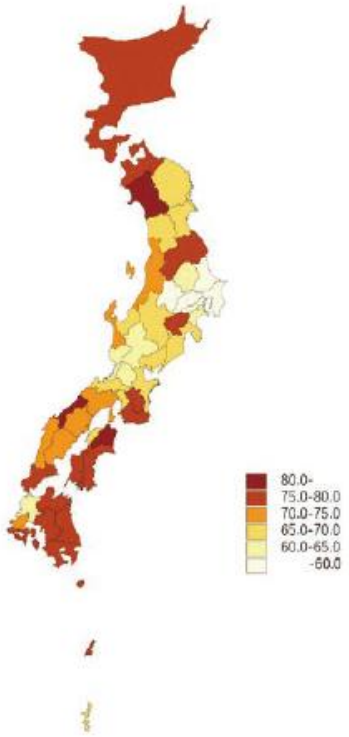


Figure 2-3 Proportion of newly notified 65 years old and older tuberculosis patients by prefectures, 2023



3 Clinical Background of Newly Notified Tuberculosis Patients

Pulmonary and Extra-pulmonary Tuberculosis

In classifying the activity of notified tuberculosis patients, PTB includes PTB and tracheal/bronchial tuberculosis. Therefore, it is necessary to distinguish between PTB in a broad sense, which includes tracheal and bronchial tuberculosis, and PTB in a narrow sense, which does not include them. However, this section specifically deals with PTB in a narrow sense. Additionally, when PTB coexists with extra-pulmonary tuberculosis, the patients are counted in both categories. Similarly, when multiple organs are affected in extra-pulmonary tuberculosis, the patients are counted multiple times. As a result, the total count exceeds the number of newly notified tuberculosis patients.

Of the 10,096 newly notified tuberculosis patients in 2023, 7,495 had PTB, and 4,033 had extra-pulmonary tuberculosis.

Table 3-1 shows the distribution of extra-pulmonary tuberculosis by organ. The most common type was tuberculous pleurisy, with 1,867 cases (46.3%), accounting for nearly half of all cases. This was followed by lymph node tuberculosis outside the pulmonary hilum and mediastinum, with 597 cases (14.8%), and miliary tuberculosis, with 526 cases (13.0%).

Positive Percentage by PTB Tests

In 2023, smear tests were positive in 50.5% (3,782 patients) of 7,495 newly notified PTB patients. Among them, 3,278 patients (43.7%) were smear-positive by sputum specimens.

Culture tests were positive in 73.6% (5,515 patients). The proportion of patients undergoing culture tests decreased to 5.4% in 2018, but increased from 2019 onward, reaching 10.3% in 2021. However, in 2023, it decreased to 6.6% (491 patients). This temporary increase is thought to be due to the impact of public health center responses to COVID-19, but it has since returned to pre-pandemic levels. Since this is an area that can be improved through public health interviews, further efforts are needed to improve the collection rate of culture test results (Figure 3-1).

The nucleic acid amplification (NAA) test was positive for *Mycobacterium tuberculosis* in 74.3% (5,566 patients).

Tables 3-2 to 3-4 show the cross-tabulation of smear test results, culture test results, and NAA test results for newly notified PTB patients. 62.7% (2,288/3,651) were smear-negative and culture-positive, 57.7% (2,106/3,651) were smear-negative and NAA-positive, 38.6% (490/1,271) were culture-negative and NAA-positive, and 38.5% (390/1,012) were NAA-negative and culture-positive.

Indicators of Infectivity - Percentage of PTB with Cavities and Percentage of Sputum Smear-Positive

Among 7,495 newly notified PTB patients in 2023 (4,600 males and 2,895 females), the percentage of those with cavities was 28.4% (2,125 patients) overall. By sex, 31.1% (1,430 patients) of males had cavities, compared to 24.0% (695 patients) of females, a difference of 7.1 percentage points.

The overall percentage of sputum smear-positive cases was 47.0% (3,524 patients). By sex, 48.1% (2,213

patients) of males and 45.3% (1,311 patients) of females were smear-positive, showing no significant difference between genders.

Figure 3-2 shows the percentage of PTB patients with cavities and sputum smear-positive cases by sex and age group. The percentage of adult females with cavities ranged from approximately 16% to 32%, while that of adult males ranged from approximately 23% to 45%. The overall trend was closer to that of males. Older patients are sometimes considered less likely to have cavities, which may be due to the fact that the proportion of cavities in males aged 45-69 can exceed 40%, while there is a noticeable decline after age 70. This pattern might be interpreted as a tendency for older patients to develop fewer cavities. In females, the proportion remained relatively stable from age 15 onward, showing no decreasing trend.

The proportion of sputum smear-positive cases tended to increase with age in both males and females, reaching over 50% in males aged 70 and older and in females aged 80 and older.

Among the 7,495 PTB patients, 20.3% (1,521 patients) had both cavities and were sputum smear-positive, 8.1% (604 patients) had cavities but were smear-negative or other, and 26.7% (2,003 patients) had no cavities but were sputum smear-positive.

Retreatment

In 2023, 425 (4.2%) retreated tuberculosis cases were newly notified. The proportion of retreated patients had been decreasing since peaking at 7.6% in 2010, but in 2023, it increased by 0.4 percentage points from the previous year's 3.8%. The number of retreated patients decreased to 24.1% of the 1,762 cases reported in 2010, nearly a quarter of that figure.

Among the retreated patients, 145 (34.1%) had their previous treatment in 2020 or later. The number of patients whose last treatment year was in 2012 or earlier was 194 (45.6%), indicating that more than 10 years had passed since their last treatment.

Regarding previous treatments for retreated patients, 32.5% (138 patients) had treatment including pyrazinamide (PZA), and 17.6% (75 patients) had treatment including both isoniazid (INH) and rifampicin (RFP). If treatment including PZA also included INH and RFP, it can be concluded that about half of the patients had received standard therapy. The proportion of patients with unknown previous treatment was 27.5% (117 patients), likely due to insufficient interviews or the long interval since their last treatment, making it difficult for patients to recall treatment details.

Complications

Among the 10,096 newly notified tuberculosis patients in 2023, 1,696 (16.8%) had diabetes mellitus, and 7,208 (71.4%) had no complications. The status was unknown for 1,192 patients (11.8%), which likely included those who were not tested for diabetes, those tested but not interviewed, and those interviewed but not recorded.

Among newly notified tuberculosis patients, 650 (6.4%) had known HIV test results. Fourteen (0.1%) tested positive, 636 (6.3%) tested negative, and the proportion of HIV-positive patients among those with

known test results was 2.2%.

Additionally, 3,703 patients (36.7%) had not undergone HIV testing, and 5,743 (56.9%) had an unknown testing status. The untested category likely includes both patients who did not require testing and those who should have been tested but were not.

Similar to diabetes, the "unknown test result" category is thought to include patients who were not actually tested for HIV, those tested but not interviewed, and those interviewed but whose results were not recorded.

Table 3-1 Extrapulmonary cases by site, notified in 2023

Site	Cases	Proportion of Extrapulmonary
Pleura	1,867	46.3%
Other lymph node	597	14.8%
Miliary	526	13.0%
Intestinal	145	3.6%
Peritoneal	128	3.2%
Hilar / Mediastinal lymph node	120	3.0%
Vertebral	101	2.5%
Meninges	90	2.2%
Other joint / Bone	67	1.7%
Cutaneous	61	1.5%
Bronchial	58	1.4%
Pericardial	38	0.9%
Ocular	37	0.9%
Renal / Urinary tract	33	0.8%
Pharyngeal / Laryngeal	29	0.7%
Genital	17	0.4%
Empyema	14	0.3%
Auricular	9	0.2%
Others	96	2.4%
Total	4,033	100.0%

Table 3-2 Newly notified pulmonary tuberculosis patients, by smear and culture test results, 2023

	Culture test results					
	Positive	Negative	Undergoing culture	Aborted (Contamination, etc)	Not done / Unknown	Total
Smear positive	3,216	184	282	4	96	3,782
Smear negative	2,288	1,084	202	4	73	3,651
Smear not done / unknown	11	3	7	0	41	62
Total	5,515	1,271	491	8	210	7,495

Table 3-3 Newly notified pulmonary tuberculosis patients, by smear and NAATs results, 2023

	NAATs			
	Positive	Negative	Not done / Unknown	Total
Smear positive	3,441	55	286	3,782
Smear negative	2,106	956	589	3,651
Smear not done / unknown	19	1	42	62
Total	5,566	1,012	917	7,495

Table 3-4 Newly notified pulmonary tuberculosis patients, by culture and NAATs results, 2023

	NAATs			
	Positive	Negative	Not done / Unknown	Total
Culture positive	4,580	390	545	5,515
Culture negative	490	548	233	1,271
Results pending	367	55	69	491
Test aborted (Contamination, etc)	5	2	1	8
Culture test not done / unknown	124	17	69	210
Total	5,566	1,012	917	7,495

Figure 3-1 Annual trends of newly notified pulmonary tuberculosis cases by culture test results, 2012-2023

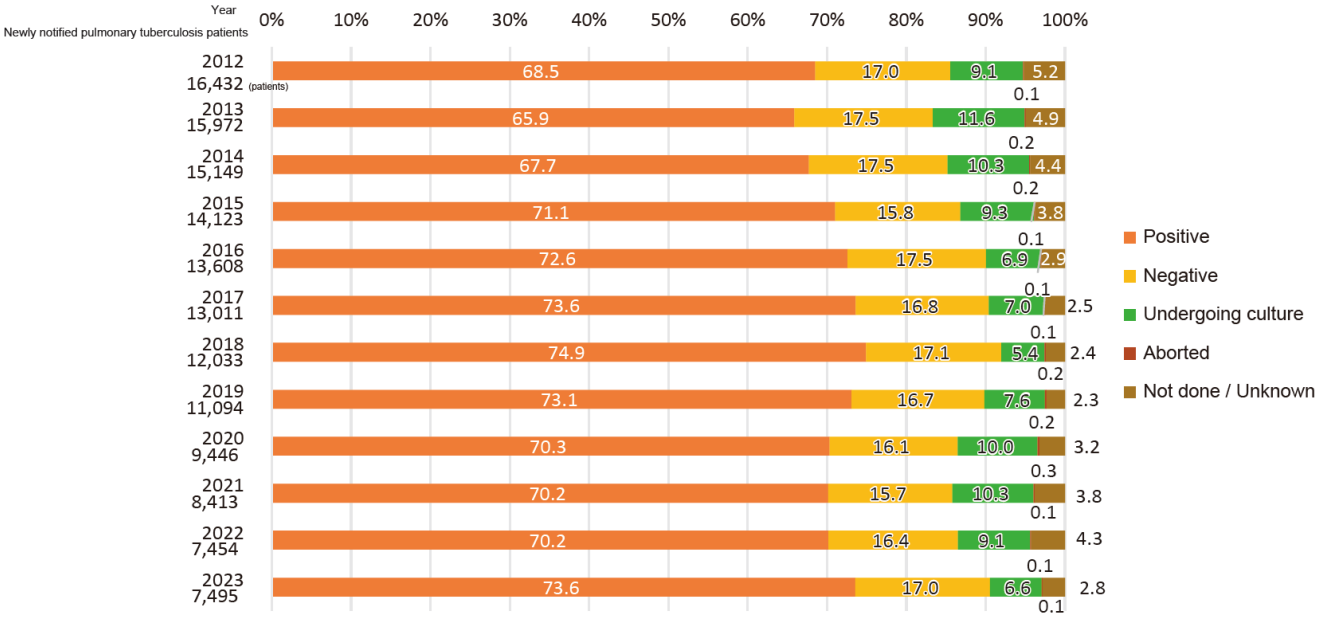
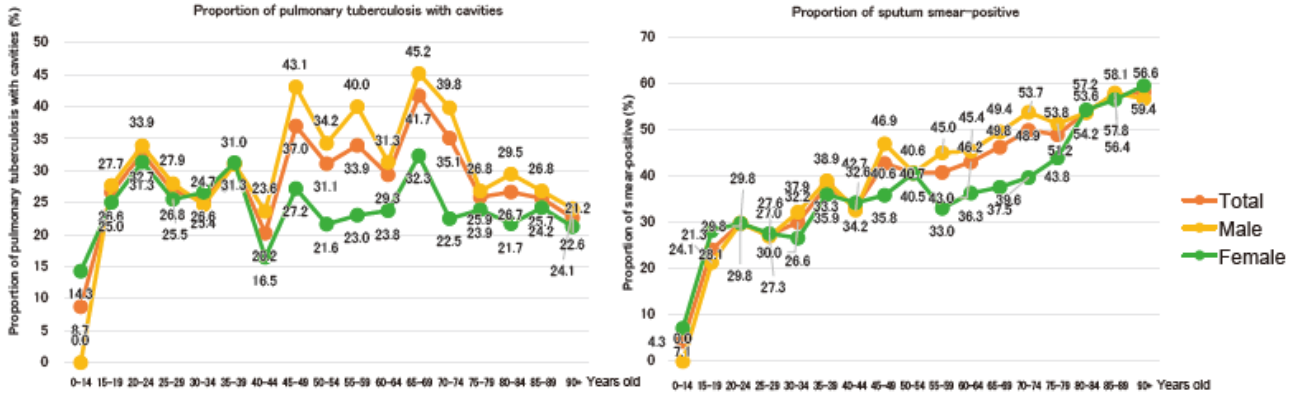


Figure 3-2 Proportion of newly notified pulmonary tuberculosis patients with cavities and positive sputum smear by sex and age groups, 2023



4 Drug Susceptibility

Understanding drug susceptibility

Of the 5,515 newly notified culture-positive PTB patients in 2023, phenotypic drug susceptibility test results to isoniazid (INH) and rifampicin (RFP) were available for 4,526 (82.1%). The proportion of patients with known drug susceptibility results increased from 41.8% in 2007, when data collection began, to 45.7% in 2008, 63.5% in 2009, and 72.9% in 2010, and gradually improved to over 80% from 2017 onward. However, after peaking at 84.0% in 2018, the percentage fell below 80% in 2020 but recovered to 82.1% in 2023 (Figure 4-1).

Patients with unknown test results include those who did not undergo drug susceptibility testing, those whose results were unavailable due to contamination, those with susceptibility results not reported to the health center, and those whose results were reported to the health center but not entered in the tuberculosis registrant information system.

In this surveillance, patients with susceptibility results available for both INH and RFP are considered to have known susceptibility. Those whose susceptibility to INH remains unknown but whose RFP resistance was determined using Xpert MTB/RIF are classified as having unknown susceptibility.

INH and RFP resistance by treatment history

Among the 4,526 newly notified PTB patients with known susceptibility test results in 2023, 254 (5.6%) were INH-resistant, 52 (1.1%) were RFP-resistant, and 35 (0.8%) had resistance to both INH and RFP (MDR).

Among the 4,313 PTB patients* without a previous history of tuberculosis treatment (“new” patients), INH-resistant patients was 5.3% (230 patients), RFP resistance was 1.0% (41 patients), and MDR was 0.6% (26 patients), showing a slight increasing trend in RFP resistance and MDR rates.

Among the 155 PTB patients* with a history of tuberculosis treatment (“retreatment” patients), 12.9% (20 patients) were INH-resistant, 5.8% (9 patients) were RFP-resistant, and 4.5% (7 patients) had MDR, which was higher than that among new patients.

Since 2012, the proportion of INH resistance, RFP resistance, and MDR has shown a gradual increasing trend among new patients, but has fluctuated widely without a constant trend among retreatment patients (Figure 4-2).

*: The remaining 58 patients were with unknown treatment history.

Differences in the proportion of resistant tuberculosis between Japanese-born and foreign-born patients

In 2023, drug susceptibility test results were available for 3,766 (81.9%) of the 4,599 newly notified culture-positive* PTB patients born in Japan. Among them, 177 (4.7%) were INH-resistant, 26 (0.7%) were RFP-resistant, and 16 (0.4%) had MDR. Among the 787 newly notified culture-positive PTB patients* born outside of Japan in 2023, drug susceptibility test results were available for 679 (86.3%). Of these, 69 (10.2%) were INH-resistant, 26 (3.8%) were RFP-resistant, and 19 (2.8%) had MDR, with resistance percentages higher than those of Japanese-born patients.

*: There are 129 other patients whose country of birth is unknown. And the remaining 129 patients were not categorized by the country of birth

INH and RFP resistant tuberculosis by age and by treatment history

Since tuberculosis is more prevalent among the elderly in Japan and more common among young adults with 20–39 years of age in foreign-born patients, we compared the proportion of resistant tuberculosis between Japanese-born and foreign-born patients in the 20–39 age group, categorized by treatment history (Figure 4-3). Among new patients, proportion of resistance tended to be higher among the younger population.

In retreatment cases, resistant tuberculosis was observed across all age groups, with no consistent trend by age. Among the younger age group (20–39 years), Japanese-born new patients had lower proportions of INH, RFP, and MDR resistance than their foreign-born counterparts. However, as shown in Figure 4-4, the differences were not significant.

Although the number of eligible patients was small, INH resistance was higher among Japanese-born retreatment patients (3 out of 11) than among foreign-born retreatment patients (1 out of 10). RFP resistance and MDR were observed only in one foreign-born retreatment patient.

Streptomycin (hereafter “SM”) and Ethambutol (hereafter “EMB”) resistance

Among the 4,313 new patients with drug susceptibility test results to INH and RFP, SM susceptibility results were available for 4,240 patients, of whom 287 (6.8%) were SM-resistant. Among the 155 retreatment patients, SM susceptibility results were available for 154 patients, of whom 14 (9.1%) were SM-resistant.

Among the 4,313 new patients with drug susceptibility test results, EMB susceptibility results were available for 4,295 patients, of whom 57 (1.3%) were EMB-resistant. Among the 155 retreatment patients with susceptibility test results, EMB susceptibility results were available for 155 patients, of whom 6 (3.9%) were EMB-resistant.

Figure 4-1 Trends of the proportion of known drug susceptibility test results to INH and RFP among newly notified culture-positive pulmonary tuberculosis patients, 2007-2023

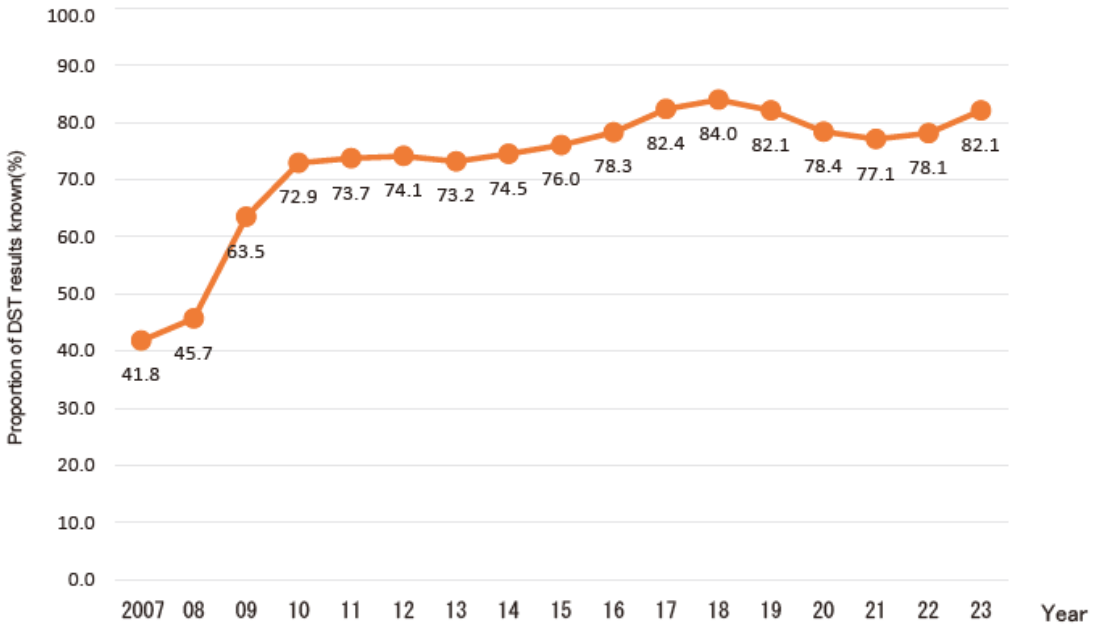


Figure 4-2 Trends in the proportion of drug resistance among newly notified pulmonary tuberculosis patients with known culture-positive drug susceptibility results by treatment history, 2012-2023

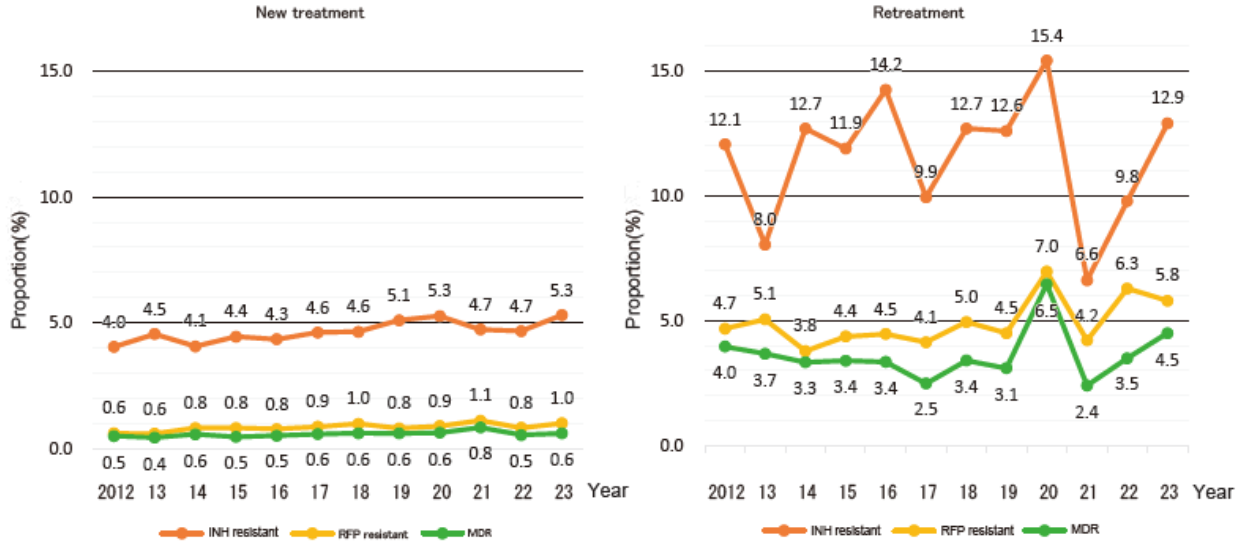


Figure 4-3 Proportion of drug resistance among newly notified Japan-born pulmonary tuberculosis patients with known culture-positive drug susceptibility test results, by treatment history and age groups, 2023

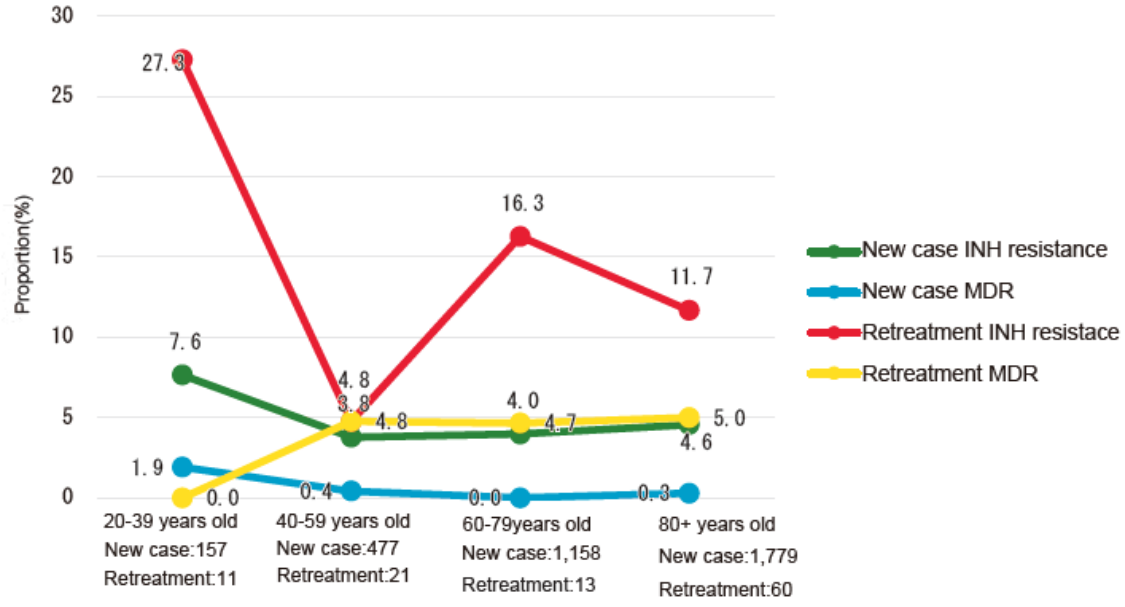
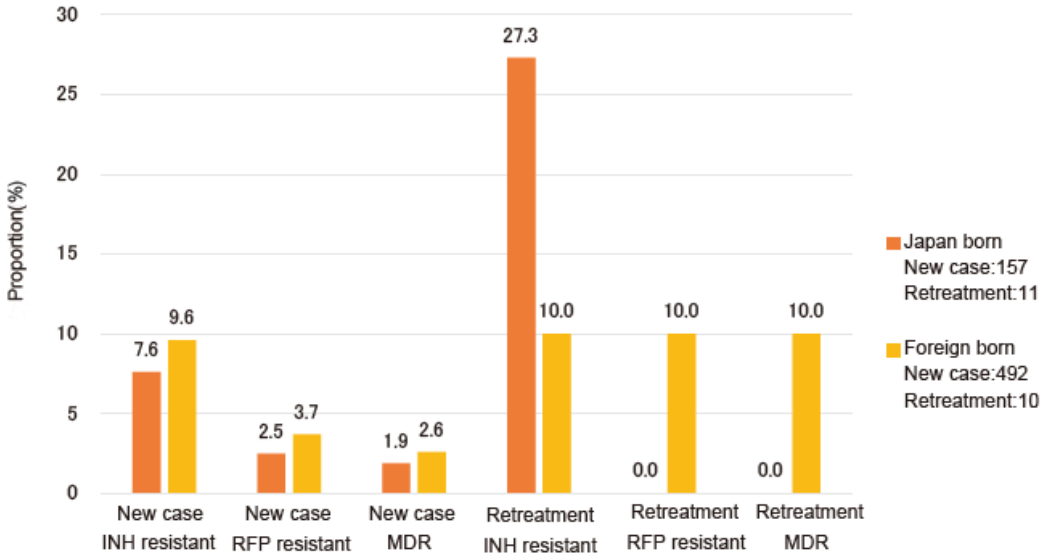


Figure 4-4 Proportion of drug resistance among newly notified pulmonary tuberculosis patients with known culture-positive drug susceptibility results between 20 and 39 years old by treatment history and country of birth, 2023



5. Tuberculosis in Foreign-Born Patients

Annual Trends of Numbers and Proportions by Age Group

Of the 10,096 newly notified tuberculosis cases in 2023, the country of birth was known for 9,825 (97.3%). Among them, 1,619 were foreign-born, an increase of 405 from 1,214 in the previous year. The proportion of foreign-born cases among the total number of newly notified tuberculosis cases including those of unknown country of birth (271 cases) was 16.0%. Excluding cases with unknown birth country, the proportion was 16.5%, an increase from 11.9% in the previous year.

The proportion of foreign-born patients by age group was the highest in the 20–29 age group at 84.8% (884 of 1,042), an increase from 77.5% in the previous year. In the 10–19 age group, foreign-born cases accounted for 69.6% (71 of 102), and in the 30–39 age group, they accounted for 61.6% (334 of 542) (Figure 5-1).

Based on statistics on foreigners residing in Japan as of the end of December 2023 (http://www.moj.go.jp/isa/policies/statistics/toukei_ichiran_touroku.html), the notification rate of tuberculosis among foreign-born individuals in 2023 was 47.5 per 100,000 population, an increase from 41.0 in the previous year, and approximately six times the overall tuberculosis notification rate of 8.1. The tuberculosis notification rate varied significantly by country of birth, with Myanmar-born individuals at 179.1 per 100,000, Indonesia-born individuals at 154.9 per 100,000, Vietnam-born individuals at 48.1 per 100,000, and China-born individuals at 18.0 per 100,000 (Figure 5-2).

Patient Classification

Of the 1,619 newly notified tuberculosis patients of foreign-born in 2023, 1,241 (76.7%) had PTB, while 378 (23.3%) had extra-pulmonary tuberculosis. Among 1,241 PTB patients, 956 patients were bacteriologically confirmed to have *Mycobacterium tuberculosis*, accounting for 77.0% of all PTB cases. The number of sputum smear-positive PTB patients was 390, accounting for 31.4% of all PTB cases. The bacteriologically positive rate of 77.0% among foreign-born PTB patients was 13.5 percentage points lower than the 90.5% (5,489 of 6,063) among Japanese-born PTB patients.

Distribution by Sex and Age Group

Of the 1,619 newly notified tuberculosis patients born abroad in 2023, 839 (51.8%) were male, and 780 (48.2%) were female, showing a slightly higher number of male cases. Among those aged 20–39, male patients outnumbered female patients (20s: 467 males, 417 females; 30s: 177 males, 157 females). However, among those aged 40–69, female patients outnumbered male patients (Figure 5-3).

Compared to Japanese-born newly notified tuberculosis patients, foreign-born patients were more concentrated in younger age groups, with 79.6% (1,289 cases) aged 10–39.

Country of Birth and Occupation

Among the countries of birth, the Philippines had the highest number of tuberculosis cases (317, 19.6% of newly notified tuberculosis cases among foreign-born individuals), followed by Vietnam (272, 16.8%), Indonesia (231, 14.3%), Nepal (229, 14.1%), Myanmar (155, 9.6%), and China (148, 9.1%).

Regarding the annual trend of foreign-born tuberculosis cases, the Philippines and China previously accounted for about half of all cases. However, since 2014, the number of tuberculosis cases among Vietnam-born individuals has increased rapidly, overtaking the Philippines in 2019. Since 2020, the Philippines has again had the highest number of cases. Meanwhile, the number of tuberculosis patients born in Indonesia, Nepal, and Myanmar has been increasing in recent years. The number of newly notified tuberculosis cases from the top six countries with the largest number of foreign-born cases (Philippines, Vietnam, Indonesia, Nepal, Myanmar, and China) was 1,352, accounting for 83.5% of all foreign-born tuberculosis cases (Figure 5-4).

Among the 1,619 newly notified tuberculosis patients born abroad in 2023, the most common occupation was "other full-time workers" (609, 37.6% of all newly notified foreign-born tuberculosis patients), followed by "students above high school age" (344, 21.2%) and "unemployed" (194, 12.0%).

The occupational composition ratio varied significantly by country of birth. For example, among Philippines-born individuals, 41.3% (131 of 317) were "other full-time workers," while only 4.4% (14 of 317) were "students above high school age." In contrast, among Vietnam-born individuals, 58.8% (160 of 272) were "other full-time workers," while 15.4% (42 of 272) were "students above high school age." Among Nepal-born individuals, 11.7% (27 of 229) were "other full-time workers," while 61.5% (141 of 229) were "students above high school age."

Time of Entry into Japan

In the Tuberculosis Surveillance System in Japan, the year of entry has been recorded since 2012.

Among the foreign-born newly notified tuberculosis cases in 2023, 53.1% (668 of 1,259 with a known entry year) were diagnosed within two years of entry, accounting for more than half of the cases. This proportion had significantly decreased to 23.1% in 2021 but exceeded the 2016 level in 2023, reaching the highest proportion in recent years. The proportion of those diagnosed within five years of entry was 70.5% (888 of 1,259), accounting for about 70% of cases (Figure 5-5).

Among the top six countries with the largest number of foreign-born tuberculosis cases in 2023, the proportion of those diagnosed within two years of entry (among cases with a known year of entry) was approximately 50% to 80% for Vietnam-, Indonesia-, Nepal-, and Myanmar-born individuals, whereas it was about 30% for Philippines- and China-born individuals. A substantial proportion (30–40%) of

tuberculosis cases among Philippines- and China-born individuals had been residing in Japan for 11 years or more before being diagnosed with tuberculosis (Figure 5-6).

Figure 5-1 Annual trends in the number of newly notified tuberculosis patients of foreign-born and the proportion of foreign-born tuberculosis patients by age group, 2010-2023

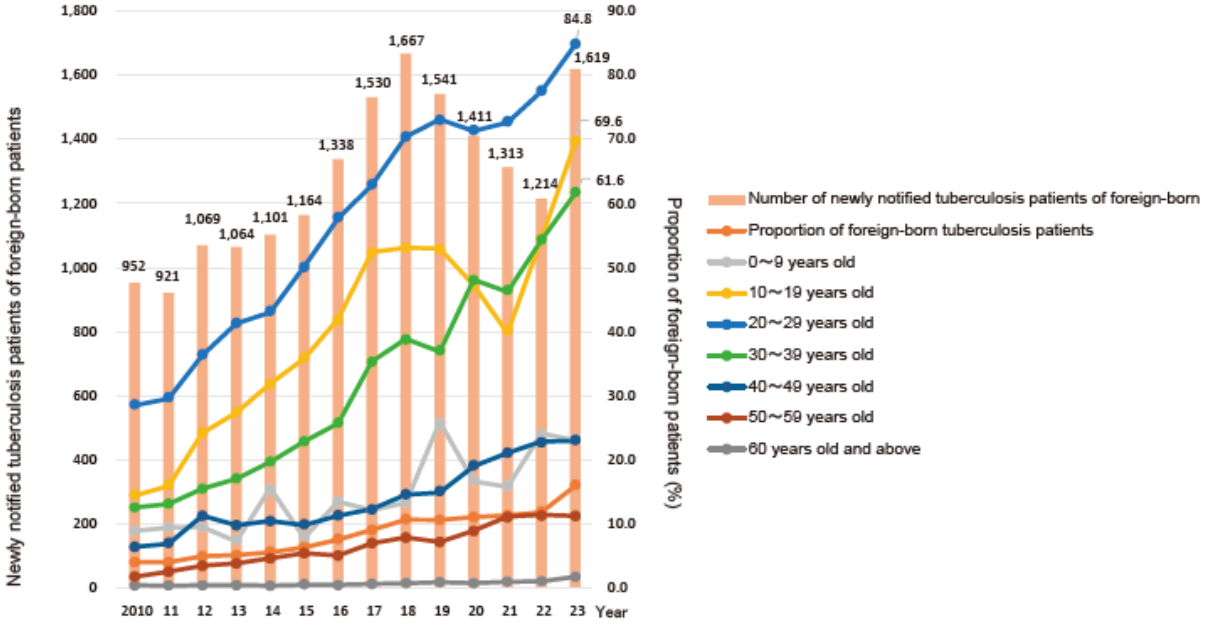


Figure 5-2 The number of newly notified tuberculosis patients in the six most frequent countries, the number of foreign nationals with a residence status* and the notification rate of newly notified tuberculosis paients by country of birth, 2023

* Number of foreign residents by nationality at the end of 2023

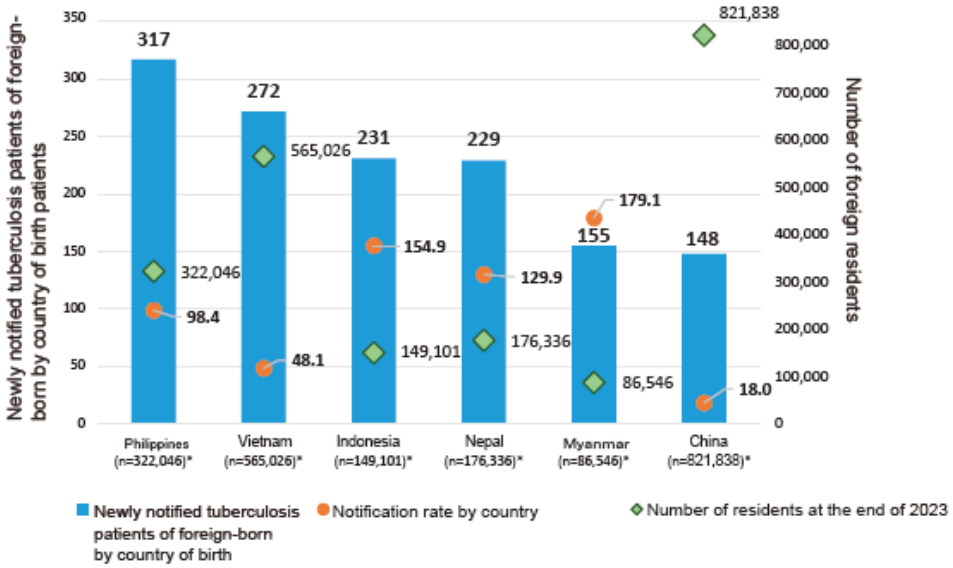


Figure 5-3 Distribution of newly notified tuberculosis patients of foreign-born by sex and age group, 2023

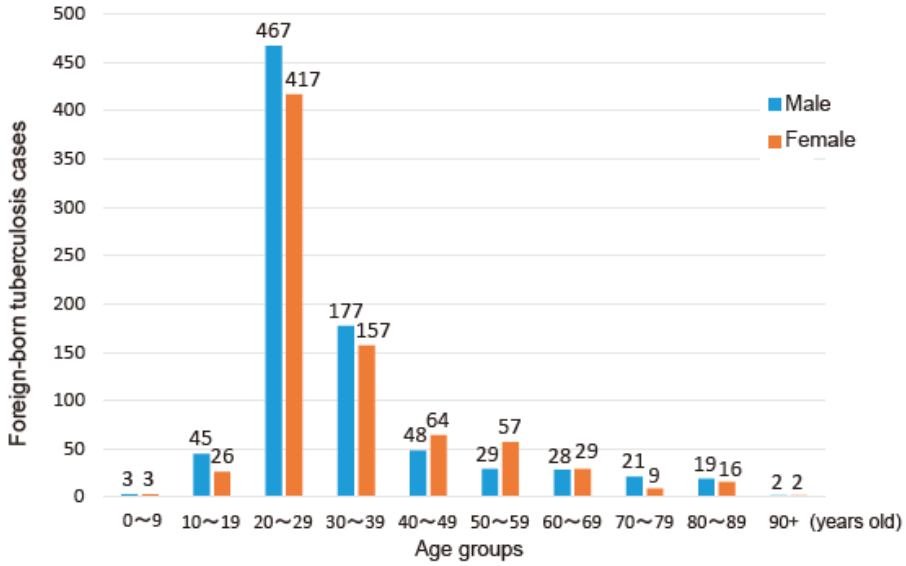


Figure 5-4 Annual trends in the number of newly notified tuberculosis patients of foreign-born in most six frequent countries, 2010-2023

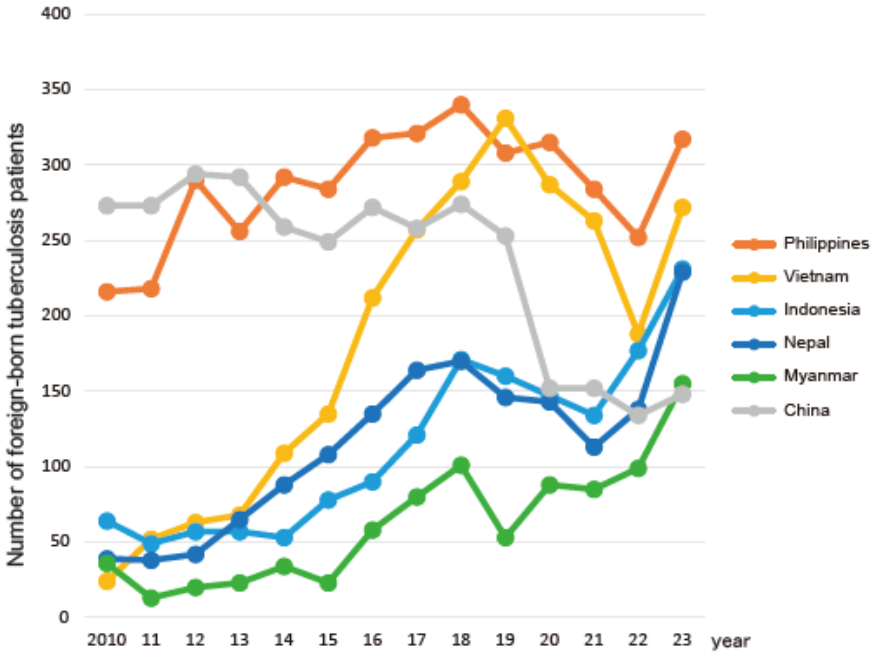


Figure 5-5 Annual trends in the proportion of timing of diagnosis from entry to Japan tuberculosis among newly notified tuberculosis patients of foreign-born, 2012 - 2023

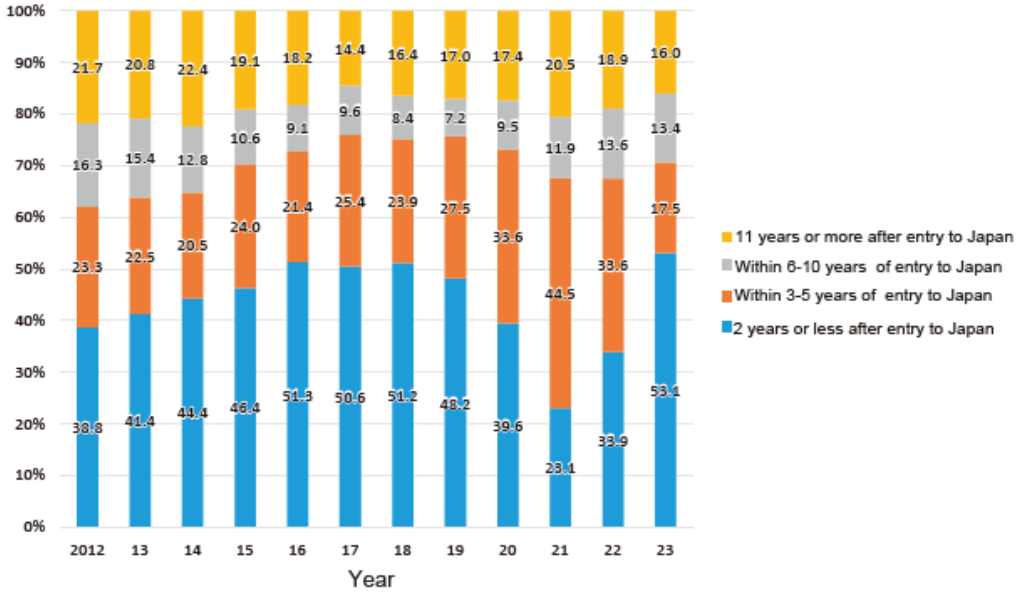
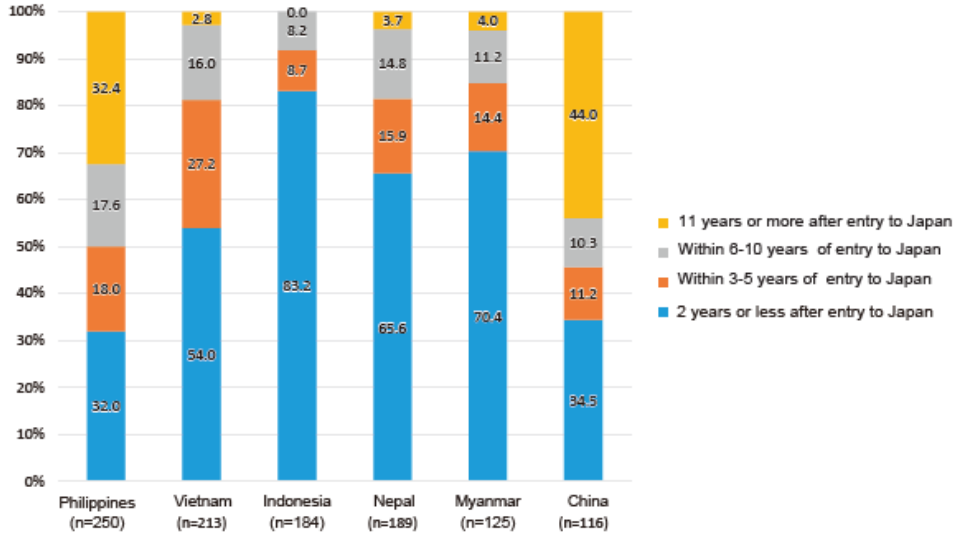


Figure 5-6 Timing of diagnosis from entry to Japan among newly notified tuberculosis patients in 2023 by country of birth, year of entry known



6 Social Attributes of Newly Notified Tuberculosis Patients

Occupation

The occupational categories of the 10,096 newly notified tuberculosis patients in 2023 are shown in Table 6-1. The largest group was unemployed, with 6,335 (62.7%) patients across all ages, as many elderly patients were classified as unemployed. This was followed by 1,560 (15.5%) other full-time workers.

Among the 3,356 newly notified tuberculosis patients aged 64 years and younger, 1,333 (39.7%) were other full-time workers, the most significant category. The number of medical-related occupations, including nurses, physicians, and other health care workers totaled 276 (8.3%), with other health care workers accounting for 188 (5.6%). The number of unemployed patients was 450 (13.4%) among those aged 64 years and younger. Elementary and junior high school students and above accounted for 397 (11.8%), of whom 350 (88.2%) were foreign-born patients.

Type of health insurance at the time of notification

Table 6-2 shows the types of insurance at the time of notification for the 10,096 newly notified tuberculosis patients. Since many newly notified tuberculosis patients were elderly, 66.8% (6,757 patients) were covered by the Medical insurance program for older senior citizens and National Health Insurance. Patients receiving or applying for public assistance together accounted for 6.3% (639 patients), a higher percentage compared to the national welfare coverage rate of 1.62% in 2022 (Survey on the number of people protected by public aid, Ministry of Health, Labor and Welfare, approximate number for December 2022).

Socially and economically deprived

Table 6-3 summarizes the newly notified tuberculosis patients aged between 25 and 64 years who had socioeconomic deprivation factors. Here, homelessness experience, unemployment, receiving public assistance, and applying for public assistance were considered factors contributing to socioeconomic deprivation.

Compared to the overall proportion of patients aged 25 to 64 years, more males had experienced homelessness, were recipients of public assistance, and were applying for public assistance, while the proportion of unemployed patients was similar to that of the overall group. About age, the older the patients, the higher the proportion of those with factors contributing to socioeconomic deprivation. The proportion of patients with socioeconomic deprivation was higher among Japanese-born patients than among foreign-born patients.

Among 2,707 newly notified tuberculosis patients aged 25 to 64 years, 2,368 (87.5%) had none of the above socioeconomic deprivation factors, 324 (12.0%) had only one, 15 (0.6%) had two, and none (0.0%) had all three factors simultaneously.

Table 6-1 Number of newly notified tuberculosis patients by occupation, 2023

All ages

Occupation	Newly notified patients	%
Service industry	244	2.4
Nurses	91	0.9
Physician	24	0.2
Other health care workers	204	2
Teacher and Childcare worker	40	0.4
Elementary and junior high school students	17	0.2
High school and university students	380	3.8
Other full-time workers	1,560	15.5
Other temporary workers	264	2.6
Other self-employed	382	3.8
Houseworkers	63	0.6
Nursery school and kindergarten children	6	0.1
Other infants	16	0.2
Unemployed	6,335	62.7
Others	254	2.5
Unknown	216	2.1

Under 64 years old

Occupation	Newly notified patients	%
Service industry	193	5.8
Nurses	79	2.4
Physician	9	0.3
Other health care workers	188	5.6
Teacher and Childcare worker	34	1
Elementary and junior high school students	17	0.5
High school and university students	380	11.3
Other full-time workers	1,333	39.7
Other temporary workers	166	4.9
Other self-employed	174	5.2
Houseworkers	25	0.7
Nursery school and kindergarten children	6	0.2
Other infants	16	0.5
Unemployed	450	13.4
Others	199	5.9
Unknown	87	2.6

Table 6-2 Number of newly notified tuberculosis patients by type of insurance at the time of notification, 2023

Type of insurance	Newly notified patients	%
Employee himself/herself	2,031	20.1
Employee's family	313	3.1
National health insurance	1,666	16.5
National health insurance for retired person	18	0.2
National health insurance for retired person's family	5	0
Medical insurance program for older senior citizens	5,058	50.1
Public assistance(receiving)	620	6.1
Public assistance(pending)	19	0.2
Other	118	1.2
Unknown	248	2.5
Total	10,096	100.0%

Table 6-3 Newly notified tuberculosis patients aged 25-64 years with socioeconomic deprivation factors by sex, age groups and country of birth, 2023

		25-64 years old newly notified tuberculosis patients		Homeless experienced		Unemployed		Public assistance (receiving)		Public assistance (pending)	
		number of patients	%	number of patients	%	number of patients	%	number of patients	%	number of patients	%
Total		2,707		25		430		144		8	
Sex	Male	1,613	59.6	23	92.0	249	57.9	116	80.6	8	100.0
	Female	1,094	40.4	2	8.0	181	42.1	28	19.4	0	0.0
Age group	25-34	836	30.9	4	16.0	43	10.0	5	3.5	0	0.0
	35-44	450	16.6	6	24.0	61	14.2	8	5.6	0	0.0
	45-55	650	24.0	6	24.0	110	25.6	50	34.7	3	37.5
	55-64	771	28.5	9	36.0	216	50.2	81	56.2	5	62.5
Country of birth											
	Japan-born	1,665	61.5	19	76.0	312	72.6	126	87.5	8	100.0
	Foreign-born	982	36.3	5	20.0	102	23.7	12	8.3	0	0.0
	COB unknown	60	2.2	1	4.0	16	3.7	6	4.2	0	0.0

7 Case finding

Bacteriological test results and symptoms at diagnosis

Of the 7,495 newly notified PTB patients in 2023, 3,524 (47.0%) were sputum smear-positive. Of these, 3,374 (45.0%) were never previously treated, and 150 (2.0%) were retreated. In addition, 3,093 (41.3%) were tested positive for *Mycobacterium tuberculosis* (smear-positive from other specimens than sputum, smear-negative culture-positive, or NAA positive from sputum samples). Thus, a total of 6,617 (88.3%) patients were bacteriologically confirmed (Figure 7-1).

Regarding symptoms at diagnosis among the 7,495 newly notified PTB patients, 1,888 (25.2%) had only respiratory symptoms such as cough, whereas 2,141 (28.6%) had both respiratory and non-respiratory symptoms. Therefore, 4,029 (53.8%), had respiratory symptoms. Patients detected with any symptoms, including non-respiratory symptoms, totaled 5,408 (72.2%).

Delays in detection by symptom presence

Figure 7-2 shows the total delay in diagnosis among 5,408 symptomatic patients with newly notified PTB in 2023, categorized by Japanese-born and foreign-born patients. A patient delay is defined as the time from the onset of symptoms to the patient's initial visit to a health facility, whereas a health provider's delay is defined as the time from the initial visit to a health facility until the patient is finally diagnosed with tuberculosis. A total delay in diagnosis is defined as the sum of the patient's delay and the health provider's delay. Percentages of each period of delay are calculated by excluding those with unknown durations of delays from the denominator.

Among 4,577 symptomatic patients* with PTB who were Japanese-born*, 2444 (53.4%) had a patient delay of less than 2 weeks, whereas 719 (15.7%) had a delay between 2 weeks and 1 month. Regarding the health provider's delay, 2792 (61.0%) of the cases experienced a delay of less than 2 weeks, indicating that the provider's delay is generally short. Overall, 1117 (24.4%) cases had a total delay in diagnosis within 2 weeks, 22.3% between 2 weeks and 1 month, and 1021 (21.2%) between 1 and 2 months.

A similar finding was observed among foreign-born patients; however, patient's delays were slightly longer than those of Japanese-born patients. Among 679 symptomatic patients with PTB who were foreign-born*, 299 (44.1%) had a patient delay of less than 2 weeks, whereas 124 (18.3%) had a delay of between 2 weeks and 1 month. Regarding health provider's delay, 123; (18.1%) of foreign-born cases were diagnosed within 2 weeks, 147 (21.6%) between 2 weeks and 1 month, and 145 (21.4%) between 1 and 2 months.

(*: There are 152 symptomatic patients with PTB whose country of birth is unknown.)

The percentage of the patient's delay within 1 month was 69.1% for Japanese-born patients, larger by 6.7%, compared to 62.4% for foreign-born patients. On the other hand, the majority (61.7%) of foreign-born patients were diagnosed as tuberculosis by the health provider within 2 weeks, similar to Japanese-born patients, indicating that the health provider's delays were generally short.

Mode of detection

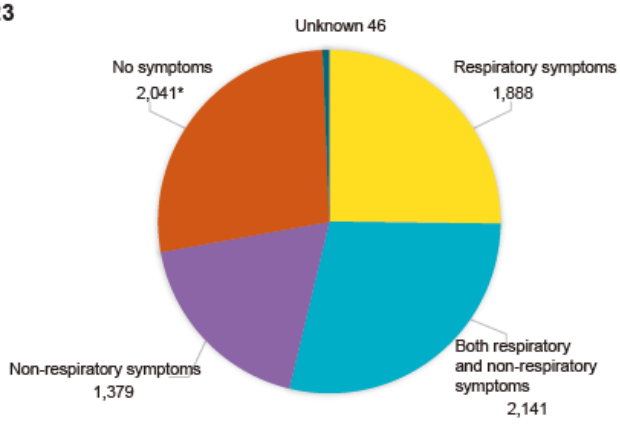
Figure 7-3 shows the mode of detection of newly notified patients with tuberculosis in 2023, categorized by Japanese-born (8,206 patients) and foreign-born (1,619 patients) cohorts*.

Among the Japanese-born patients, 920 (11.2%) were detected through health examinations (individual checkups, periodic checkups, contact investigations, other group checkups, and occupational health screenings), whereas 7,185 (87.6%) were detected through medical consultations, the majority. In particular, 4,455 (54.3%) had symptoms and thus they sought health care.

Among the foreign-born patients, 658 (40.6%) were detected through health examinations, far exceeding the proportion of Japanese-born patients. In particular, 493 (30.5%) were detected through periodic health examinations, accounting for the majority of health examination findings, highlighting the importance of periodic health examinations in detecting foreign-born patients with tuberculosis. Medical consultations accounted for 938 (57.9%) foreign-born patients, with symptomatic cases detected during medical consultations accounting for 829 (51.2%). Detections during hospitalization for other diseases (39, 2.4%) and during outpatient treatment for other diseases (70, 4.3%) were less common.

(*: There are 271 patients whose country of birth is unknown.)

Figure 7-1 Distribution of symptoms upon diagnosis for newly notified patients with pulmonary tuberculosis, 2023



Respiratory symptoms: cough, sputum production, bloody sputum, cough up blood.
Other symptoms: wheezing, chest pain, back pain, shortness of breath, fever, night sweats, generalized fatigue, and weight loss.
*No symptoms includes the cases that were detected during the health check.

Figure 7-2 Proportion of delay in seeking health care among symptomatic patients with newly notified pulmonary tuberculosis, by delay category and by country of birth, 2023

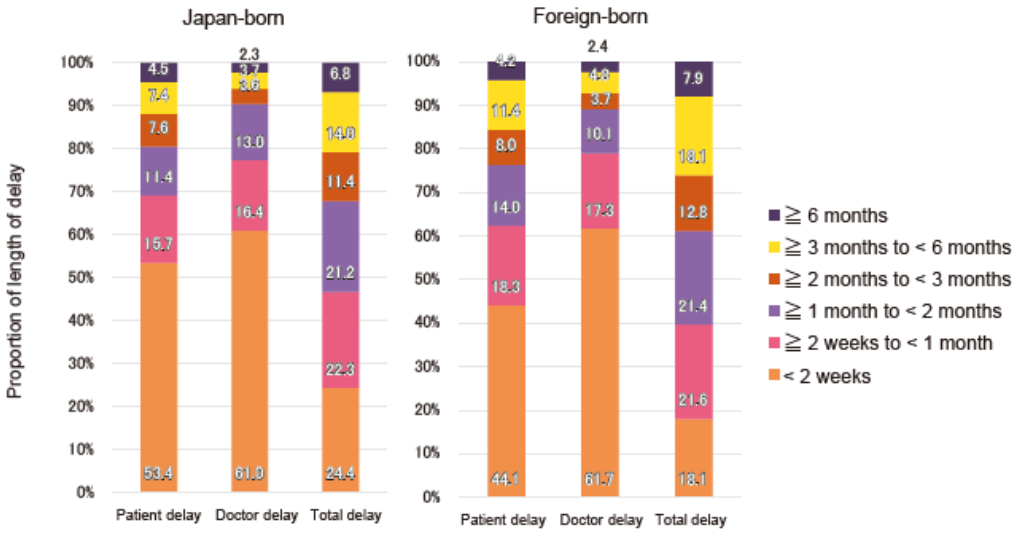


Figure 7-3 Modes of case detection for all newly notified patients with tuberculosis by country of birth, 2023

8 Latent Tuberculosis Infection

Trends Over Time, by Country of Birth, by Age Group

The number of newly notified patients requiring treatment for latent tuberculosis infection (LTBI) in 2023 was 5,033. The number of new notifications remained at about 7,000 per year from 2013 until 2019, but it dropped to 5,575 in 2020 and has remained at approximately 5,000 since 2021 (Figure 8-1).

In 2023, there were 911 foreign-born patients, a substantial increase of 42.1% from 641 in the previous year. On the other hand, the number of Japanese-born patients was 4,002, a decrease of 5.1% from 4,217 in the previous year. The proportion of foreign-born patients (including those with an unknown country of birth in the denominator) among those requiring treatment for LTBI had been increasing since 2012, peaking at 13.0% in 2018, then showed a downward trend after 2019. However, in 2022, it rose to 12.8%, and in 2023, it further increased to 18.1% (911 out of 5,033), marking the highest proportion ever recorded (Figure 8-1).

Figure 8-2 shows the trends in the number of newly notified patients requiring treatment for LTBI by age group from 2014 to 2023. The number of new notifications among those aged 60 and older increased annually, reaching 3,247 in 2019, but has since declined each year. In 2023, it decreased by 128 from 2022 to 2,481 (Figure 8-2). On the other hand, while the number of patients in other age groups has been declining in recent years, the number of those aged 0–19 has been increasing since 2022, and the number of those aged 20–39 has been increasing since 2023. Among those aged 40–59, the decline continued, with 1,070 cases in 2023, a decrease of 118 from 2022 (Figure 8-2).

The number of newly notified patients requiring treatment for LTBI by age group in 2023 showed a small peak in those younger than 10 years and a larger peak in those aged 70–79 among the Japanese-born. On the other hand, among the foreign-born, the largest peak was observed in the 20–29 age group, where the number of newly notified cases exceeded that of the Japanese-born (Figure 8-3).

Modes of Detection

Figure 8-4 shows the modes of detection by country of birth for the 5,033 newly notified patients requiring treatment for LTBI in 2023 (4,002 born in Japan, 911 foreign-born, and 120 with an unknown country of birth).

Among those born in Japan, the most common mode of detection was at medical institutions while attending hospitals for other diseases, accounting for 977 patients (24.4% of newly notified patients requiring treatment for LTBI). The number of patients detected through contact investigation was 587 (14.7%) for family contacts and 1,023 (25.6%) for extra-familial contacts, totalling 1,610 (40.2%) for both (Figure 8-4).

Among the foreign-born, the most common detection method was extra-familial contact investigation, accounting for 461 patients (50.6%). The number of patients detected through both family and extra-

familial contact screening was 553, making up 60.7% of cases, meaning that more than 60% of cases were detected through contact investigation (Figure 8-4).

Occupation at the Time of Registration

Figure 8-5 shows the main occupation categories by country of birth among patients requiring treatment for LTBI registered in 2023.

Among the Japanese-born (4,002 patients), 1,893 (47.3%) were categorized as "unemployed or other."

Among the foreign-born (911 patients), the most common occupation category was "other full-time workers*" with 300 patients (32.9%), followed by "high school students and university students" with 266 patients (29.2%) (Figure 8-5).

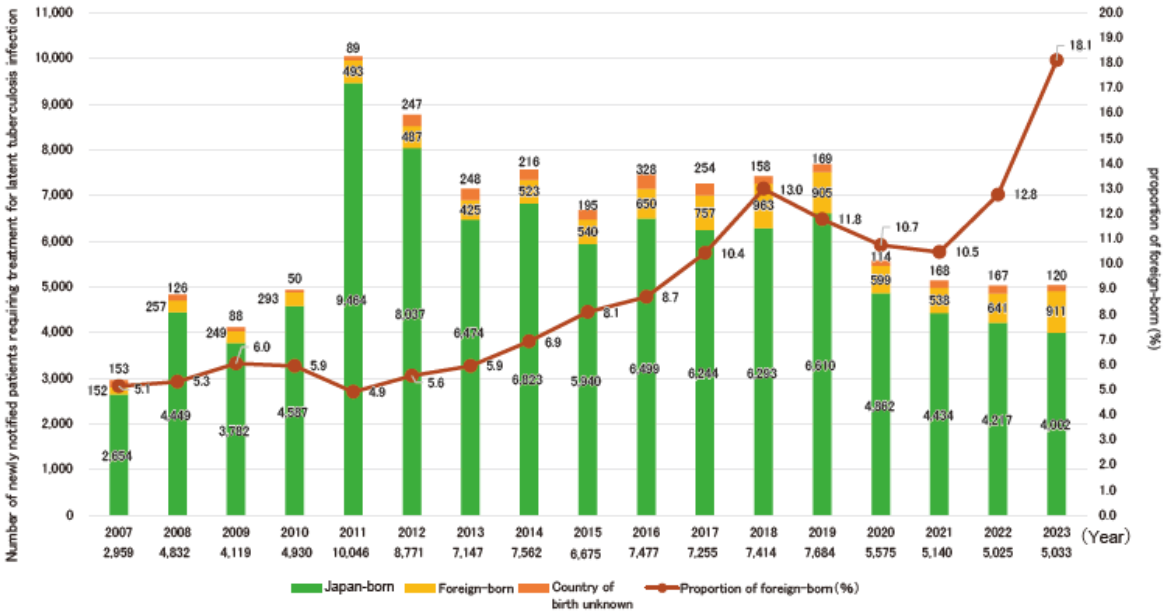
* "Other full-time workers" refers to regular employees other than those engaged in customer service, healthcare, teaching, or childcare.

Treatment Outcomes

Figure 8-6 shows the treatment outcomes at the end of 2023 for 4,969 patients with LTBI requiring treatment who started treatment in 2022 (4,195 Japanese-born, 633 foreign-born, and 141 with an unknown country of birth).

The treatment completion rate was 85.0% (4,222 patients) overall, 84.8% (3,557 patients) among the Japanese-born, and 87.4% (553 patients) among the foreign-born, with the completion rate exceeding 85% for the foreign-born. The lost-to-follow-up rate was 7.3% (306 patients) among the Japanese-born and 4.6% (29 patients) among the foreign-born, with the foreign-born having a lower rate. On the other hand, the transfer-out rate among the foreign-born was 4.3% (27 patients), which was higher than that of the Japanese-born at 0.5% (21 patients) (Figure 8-6).

Figure 8-1 Annual trends in the number of newly notified patients requiring treatment for latent tuberculosis infection and the proportion* of foreign-born among those, by country of birth, 2007-2003



*The total number includes those for whom the country of birth is unknown.

Figure 8-2 Trends in the number of newly notified patients requiring treatment for latent tuberculosis infection by age group, 2014-2023

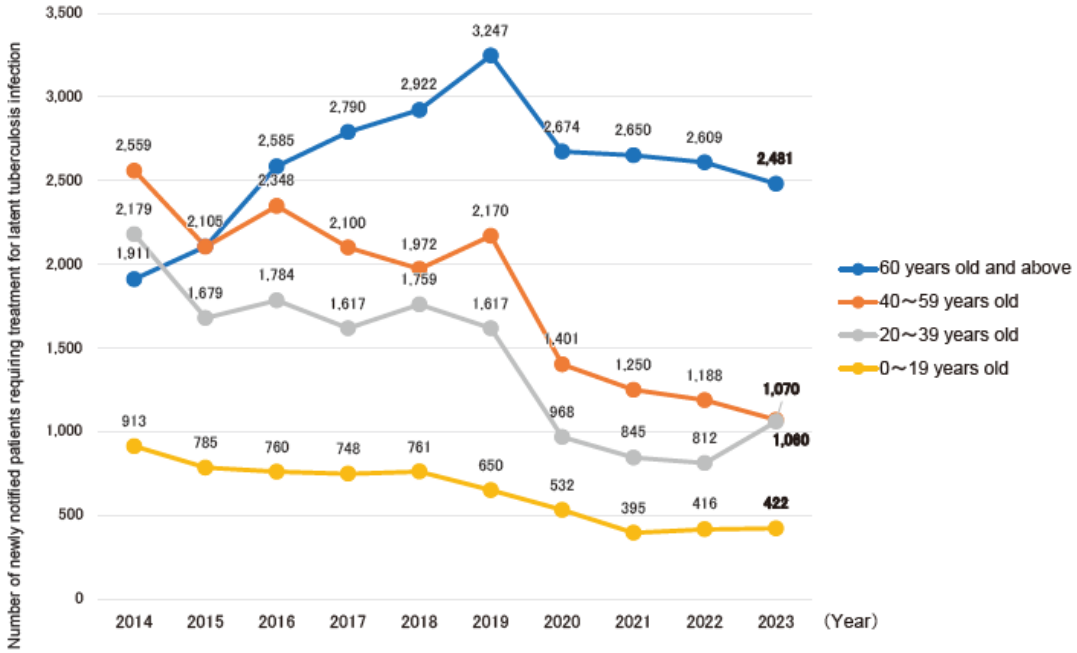


Figure 8-3 Number of newly notified patients requiring treatment for latent tuberculosis infection by country of birth and age groups, 2023

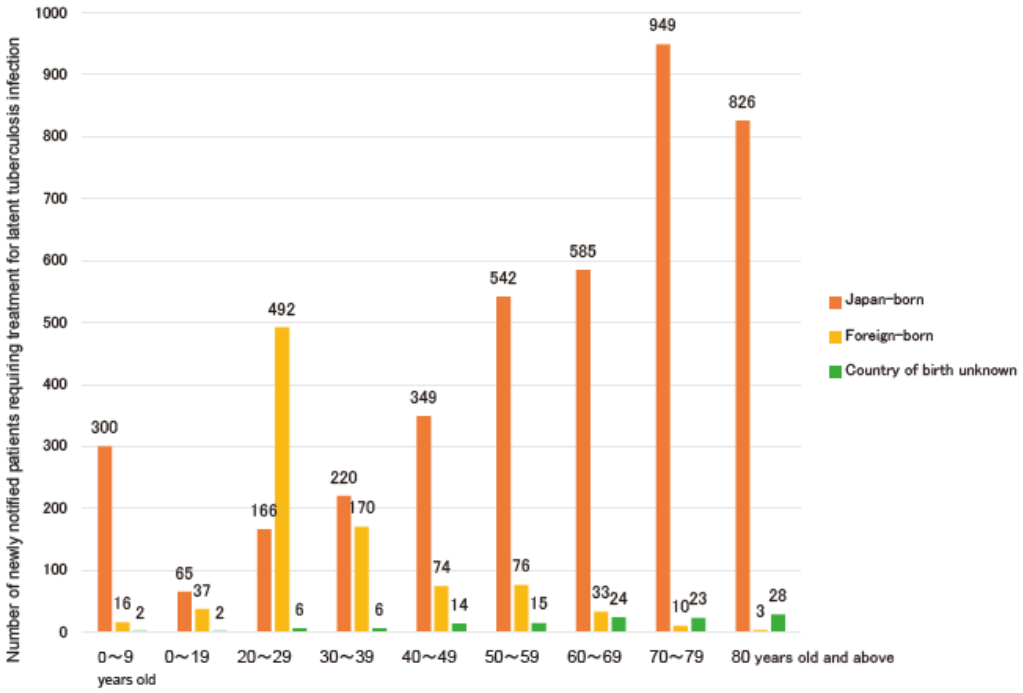


Figure 8-4 Number of newly notified patients requiring treatment for latent tuberculosis infection by country of birth and modes of detection, 2023

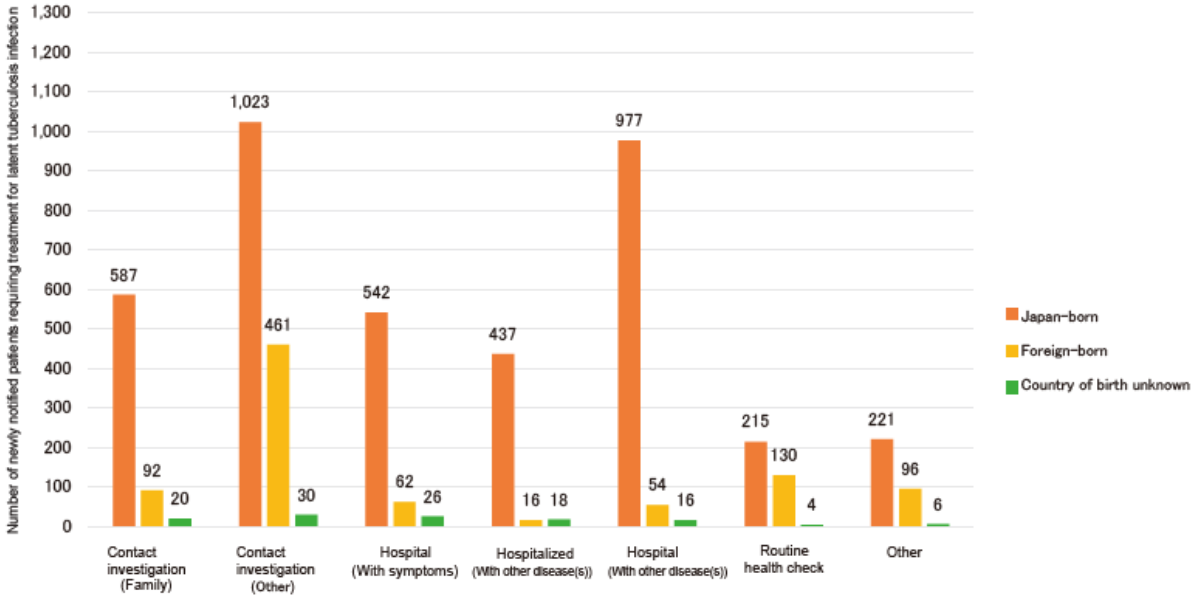
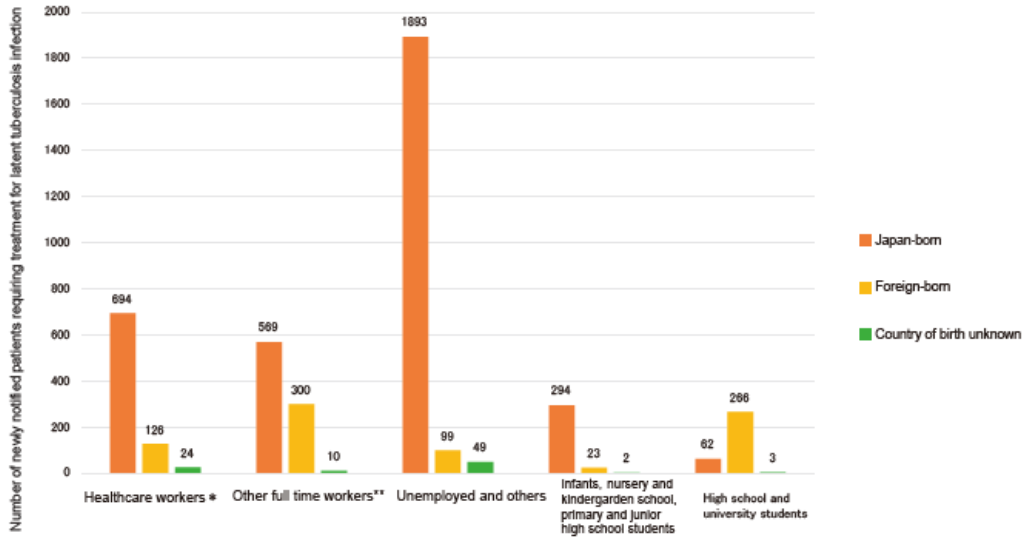
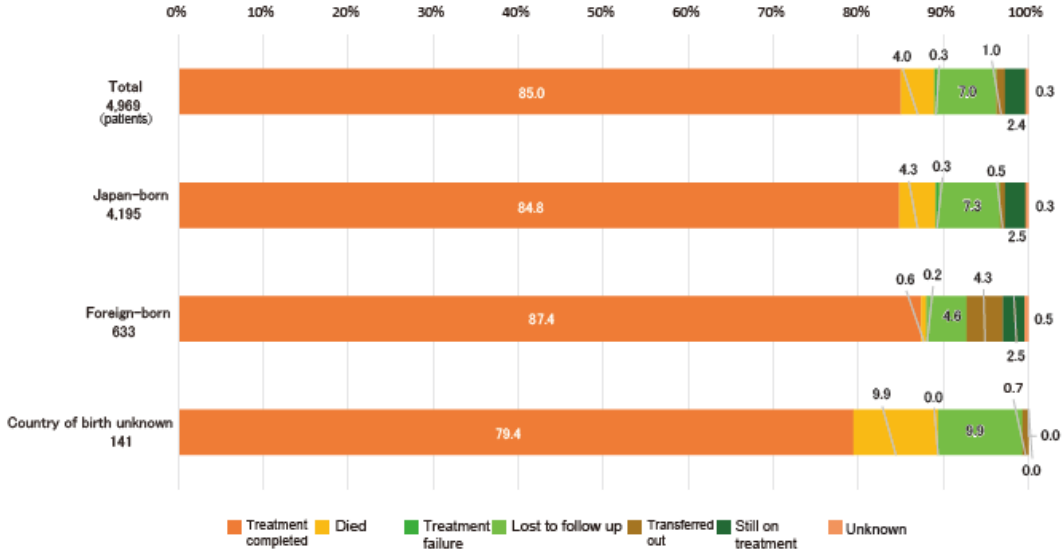


Figure 8-5 Number of newly notified patients requiring treatment for latent tuberculosis infection by country of birth and occupation, 2023



＊Nurses, public health nurses, physicians, other medical professionals
**Full-time workers other than service industry, healthcare workers, teachers and childcare workers.

Figure 8-6 Treatment outcomes of patients requiring treatment for latent tuberculosis infection notified in 2022, the end of 2023



9 Medical Treatment

Drugs at the Start of Treatment

The only information on treatment obtained from the Japan TB Surveillance system is the choice of drug at the start of treatment, i.e., which drugs were used to start treatment. The actual treatment, which is subject to change due to adverse events during treatment and drug sensitivity identified during treatment, is not captured in the Japan TB Surveillance system.

Among 10,096 newly notified tuberculosis patients in 2023, as drug of choice at the start of treatment, 6,342 (62.8%) were on 4-drug combination therapy including INH, RFP, PZA plus EB or SM, 170 (1.7%) on 3 or more drugs including INH, RFP, and PZA, and 2,726 (27.0%) on 3 or more drugs including INH and RFP without PZA. The proportion of patients treated with 4-drug combination therapy, including EB or SM, in addition to INH, RFP, and PZA, has remained around 60% since 2012, with no significant changes.

As age increased, the proportion of cases that were treated with PZA trended downward (Figure 9-1).

The proportion of patients treated with three or more drugs, including PZA, was 86.4% (4,980 of 5,767) among those 79 years old and younger and was lower among those 80 years old and older, with 35.4% (1,532 of 4,329). However, the proportion was less than 20% until 2017 and has increased since 2018. (Figure 9-2)

However, there were significant regional differences in the proportion of patients treated with three or more drugs, including PZA, even among those 79 years and younger. Figure 9-3 shows this proportion by prefectures. The highest rate was 100.0% in Fukui Prefecture, while the lowest rate was 61.9% in Shimane Prefecture, a gap of 38.1 percentage points.

Duration of Hospitalization

The duration of hospitalization for tuberculosis is stipulated in the "Handling of Admission, Discharge, and Restriction of Employment for Tuberculosis Patients" under Infectious Disease Control Law and is not uniform because it depends on the results of sputum smear and culture tests and the status of the local medication adherence system.

Figure 9-4 shows the distribution of hospital stays for 3,686 newly notified tuberculosis patients who started inpatient treatment and later discharged in 2022. The distribution of hospital stays tends to be longer for sputum smear-positive cases and shorter for smear-negative cases and extra-pulmonary tuberculosis cases.

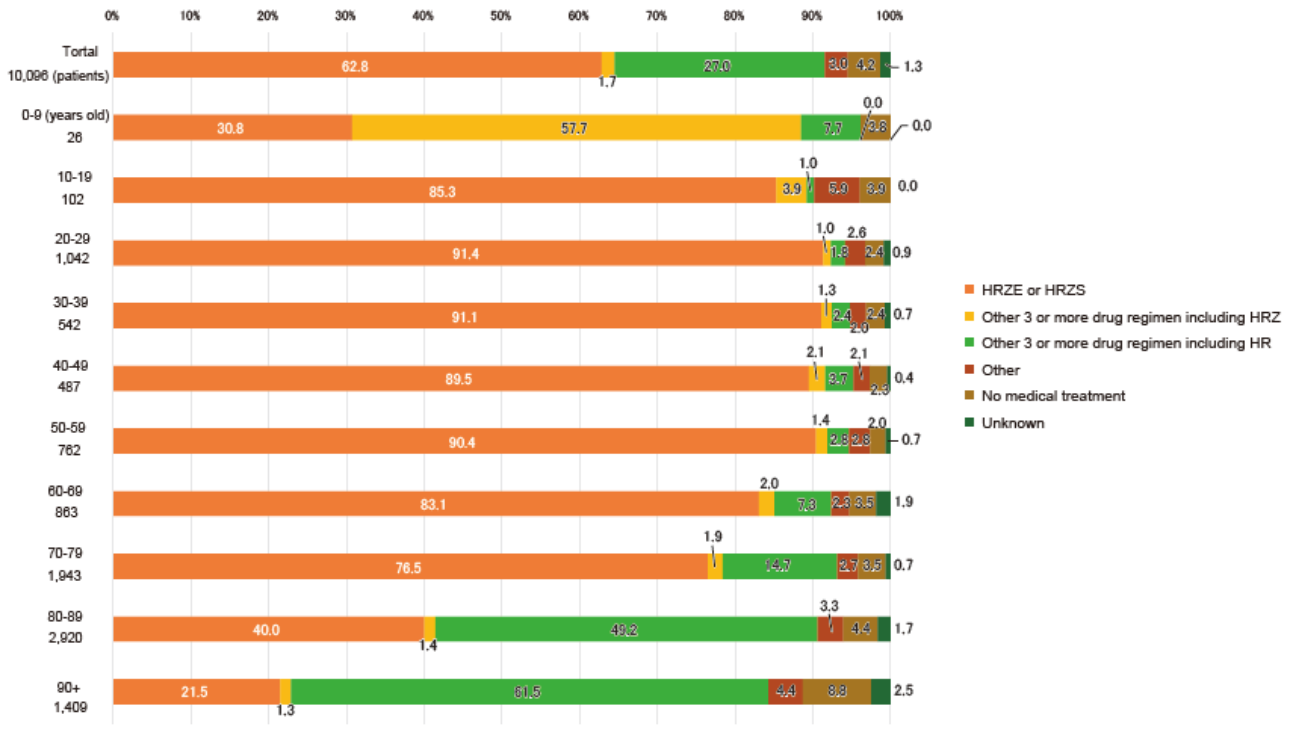
The median length of hospital stays for PTB patients who started inpatient treatment was 68 days for those notified in 2009, gradually shortened until 2015, and remained almost stable since then, with 63 days for those notified in 2022. (Figure 9-5)

Figure 9-6 shows the median number of hospitalized days among newly notified PTB patients who started inpatient treatment in 2022 by Prefecture. The median number of hospitalization days varied widely among Prefectures, ranging from 30.5 days in Toyama Prefecture, the shortest, to 102 days in Yamagata Prefecture, the longest. The prefectures with the longest hospital stays last year tended to have long hospital stays this year as well, reflecting differences not only in the conditions of patients but also in the healthcare providers.

Duration of Treatment

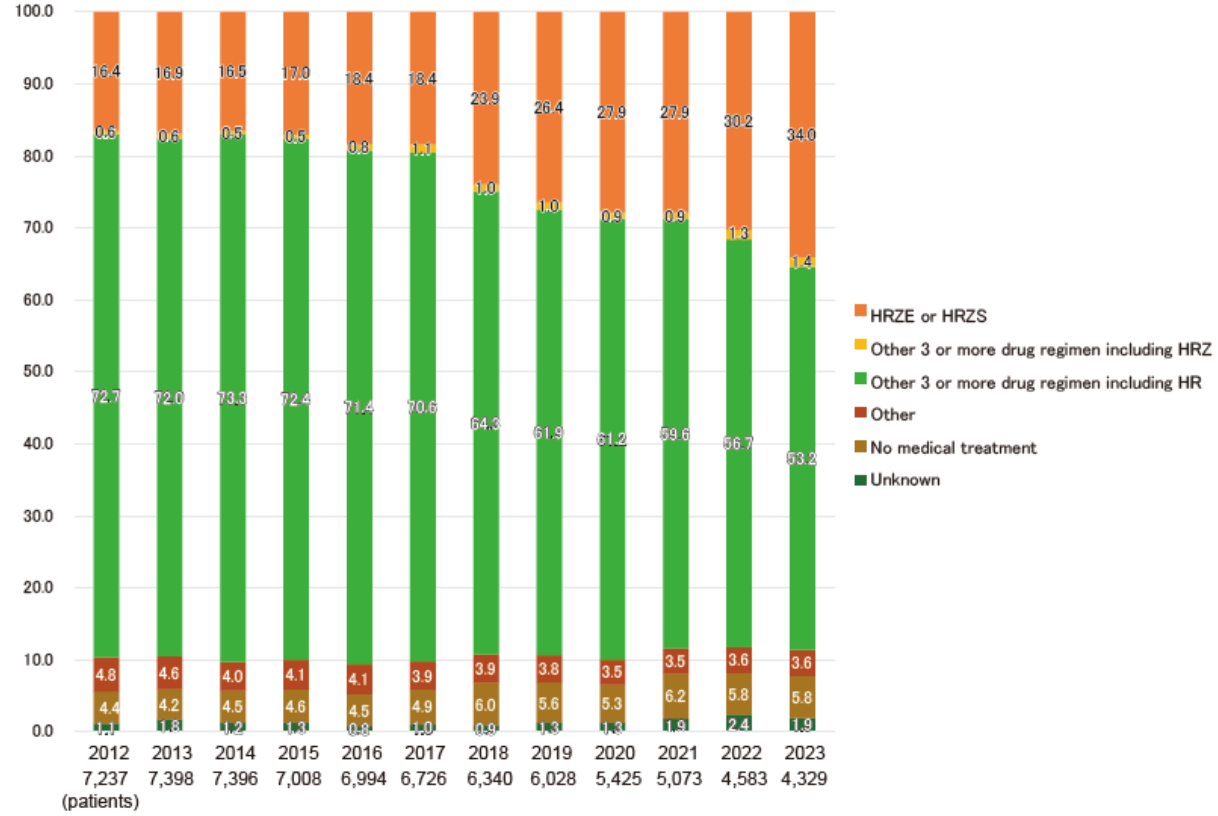
The number of days of treatment is determined by the choice of drugs according to the guidelines for tuberculosis treatment., The standard treatment regimen is 180 days or more. Figure 9-7 shows the distribution of treatment duration by activity category for newly notified tuberculosis patients in 2022 who were successfully treated (treatment outcome was cured or completed) and for whom the duration of treatment was known. The distribution of treatment duration tended to be longer in sputum smear-positive patients and particularly in sputum smear-positive patients who were retreated. Since 2016, there have been fluctuations in treatment duration but no consistent trend.

Figure 9-1 Proportion of treatment regimen upon notification by age groups, 2023



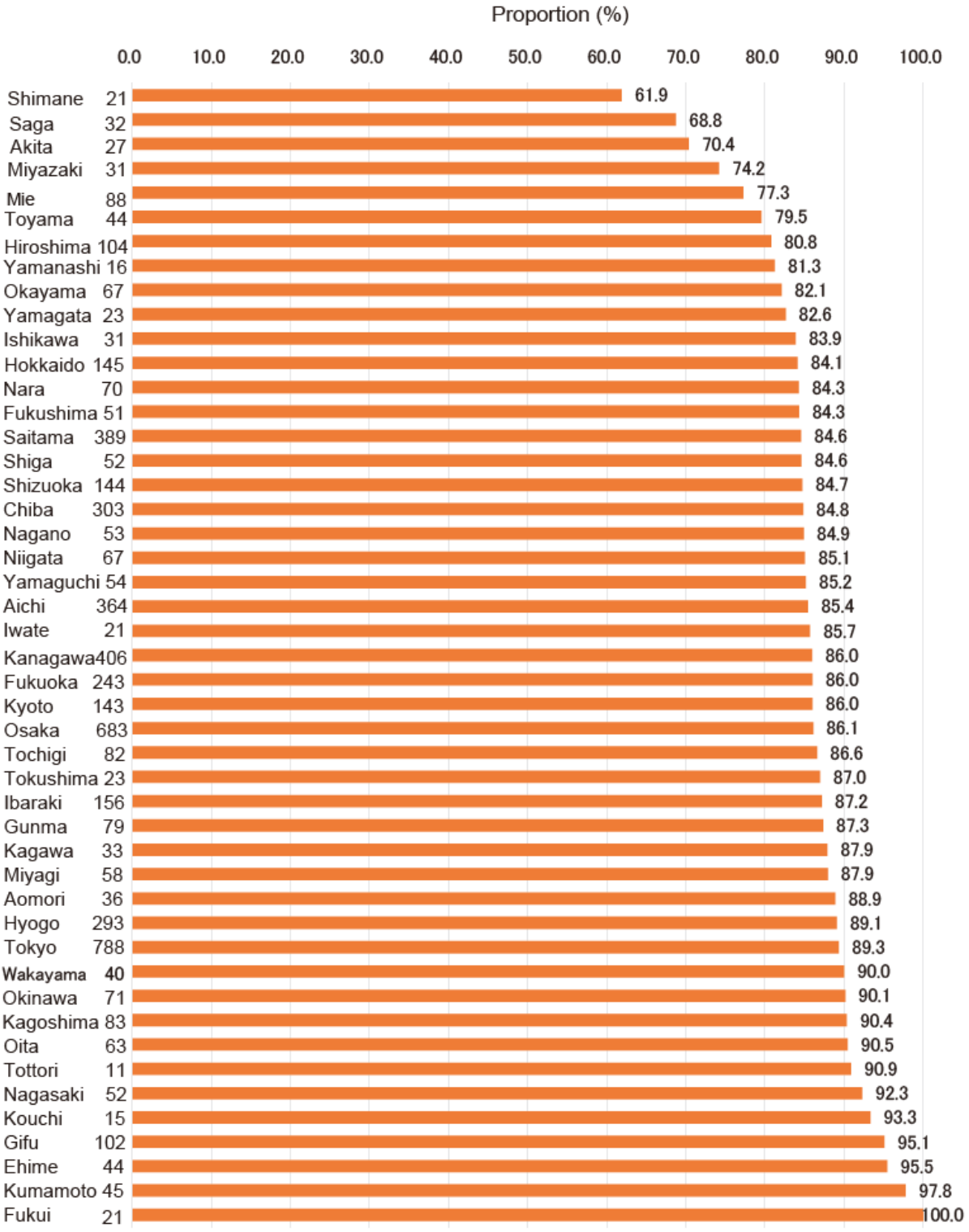
H: isoniazid (INH), R: rifampicin (RFP), E: ethambutol (EB), S: streptomycin (SM), Z: pyrazinamide (PZA)

Figure 9-2 Trends in the proportion of newly notified tuberculosis patients aged 80 years old and above by treatment regimen upon notification, 2012-2023



(The number of patients described under the year is the number of newly notified tuberculosis patients aged 80 years old and above.)

Figure 9-3 Proportion of newly notified tuberculosis patients aged 79 years and younger receiving regimens of more than 3 drugs including PZA by prefectures, 2023



The number next to the name of the prefecture is the number of newly notified cases aged 79 years or younger.

Figure 9-4 Duration of hospitalization among newly notified TB patients in 2022 who initiated inpatient treatment and were known with the duration by patient category, end of 2023

Figure 9-5 Trends in the median of hospitalization days for newly notified pulmonary tuberculosis patients who initiated inpatient treatment, 2007-2022

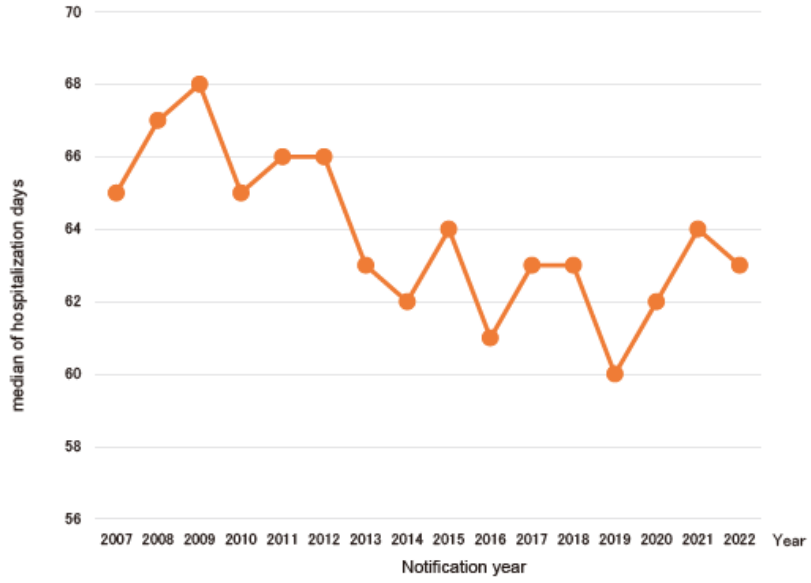
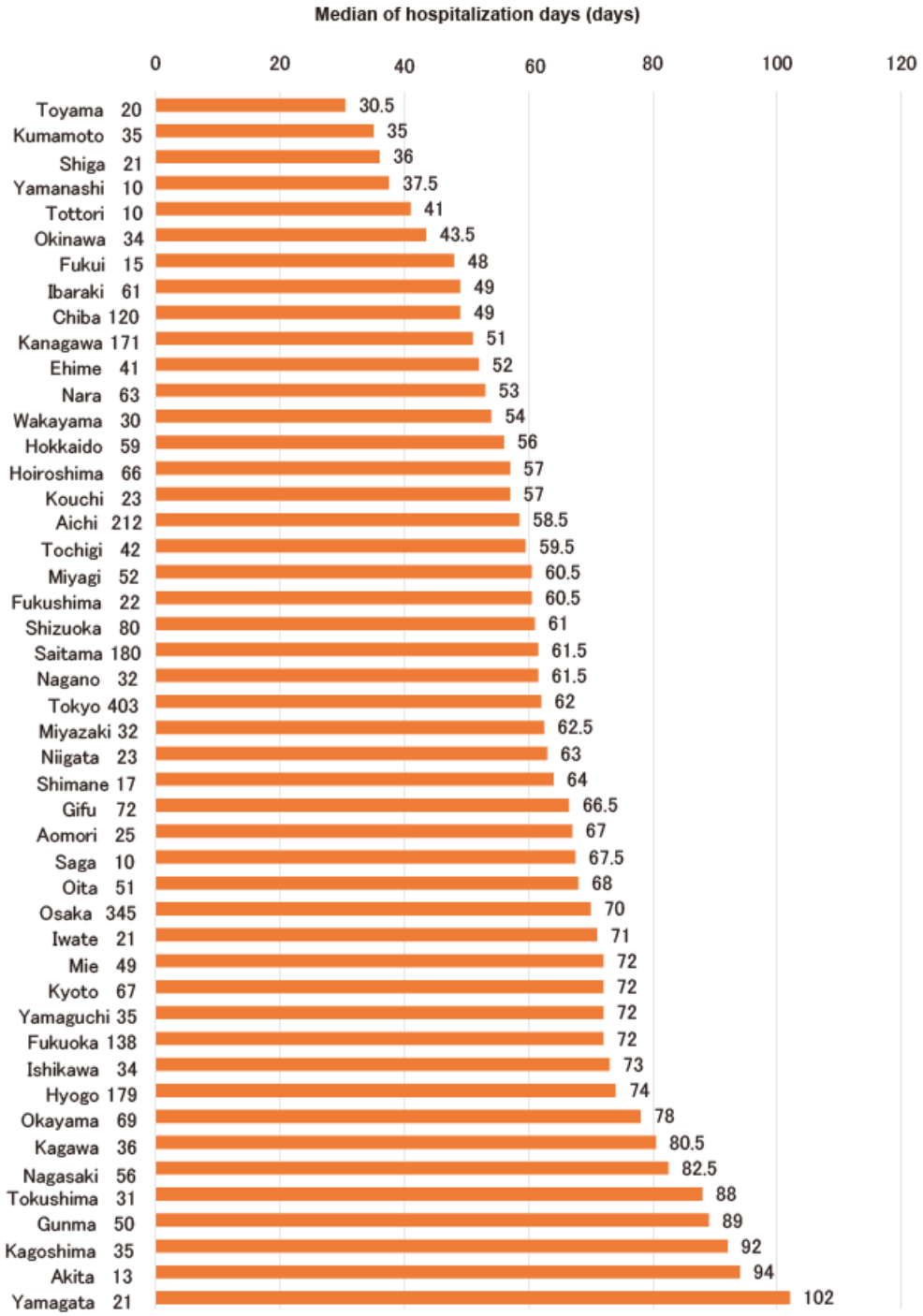
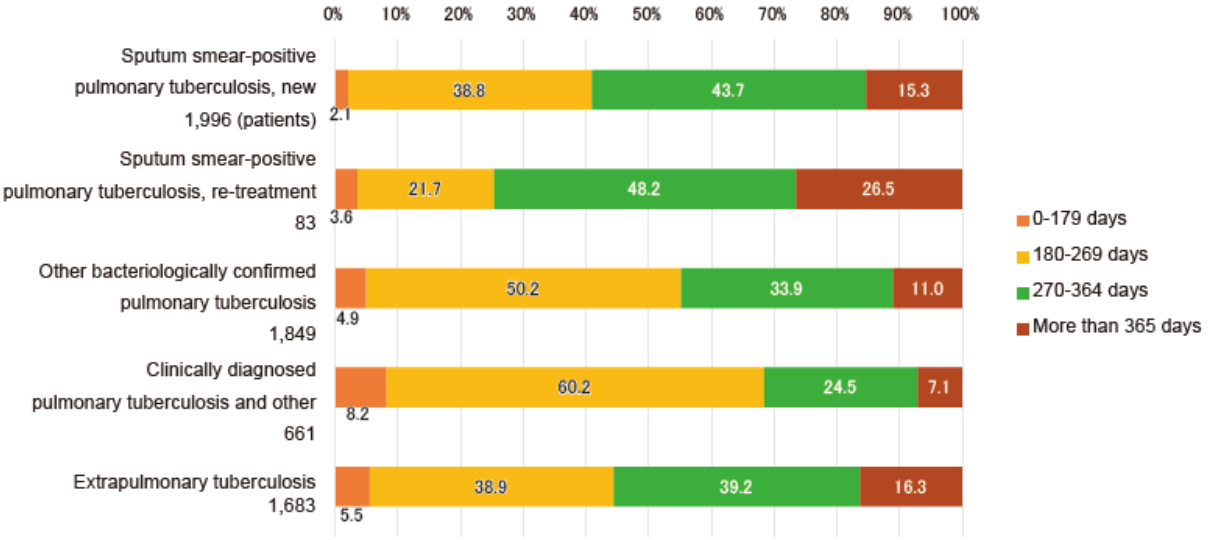


Figure 9-6 Median of hospitalization days for newly notified pulmonary tuberculosis patients who started inpatient treatment in 2022, by prefectures, end of 2023



The number next to the name of the prefecture is the number of patients with pulmonary tuberculosis who were discharged from hospital and whose hospital days were known among those who started inpatient treatment.

Figure 9-7 Distribution of treatment duration among newly notified tuberculosis patients successfully treated in 2022 by patient category, end of 2023



10 Treatment Outcomes for Tuberculosis Patients

Overall Trend

Figure 10-1 shows treatment outcomes by sex at the end of 2023 for the 10,216 newly notified tuberculosis patients in 2022. In total, 18.9% (1,935 patients) were cured, 45.9% (4,694 patients) treatment completed, 27.0% (2,763 patients) died, 0.1% (8 patients) failed, 1.9% (193 patients) lost to follow-up, 1.6% (166 patients) transferred out, 4.3% (441 patients) were still on treatment, and 0.2% (16 patients) were unknown. The rate of treatment success was 64.9% (6,629 patients), including cured and treatment completed.

The treatment success rate by gender tended to be higher for women than for men: 67.7% (2,822 of 4,170 patients) for women and 63.0% (3,807 of 6,046 patients) for men.

Trends by Country of Birth

Figure 10-2 shows treatment outcomes by country of birth (Japanese-born, foreign-born, and unknown country of birth) for newly notified tuberculosis patients in 2022 as of the end of 2023. The success rate of tuberculosis treatment was 62.9% (5,490 out of 8,730 patients) for patients born in Japan and 80.2% (994 out of 1,240 patients) for those born outside Japan, with a higher success rate for those born outside Japan.

The reason for the lower treatment success rate among Japanese-born tuberculosis patients is that the proportion of deaths was high at 30.3%, particularly among the elderly (see Figure 10-3). On the other hand, 9.3% (115 patients) of the foreign-born transferred out during treatment, which was higher than the 0.6% (49 patients) of the Japanese-born who transferred out.

Trends by Age Group

Figure 10-3 shows the treatment outcomes by age group as of the end of 2023 for newly notified tuberculosis patients in 2022.

Among those aged 69 years and younger, more than 75% were successfully treated, whereas the death rate increased sharply among those aged 70 years and older. The death rate among the elderly was 39.9% (1,259 of 3,152 patients) in the 80–89 age group and 58.4% (833 of 1,426 patients) in the 90 and older age group.

Trends by Patient Classification at the Time of Registration

Figure 10-4 shows treatment outcomes by patient classification at the end of 2023 for newly notified tuberculosis patients in 2022.

The treatment success rate among the 3,590 patients with sputum smear-positive PTB treated initially was 58.5% (2,099 patients), and among the 145 patients with sputum smear-positive PTB re-treated, the treatment success rate was 60.0% (87 patients).

The treatment success rate in the 2,839 other bacteriologically-positive PTB patients was 68.9% (1,957

patients), showing a trend toward higher treatment success rates than in the sputum smear-positive PTB patients initially treated.
The treatment success rate among the 882 bacteriologically-negative PTB patients was 80.2% (707 patients), higher than that of other PTB patients. This is due to a low mortality rate of 10.2% (90 patients) during treatment, which is partly attributed to the younger age structure of the patients (the mean age of patients with sputum smear-positive PTB initially treated was 73.1 years old, and that of patients with bacteriologically-negative PTB was 55.9 years old).

Treatment Outcomes for Patients with Multidrug-Resistant Tuberculosis
Figures 10-5 and 10-6 show the treatment outcomes at the end of 2023 for 50 newly notified tuberculosis patients with multidrug-resistant tuberculosis who were resistant at least to both INH and RFP in 2021 (Note: multidrug-resistant tuberculosis patients are determined at the end of the second year of the notification year due to the long treatment period).
The overall treatment success rate was 62.0% (31 patients), the death rate was 16.0% (8 patients), and the lost-to-follow-up rate was 4.0% (2 patients).
When the age was divided into less than 60 years old (36 patients) and 60 years old and more (14 patients), the treatment success rate for those younger than 60 years old was 63.9% (23 patients), and there were 3 deaths. The treatment success rate was 60.0% (8 patients) and the death rate was 35.7% (5 patients) in patients aged 60 years old and more, with a high percentage of deaths. Among patients younger than 60 years old, 8.3% (3 patients) transferred out during treatment, and all were foreign-born.

The treatment success rate by country of birth showed no significant difference: 64.0% (16 of 25 patients) for Japanese-born tuberculosis patients and 60.0% (15 of 25 patients) for foreign-born tuberculosis patients. Among Japanese-born tuberculosis patients, the death rate was 28.0% (7 patients), whereas among foreign-born tuberculosis patients, 12.0% (3 patients) transferred out.

Figure 10-1 Treatment outcomes for newly notified tuberculosis patients in 2022 by sex (at the end of 2023)

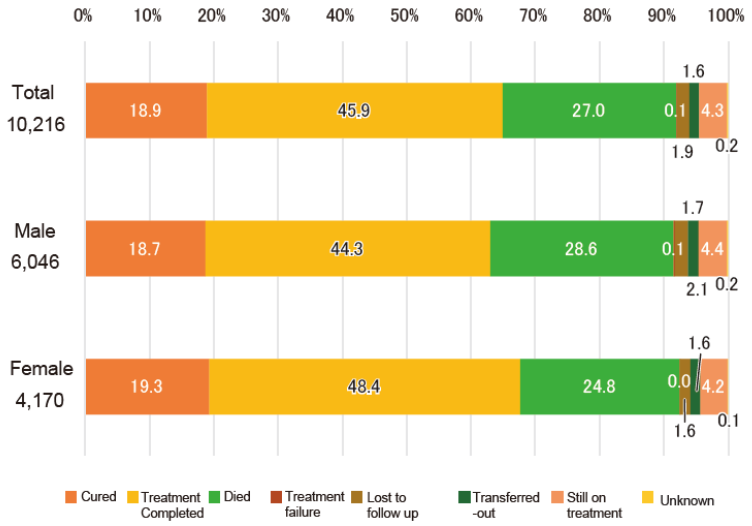


Figure 10-2 Treatment outcomes for newly notified tuberculosis patients in 2022 by country of birth (at the end of 2023)

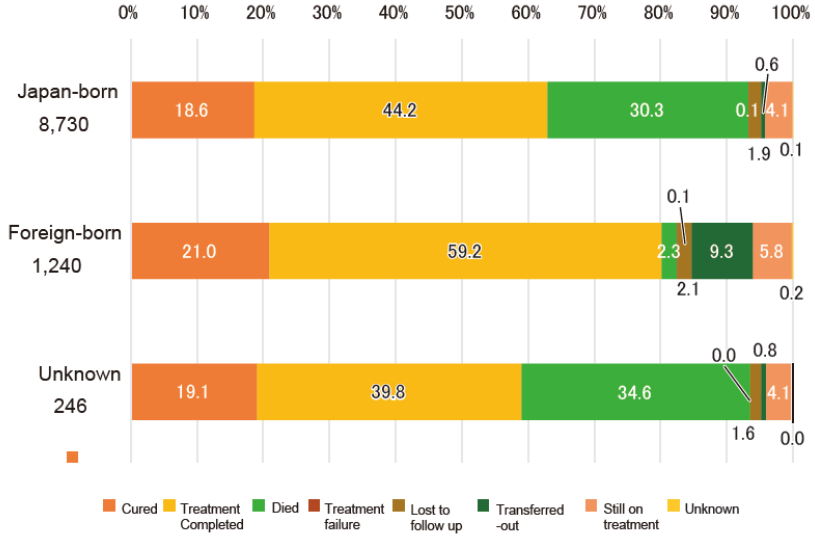


Figure 10-3 Treatment outcomes for newly notified tuberculosis patients in 2022 by age groups (at the end of 2023)

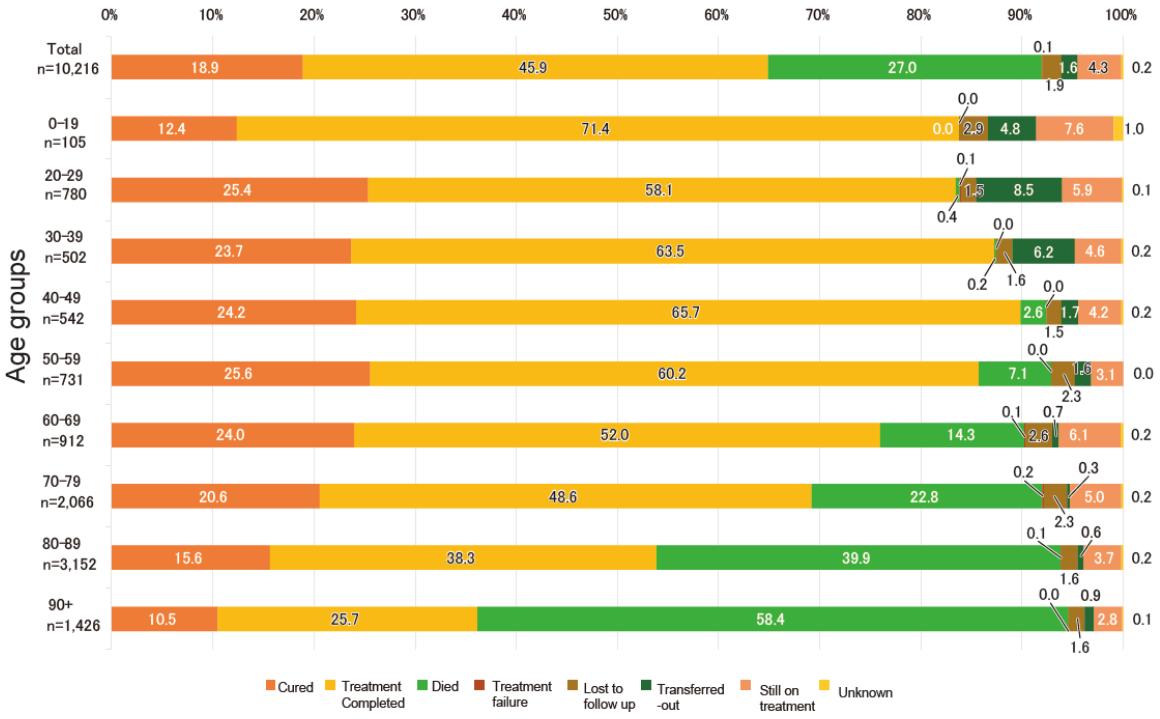
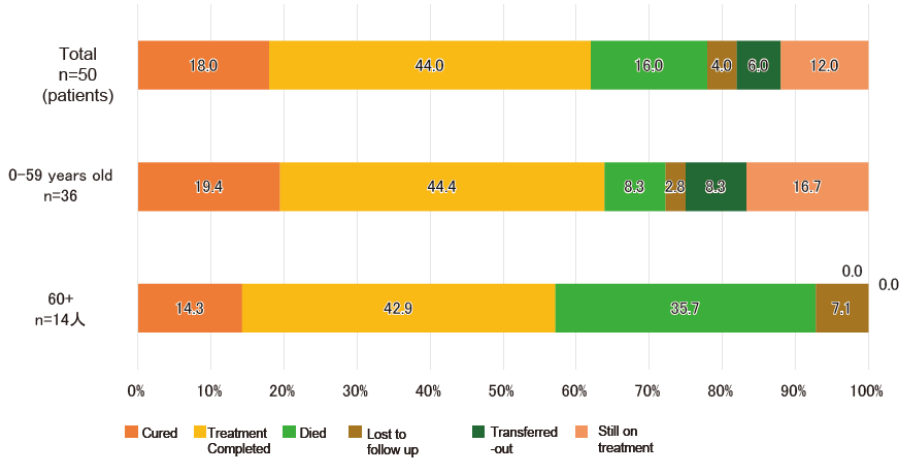


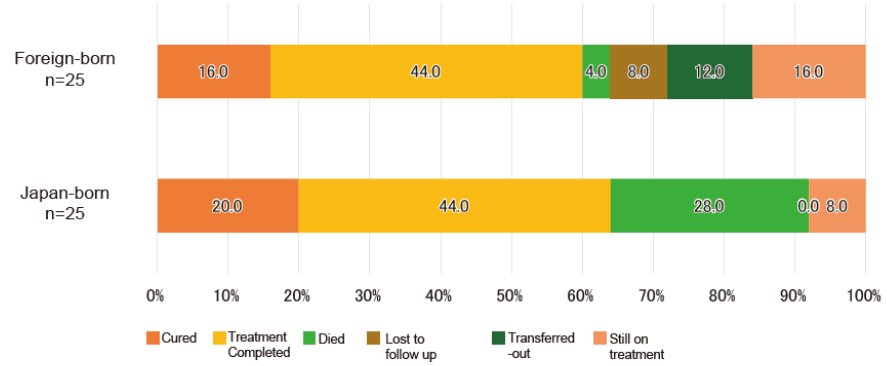
Figure 10-4 Treatment outcomes for newly notified tuberculosis patients in 2022 by patients category (at the end of 2023)

Figure 10-5　Treatment outcomes for newly notified multi drug-resistant* tuberculosis patients in 2021 by age groups (at the end of 2023)



※confirmed culture-positive and known resistance to both INH and RFP.

Figure 10-6　Treatment outcomes for newly notified multi drug-resistant* tuberculosis patients in 2021 by country of birth (at the end of 2023)



※confirmed culture-positive and known resistance to both INH and RFP.