5 Tuberculosis in Patients of Foreign-Born

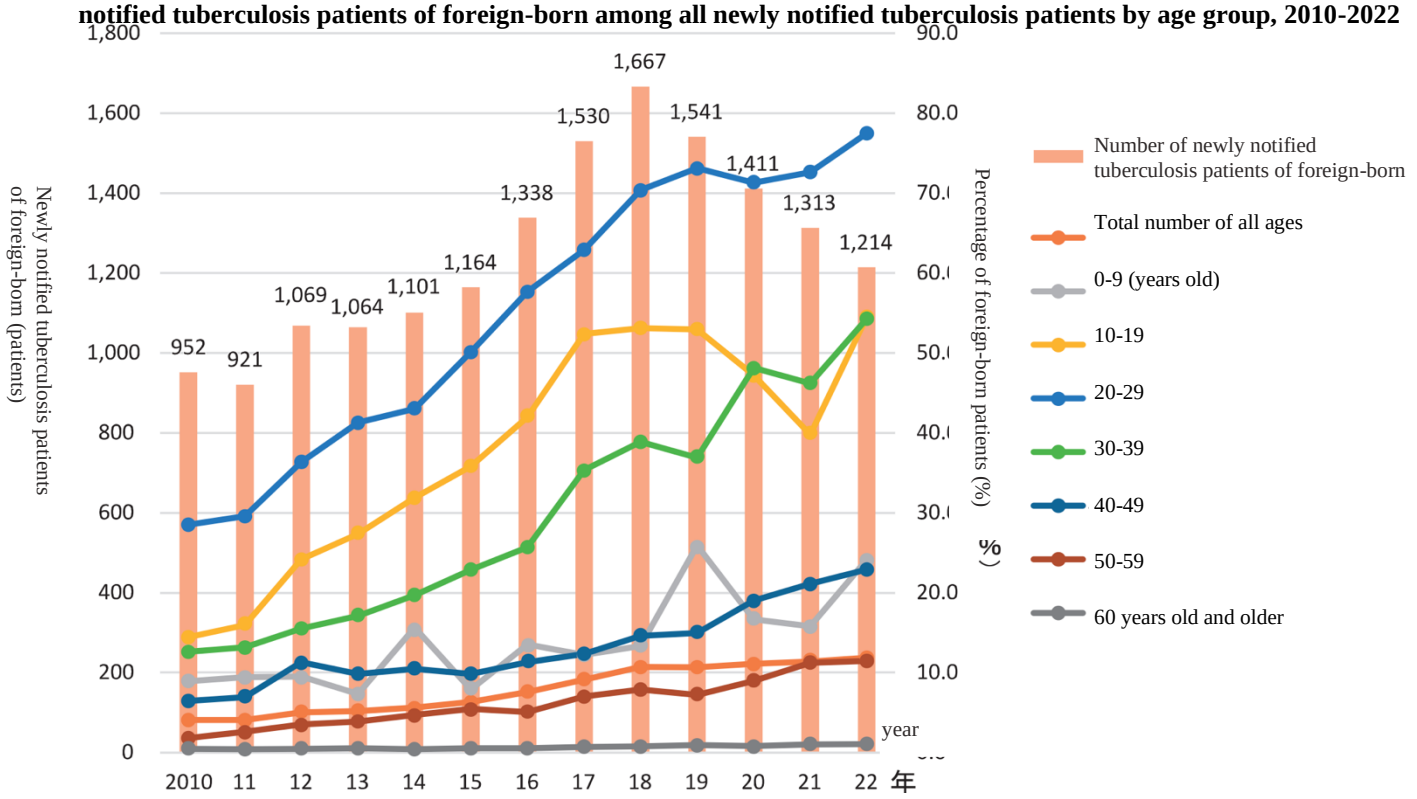
Annual trends of numbers and proportions by age group

Of the 10,235 newly notified tuberculosis cases in 2022, the country of birth was known for 9,887 (96.6%). The number of foreign-born cases was 1,214, a decrease of 99 from 1,313 in the previous year. However, the proportion of foreign-born cases among the total 10,235 newly notified tuberculosis cases, including those of unknown country of birth, increased to 11.9% from 11.4% in the previous year (**Figure 5-1**).

The proportion of foreign-born patients by age group was the highest in the 20~29 age group at 77.5% (602 of 777), an increase from 72.6% in the previous year. More than half of the patients in the 30~39 age group (54.3%, 273 out of 503) were foreign-born. All other age groups increased from the previous year (**Figure 5-1**).

Based on the statistics on foreigners residing in Japan as of the end of June 2022 (http://www.moj.go.jp/isa/ policies/ statistics/ toukei_ichiran_touroku.html), the incidence rate of foreign-born tuberculosis patients in 2022 was 41.0 per 100,000 population, a decrease from 46.5 in the previous year, but approximately 5.0 times higher than the overall incidence rate of 8.2.

Figure 5-1 Annual trends in the number of newly notified tuberculosis patients of foreign-born and the proportion of newly notified tuberculosis patients of foreign-born among all newly notified tuberculosis patients by age group, 2010-2022



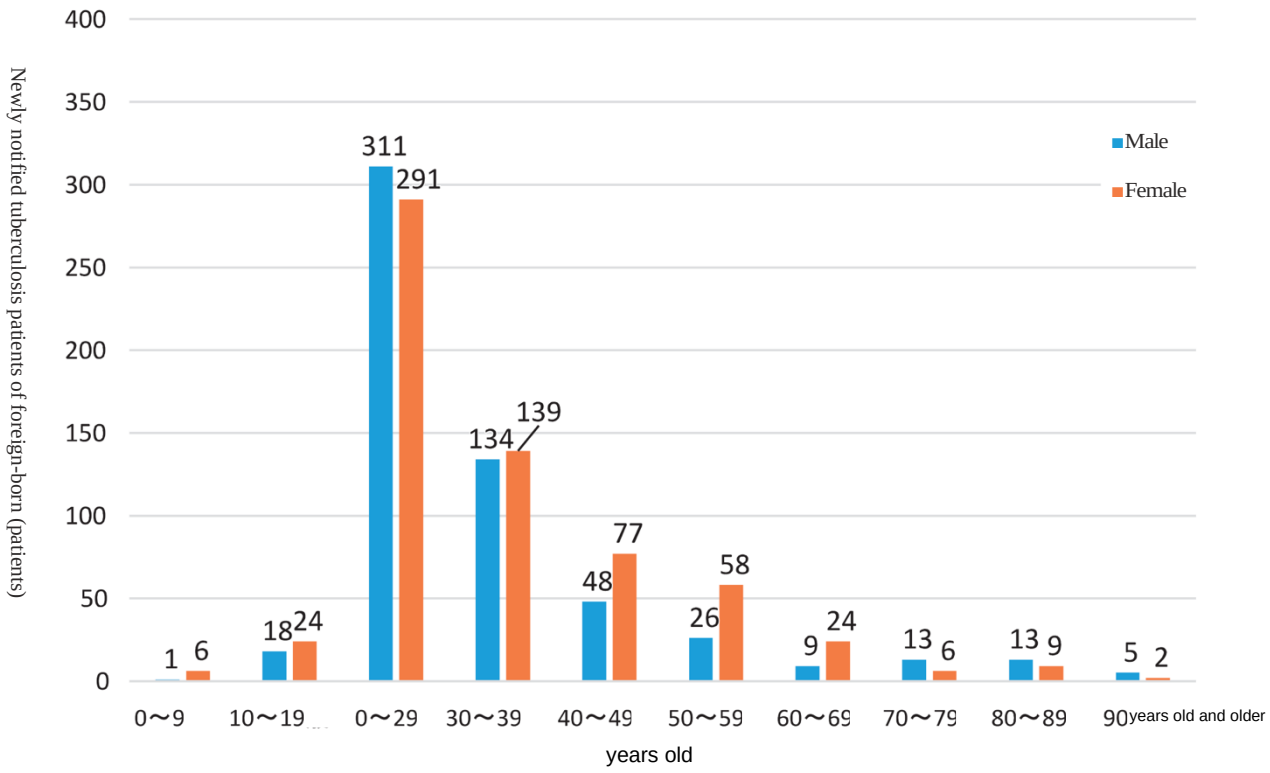
Patient Classification

Of the 1,214 newly notified tuberculosis patients of foreign-born in 2022, 894 (73.6%) were pulmonary tuberculosis patients, and 320 (26.4%) were extrapulmonary tuberculosis patients. Among pulmonary tuberculosis patients, 671 pulmonary tuberculosis patients were bacteriologically confirmed to have *Mycobacterium tuberculosis*, accounting for 75.1% of all pulmonary tuberculosis patients. The number of sputum smear-positive pulmonary tuberculosis patients was 308, accounting for 34.5% of all pulmonary tuberculosis patients. The bacteriologically-positive rate of 75.1% among all pulmonary tuberculosis patients of foreign-born was 14.4 points lower than that of 89.5% (5,662 of 6,324) among Japanese-born pulmonary tuberculosis patients.

Distribution by sex and age group

Of the 1,214 newly notified tuberculosis patients born abroad in 2022, 578 (47.6%) were males, and 636 (52.4%) were females, showing that the number of female patients with newly notified tuberculosis was slightly higher. Among newly notified tuberculosis patients aged 20~29, the age group with the highest number of newly notified cases, the number of male patients was higher, but among the age group aged 30~69, the number of female patients was higher than that of male patients. Among newly notified tuberculosis cases born in foreign countries, the number of young people with tuberculosis, aged 10~39, accounted for 75.5% (917 cases) of all tuberculosis cases born in foreign countries (**Figure 5-2**).

Figure 5-2 Distribution of newly notified tuberculosis patients of foreign-born by sex and age group, 2022



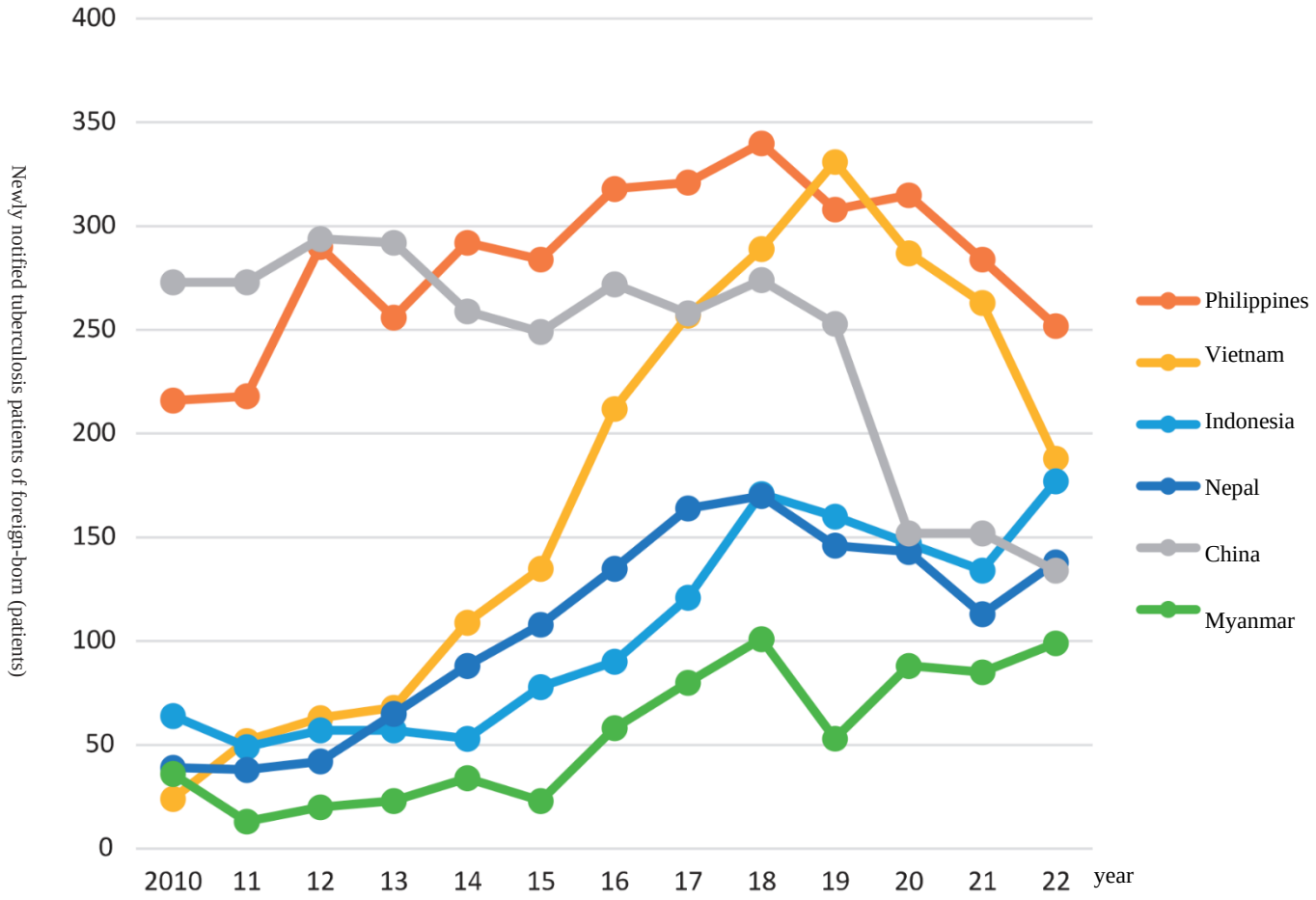
Country of birth and occupation

Among the countries of birth, the Philippines had the highest number of patients (252, 20.8% of newly notified tuberculosis cases from foreign births). The next highest number of patients was in Vietnam (188, 15.5%), Indonesia (177, 14.6%), Nepal (138, 11.4%), China (134, 11.0%), and Myanmar (99, 8.2%). The number of newly notified tuberculosis patients in the top six countries with the largest number of foreign-born tuberculosis patients in Japan (the Philippines, Vietnam, Indonesia, Nepal, China, and Myanmar) was 988, accounting for 81.4% of all foreign-born tuberculosis patients (**Figure 5-3**).

The annual trend in the number of newly notified tuberculosis patients born abroad has been that the Philippines and China used to account for about half of the total number of tuberculosis patients, but the number of tuberculosis patients born in Vietnam has increased rapidly since 2014, and the number of patients born in Indonesia, Nepal, and Myanmar has also increased. In 2019, the number of tuberculosis cases born in Vietnam overtook that of the Philippines for the first time. Still, the Philippines again became the largest number of tuberculosis patients from 2020 onward (**Figure 5-3**).

Among 1,214 newly notified tuberculosis patients born abroad in 2022, the most common occupation was "other full-time workers"* (430, 35.4% of all newly notified tuberculosis patients born abroad), followed by "student above high school age" (202, 16.6%) and "unemployed" (165, 13.6%).

Figure 5-3 Annual trends in the number of newly notified tuberculosis patients foreign-born in six major countries, 2010-2022



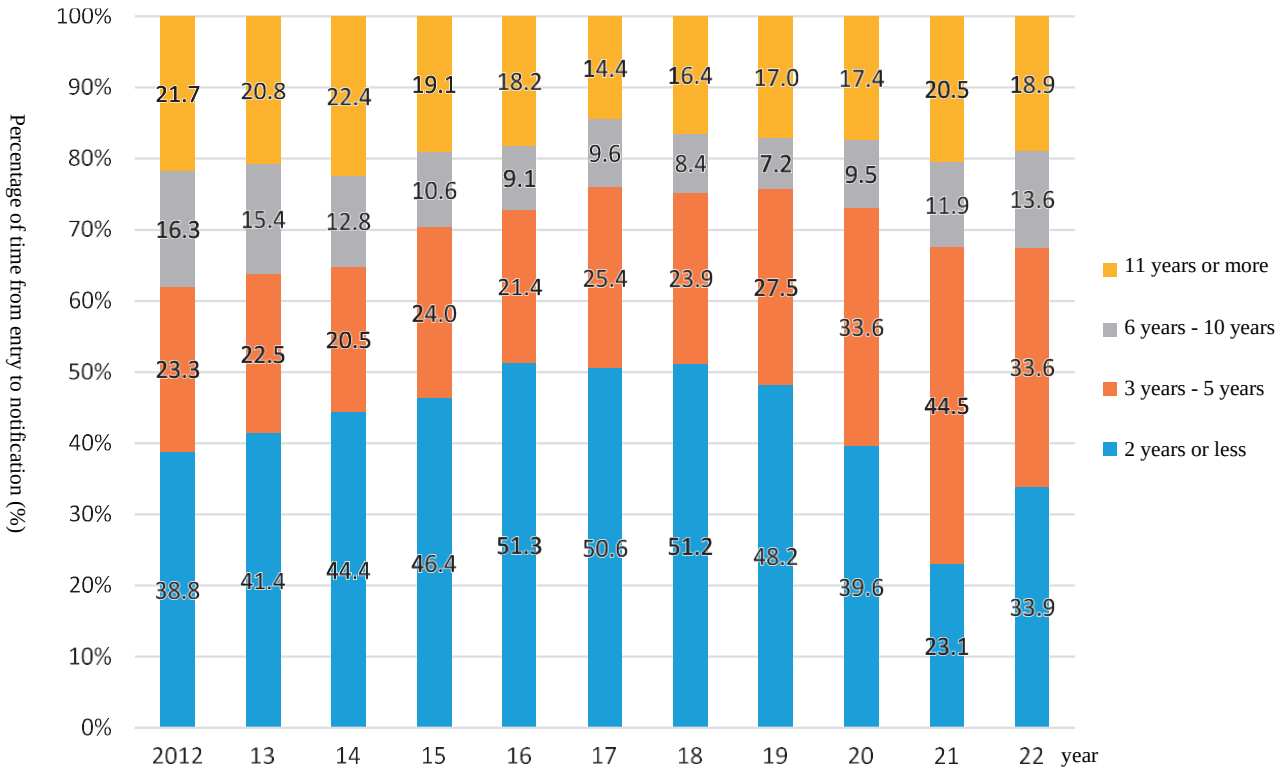
The occupational composition ratio varies widely by country of birth. For example, in the Philippines (252 patients), 33.3% (84 patients) are "other full-time workers," while only 5.2% (13 patients) are "high school students and older." In contrast, among the Nepalese natives (138), 43.5% (60) were "high school students and older," and 23.9% (33) were "other full-time workers."*

* "other full-time workers" include full-time workers in the service industry, nurses, public health nurses, medical doctors, other medical professionals, care workers, school teachers, and childcare workers.

Time of entry into Japan

The entry date of foreign-born tuberculosis patients has been known only for the year of entry since 2012 in the Tuberculosis Surveillance System in Japan. Of the 14,412 newly notified tuberculosis patients of foreign birth from 2012 to 2022, the year of entry was known for 9,314 (64.6%). Of the 1,214 newly notified tuberculosis patients of foreign birth in 2022, 760 (62.6%) had a known date of entry, of which 33.9% (258) were within 2 years from entry to tuberculosis diagnosis. This percentage decreased significantly to 23.1% (194 out of 840) in 2021 but returned to near the 2020 level this year **(Figure 5-4)**.

Figure 5-4 Annual change in the percentage of time from entry to tuberculosis diagnosis for newly notified tuberculosis patients of foreign birth, 2012 - 2022



6 Social Attributes of Newly Notified Tuberculosis Patients

Occupation

The occupational categories of the 10,235 newly notified tuberculosis patients in 2022 are shown in **Table 6-1**. The most significant number of 6,706 (65.5%) were unemployed for all ages since most of the elderly were classified as unemployed. This was followed by 1,355 (13.2%) of other permanent workers.

Among the 3,046 newly notified tuberculosis patients aged 64 years and younger, 1,148 (37.7%) were other regular workers, the most significant number. The number of medical-related occupations, including nurses, public health nurses, physicians, and other medical personnel and caregivers, was 285, accounting for 9.4%. In particular, 169 (5.5%) of the other medical professionals and caregivers were the largest number. The number of unemployed patients was 463, accounting for 15.2% of those aged 64 and younger. Elementary and junior high school students and above accounted for 266 patients (8.7%), of whom 204 (76.7%) were foreign-born patients.

Table 6-1 Number of newly notified tuberculosis patients, by occupation, 2022

All ages

Occupation	Newly notified tuberculosis patients	Percentage (%)
Customer Service	195	1.9
Nurse Public health nurse	113	1.1
Physician	20	0.2
Other health care workers Nursing care workers	192	1.9
Teacher Childcare Worker	48	0.5
Other Permanent Worker	1,355	13.2
Other temporary employment Day employment	307	3.0
Other self-employed Freelance	387	3.8
Household workers	67	0.7
Nursery school Kindergarten children	9	0.1
Other infants and toddlers	15	0.1
Elementary and junior high school students	10	0.1
High school and above students	257	2.5
Unemployed	6,706	65.5
Other	261	2.6
Unknown	293	2.9
Total number	10,235	100.0%

64 years old and younger

Occupation	Newly notified tuberculosis patients	Percentage (%)
Customer Service	152	5.0
Nurse Public health nurse	106	3.5
Physician	10	0.3
Other health care workers Nursing care workers	169	5.5
Teacher Childcare Worker	43	1.4
Other Permanent Worker	1,148	37.7
Other temporary employment Day employment	195	6.4
Other self-employed Freelance	159	5.2
Household workers	40	1.3
Nursery school Kindergarten children	9	0.3
Other infants and toddlers	15	0.5
Elementary and junior high school students	10	0.3
High school and above students	256	8.4
Unemployed	463	15.2
Other	162	5.3
Unknown	109	3.6
Total number	3,046	100.0%

Type of insurance at the time of notification

Table 6-2 shows the types of insurance at the time of notification for the 10,235 newly notified tuberculosis patients. Since many newly notified tuberculosis patients were elderly, 67.8% (6,942 patients) were covered by the Late-Stage Senior Citizen's Health Care System and National Health Insurance. Patients receiving and applying for public assistance together accounted for 6.9% (708 patients), which was a higher percentage than the 1.62% of the actual number of people protected by public assistance in the nation in 2022 (Survey on the number of people protected by public aid, Ministry of Health, Labor and Welfare, the approximate number for December 2022).

Table 6-2 Number of newly notified tuberculosis patients by type of insurance at enrollment, 2022

Type of insurance at the time of notification	Number of newly notified tuberculosis patients	Percentage (%)
Employee himself/herself	1,828	17.9
Employee's family	354	3.5
National Health Insurance General	1,619	15.8
National Health Insurance Retired Person	22	0.2
National Health Insurance Retirement Family	10	0.1
Late Age Medical Care System	5,291	51.7
Life Protection (in the process of receiving)	682	6.7
Life Protection (Application)	26	0.3
Other	95	0.9
Unknown	308	3.0
Total number	10,235	100.0%

The employee himself/herself ・Family members: Employees insured by union-managed health insurance, various mutual aid associations, National Health Insurance-managed health insurance, Seamen's union insurance, Daily employment health insurance, etc., and their dependents

Socially and economically deprived

Table 6-3 summarizes newly notified tuberculosis patients aged between 25 and 64 with socioeconomic deprivation factors. Here, homelessness, unemployment, welfare recipients, and those applying for public assistance were considered factors contributing to socioeconomic deprivation.

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

Among 2,572 newly notified tuberculosis patients aged 25-64 years, 2,084 (81.0%) had none of the above socioeconomic deprivation factors, 361 (14.0%) had only one, 118 (4.6%) had two, and 9 (0.3%) had all three.

Table 6-3 Newly notified tuberculosis patients aged 25-64 years with socioeconomic deprivation factors by sex, by age group, and by country of birth, 2022

		25~64 years old Newly notified tuberculosis patients		Homeless experienced		Unemployment		Life protection is being given		Life Protection Application in Progress	
		Number of patients	Percentage (%)	Number of patients	Percentage (%)	Number of patients	Percentage (%)	Number of patients	Percentage (%)	Number of patients	Percentage (%)
Total number		2,572		25		443		143		13	
Sex	Male	1,530	59.5	22	88.0	257	58.0	121	84.6	12	92.3
	Female	1,042	40.5	3	12.0	186	42.0	22	15.4	1	7.7
Age group	25~34	685	26.6	2	8.0	61	13.8	6	4.2	1	7.7
	35~44	479	18.6	3	12.0	59	13.3	8	5.6	0	0.0
	45~54	666	25.9	8	32.0	109	24.6	50	35.0	5	38.5
	55~64	742	28.8	12	48.0	214	48.3	79	55.2	7	53.8
Country of birth	Japanese-born	1,702	66.2	22	88.0	335	75.6	132	92.3	12	92.3
	Foreign-born	800	31.1	2	8.0	98	22.1	9	6.3	1	7.7
	Unknown	70	2.7	1	4.0	10	2.3	2	1.4	0	0.0

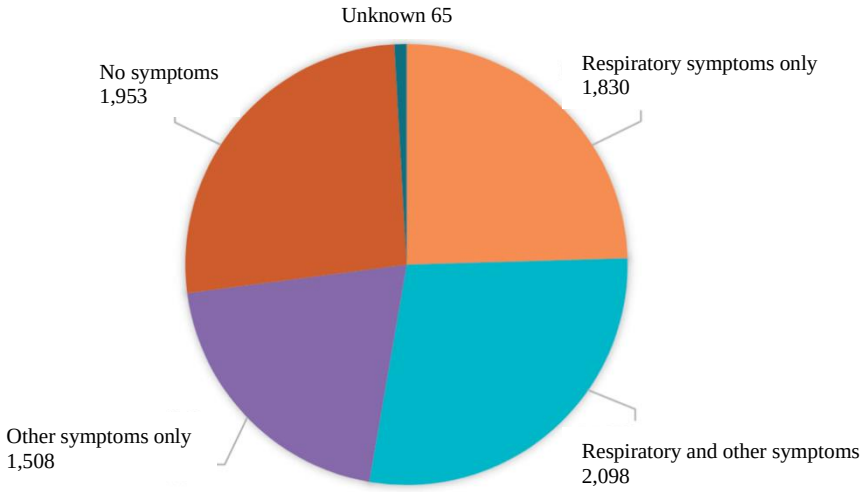
7 Patient Detection

Bacteriological test results at the time of notification and the presence of symptoms

Of the 7,454 newly notified pulmonary tuberculosis patients in 2022, 3,703 (49.7%) were sputum smear-positive. Of these, 3,562 (47.8%) were treated for the first time, and 141 (1.9%) were retreated. In addition, 2.826 (37.9%) were positive for other *Mycobacterium tuberculosis* (smear positive other than sputum, smear-negative culture positive, or nucleic acid amplification positive), and together, 6,529 (87.6%) of the pulmonary tuberculosis cases were confirmed positive by the tuberculosis bacilli test.

Regarding symptoms at diagnosis, 1,830 (24.6%) of 7,454 pulmonary tuberculosis patients had only respiratory symptoms such as cough, and 2,098 (28.1%) had both respiratory and other symptoms. Thus, more than half of the patients, 3,928 (52.7%), had respiratory symptoms. The number of patients detected with some symptoms was 5,436 (72.9%) (**Figure 7-1**).

Figure 7-1 Presence or absence of respiratory symptoms and other symptoms at the time of discovery in 7,454 newly notified pulmonary tuberculosis patients, 2022



Respiratory symptoms: cough, sputum, bloody sputum, karate blood
Other symptoms: wheezing, chest pain, back pain, shortness of breath, fever, night sweats, generalized fatigue, and weight loss.
No symptoms include health checkup findings

Figure 7-2 shows the delay in detecting 5,436 symptomatic patients among the newly notified pulmonary tuberculosis patients in 2022, by Japanese-born and by foreign-born cohort. Delay in diagnosis refers to the period between the first visit to a medical institution and the diagnosis of tuberculosis, and delay in detection refers to the combined period of delay in visit and delay in diagnosis. Percentages are calculated below by excluding those with an unknown duration of each delay from the denominator.

For Japanese-born patients, among 4,753 patients with symptomatic pulmonary tuberculosis*, 53.7% had a delay in consultation of less than 2 weeks, and 14.3% had a delay of between 2 weeks and 1 month. 61.3% of the cases had a delay in diagnosis of less than 2 weeks, indicating that the delay was generally short. Overall, 24.9% of the cases were detected within 2 weeks, 21.1% within 2 weeks to 1 month, and 22.4% within 1 month to 2 months.

The same tendency was observed among the foreign-born patients, but the delay in consultation was slightly longer than that among the Japanese-born patients. Among 506 patients with symptomatic pulmonary tuberculosis*, 41.4% had a delay in consultation of less than 2 weeks, and 20.2% had a delay of 2 weeks to 1 month. On the other hand, the majority (62.0%) were diagnosed within 2 weeks, indicating that the delay in diagnosis was generally short, as were 8 live births patients. Overall, 17.4% of the cases were detected within 2 weeks, 18.7% within 2 weeks to 1 month, and 25.9% within 1 month to 2 months.

（*: In addition to these, there are 177 other people whose country of birth is unknown.）

Figure 7-2　For Symptomatic Newly Notified Tuberculosis Patients, delays in medical examination, diagnosis, and detection by Japanese-born and Foreign-born, 2022

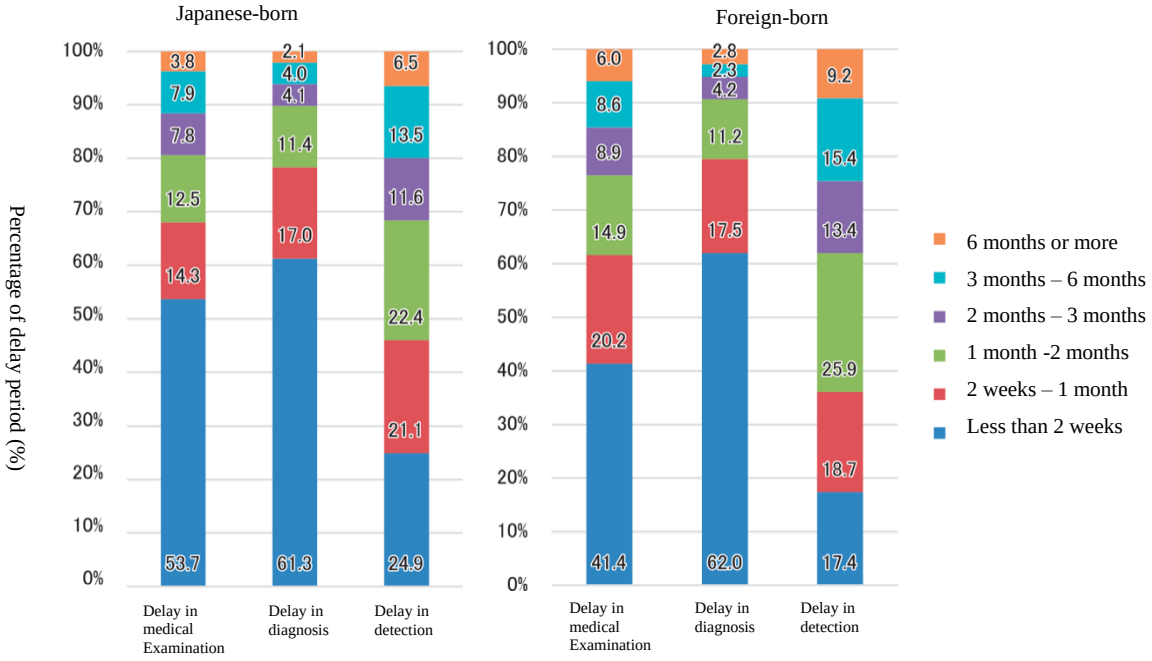


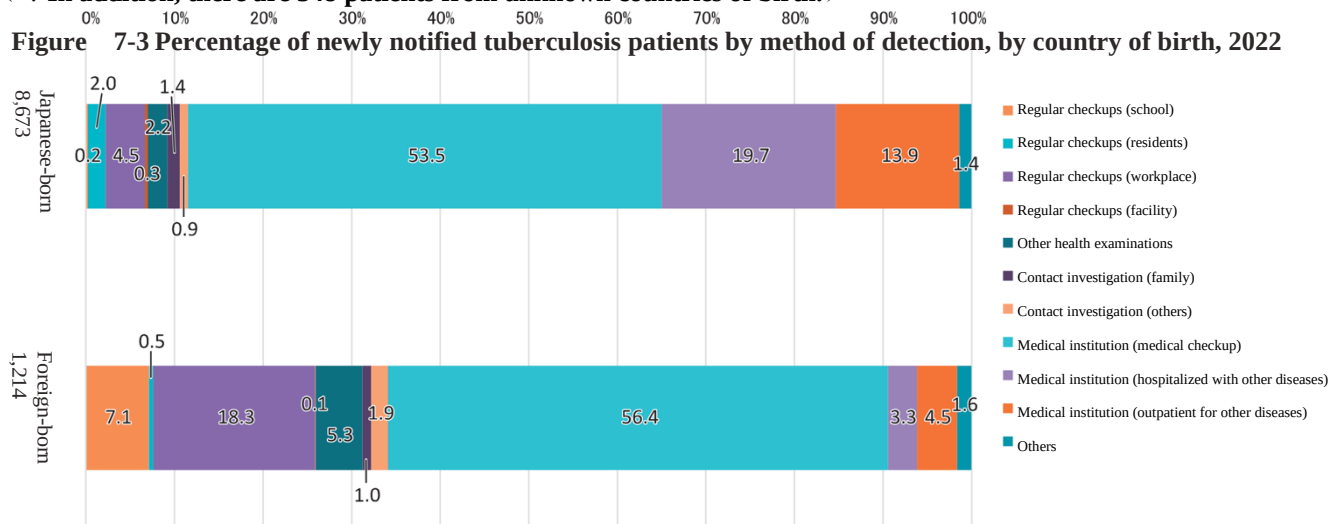
Figure 7-3 shows the detection method of newly notified tuberculosis patients in 2022, separately for 8,673 Japanese-born and 1,214 foreign-born patients*.

Among the Japanese-born patients, only 997 (11.5%) were detected by medical examinations (individual health checkups, regular health checkups, contact investigation, other group checkups, and occupational health screening), while 7,556 (87.1%) were examined by medical institutions, the majority. In particular, more than half of the patients, 4,640 (53.5%), were diagnosed as symptomatic.

Among the foreign-born patients, 414 (34.1%) were detected by medical examinations, far exceeding the percentage of Japanese-born patients. In particular, 315 (25.9%) of the cases were detected by periodic health examinations, which accounted for most health examination findings, suggesting the importance of periodic health examinations in detecting foreign-born patients. On the other hand, 780 patients (64.3%) were diagnosed at medical institutions, and 685 patients (56.4%) were diagnosed with symptoms, which accounted for the majority of the cases detected at medical institutions.

（*: **In addition, there are 348 patients from unknown countries of birth.**）

Figure　7-3 Percentage of newly notified tuberculosis patients by method of detection, by country of birth, 2022



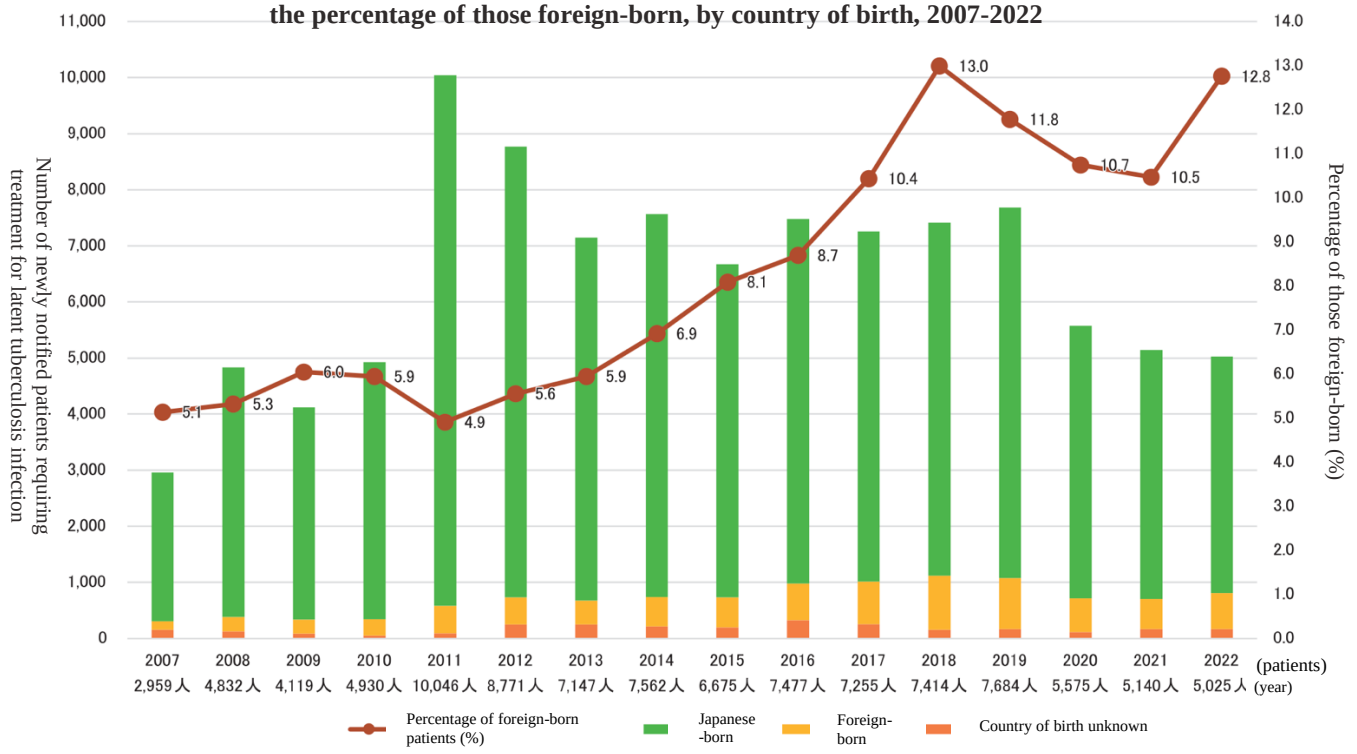
8 Latent Tuberculosis Infection

Trends over time, by country of birth, by age group

The number of newly notified patients requiring treatment for latent tuberculosis infection in 2022 was 5,025. The number of new notifications has remained at about 7,000 per year since 2013 until 2019, but reached 5,575 in 2020 and has remained at about 5,000 since 2021 (**Figure 8-1**). In 2022, there were 641 foreign-born, a 19.1% increase from the previous year's 538. On the other hand, the number of Japanese-born was 4,217, a decrease of 4.9% from 4,434 in the previous year.

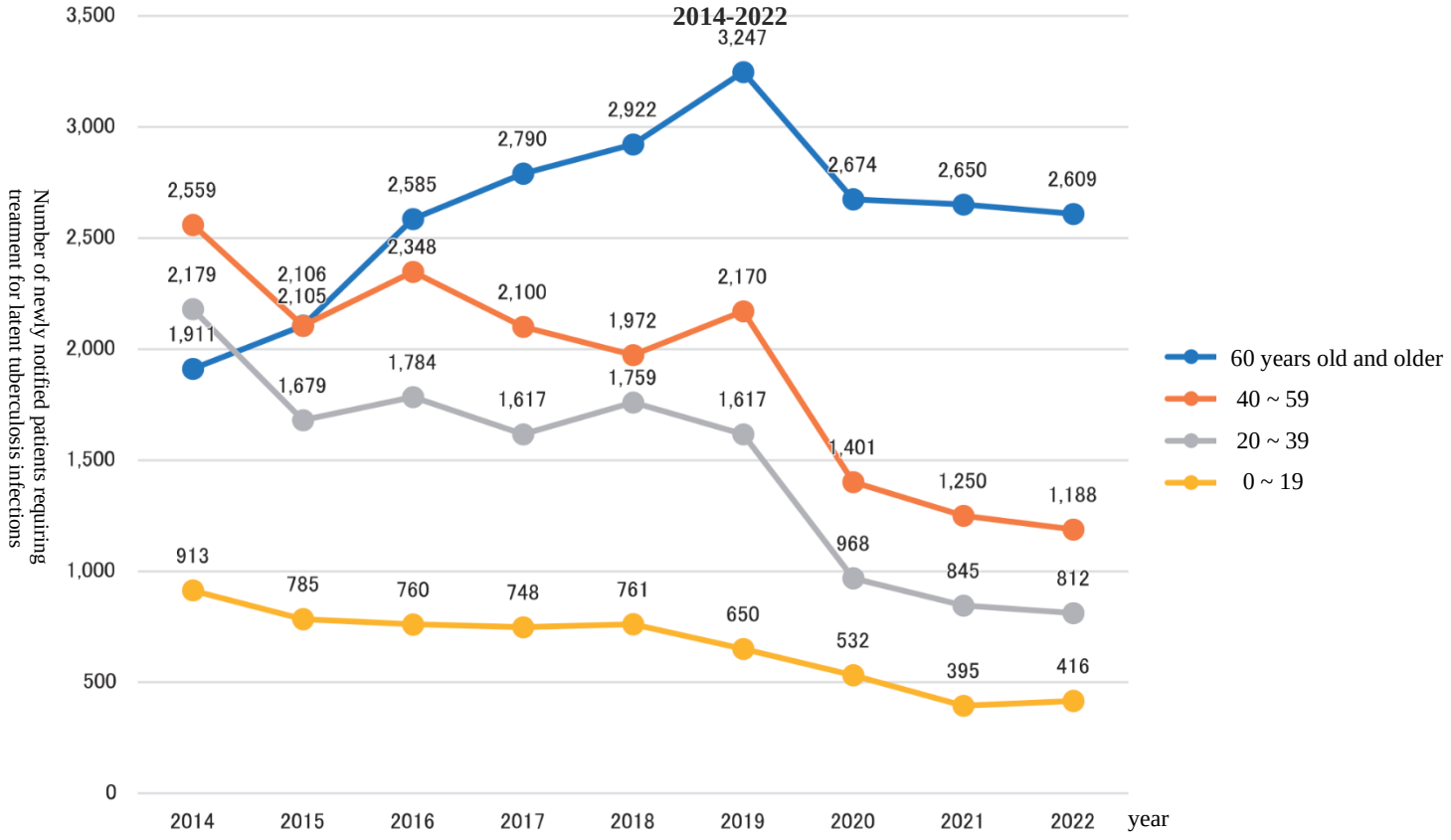
The proportion of foreign-born patients (including unknown country of birth in the denominator) among the number of patients requiring treatment for latent tuberculosis infection had been increasing since 2012 until a peak of 13.0% in 2018, but showed a decreasing trend after 2019. However, it increased again to 12.8% in 2022 (**Figure 8-1**).

Figure 8-1 Annual trends in the number of newly notified patients requiring treatment for latent tuberculosis infection and the percentage of those foreign-born, by country of birth, 2007-2022



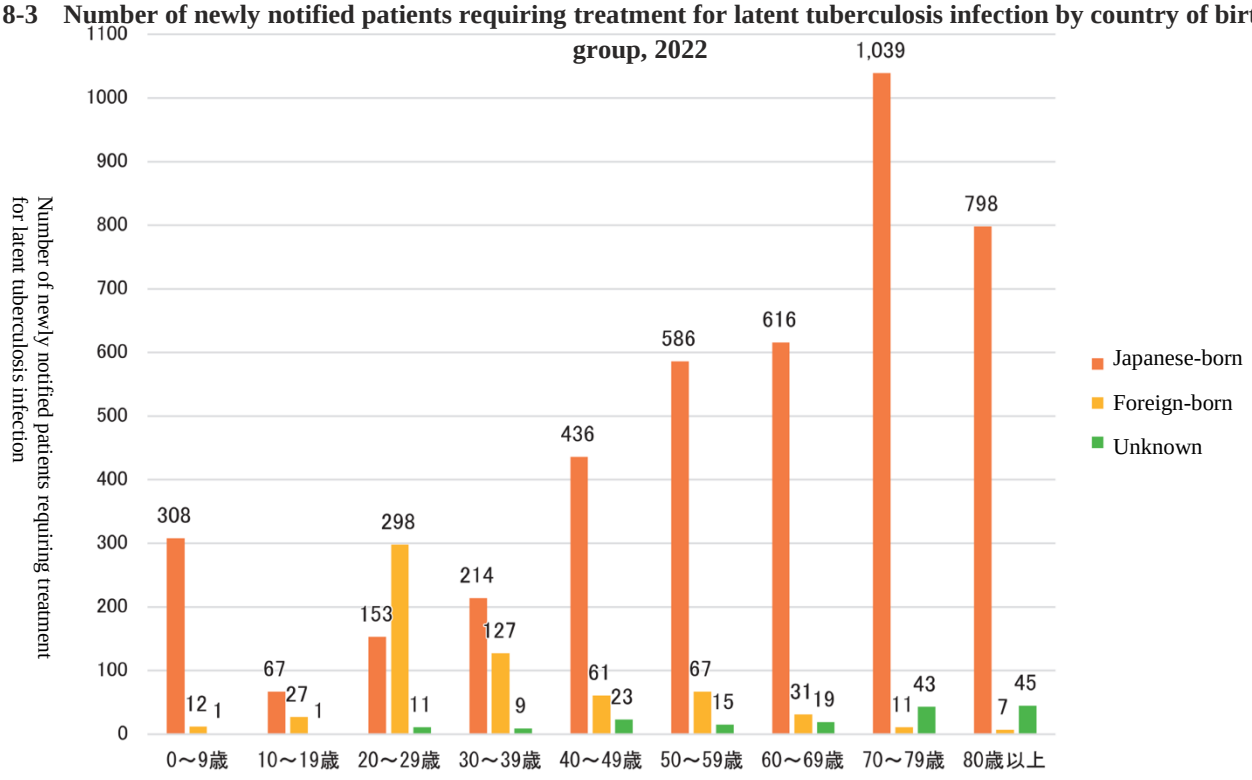
The number of newly notified patients requiring treatment for latent tuberculosis infection from 2014 to 2022 by age group is shown in **Figure 8-2**. Although the number of newly notified patients aged 60 and older increased year by year until reaching 3,247 in 2019, 2,674 patients were notified in 2020, a decrease of 573 patients compared to 2019. 2,609 patients were notified in 2022, a decrease of 41 patients compared to 2021 (**Figure 8-2**). On the other hand, although the number of people in the other age groups has been declining in recent years, the number of 0~19-year-olds increased by 21 from 2021 to 416 in 2022. The number of people in the 20~39 and 40~59 age groups continued to decline, decreasing by 33 patients to 812 and 62 patients to 1,188, respectively.

Figure 8-2 Trends in the number of newly notified patients requiring treatment for latent tuberculosis infection by age group, 2014-2022



The number of newly notified patients requiring treatment for latent tuberculosis infection by age group in 2022 peaked in the age groups of less than 10 years old and 70~79 years old for those born in Japan. On the other hand, notified those among the foreign-born peaked in the 20~29 age group, where the number of newly notified cases among the foreign-born exceeded that among the Japanese-born (**Figure 8-3**).

Figure 8-3 Number of newly notified patients requiring treatment for latent tuberculosis infection by country of birth, by age group, 2022

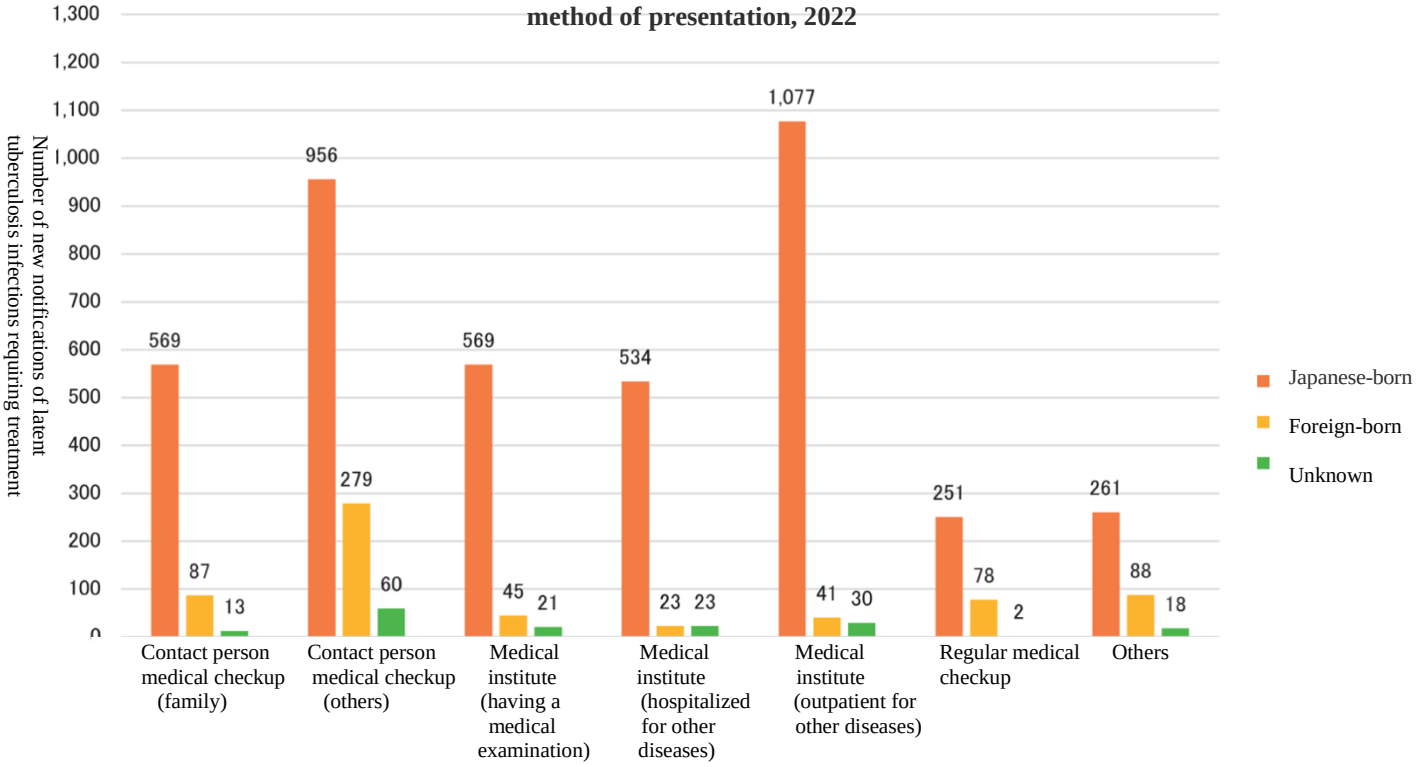


～ (years old)

Detection Methods

The method of detection by country of birth for the 5,025 newly notified patients requiring treatment for latent tuberculosis infection in 2022 (4,217 born in Japan, 641 in foreign countries, and 167 in unknown country of birth) is shown in **Figure 8-4**. Among those born in Japan, the most significant number (1,077) was found at medical institutions while attending hospitals for other diseases, accounting for 25.5% of newly notified patients requiring treatment for latent tuberculosis infection. Among those born in Japan, 569 (13.5%) were detected by family contacts, 956 (22.7%) by extra-familial contacts, and 1,525 (36.2%) were detected by the combined use of both. Among those born outside Japan, 279 (43.5%) were detected by medical checkups with contacts outside the family, and 366 (57.1%), or more than half, were detected by the combined use of medical checkups for family contacts and for contacts outside the family.

Figure 8-4 Number of newly notified patients requiring treatment for latent tuberculosis infection by country of birth, by method of presentation, 2022



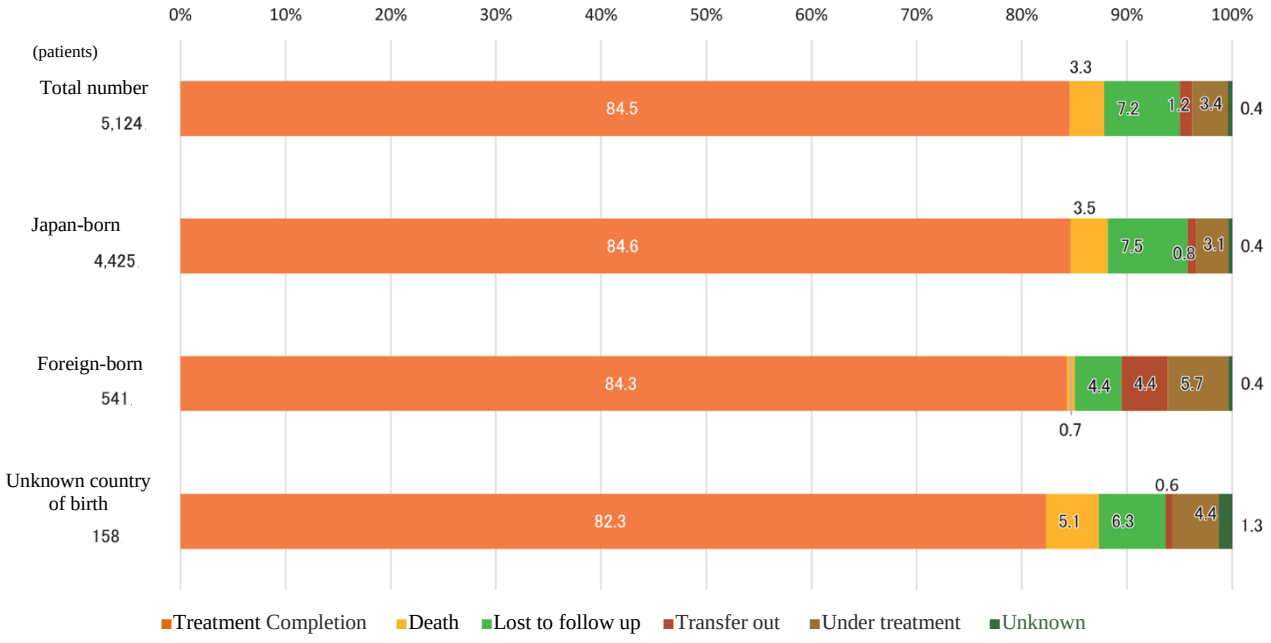
Treatment outcome

Figure 8-5 shows the treatment outcomes at the end of 2022 for the 5,124 patients with latent tuberculosis infection requiring treatment notified in 2021 (4,425 patients born in Japan, 541 patients born abroad, and 158 patients whose country of birth was unknown). The treatment completion rate was 84.6% (3,745) for those born in Japan and 84.3% (456) for those born outside Japan. The treatment completion rate for foreign-born patients improved from 81.5% at the end of 2021 for those enrolled in 2020. The lost-to-follow-up rate (including treatment failure) was 7.5% (33 patients) for those born in Japan and 4.4% (24 patients) for those born outside Japan. It was lower for those born outside Japan. On the other hand, the rate of transfer out was higher among the foreign-born (4.4% (24 patients)) compared with 0.8% (36 patients) among the Japanese-born.

years old and older

(years old)

Figure 8-5 Treatment outcomes of patients requiring treatment for latent tuberculosis infection notified in 2021, end of 2022



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 drug was 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 10,235 newly notified tuberculosis patients in 2022, as drug of choice at the start of treatment, 6,049 (59.1%) were on 4-drug combination therapy including INH, RFP, PZA plus EB or SM, 136 (1.3%) on 3 or more drugs including INH, RFP, and PZA, and 3,117 (30.5%) on 3 or more drugs including INH and RFP but not 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 percentage of treatments that included PZA trended downward (**Figure 9-1**).

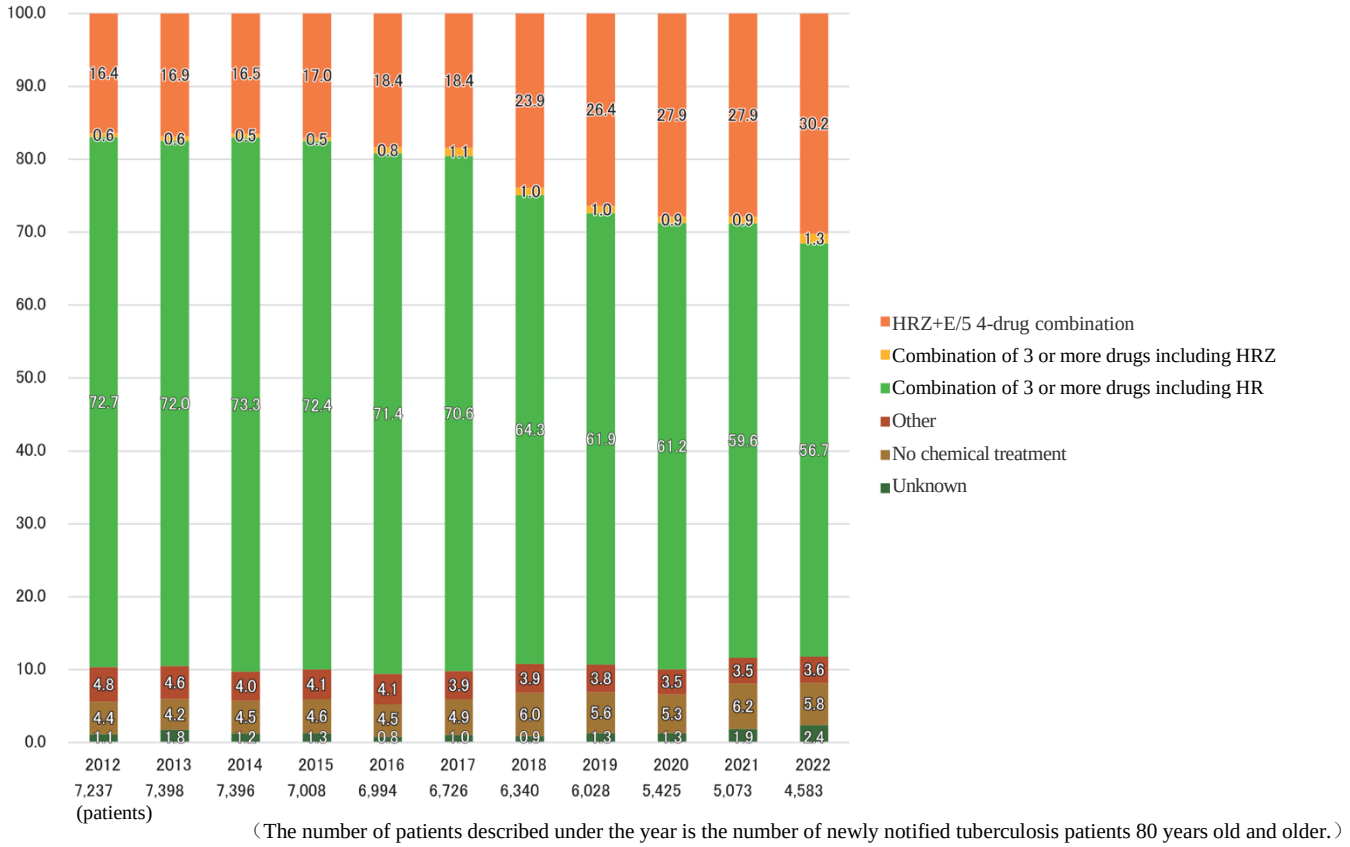
Figure 9-1 Percentage of treatment content at the beginning of treatment for newly notified tuberculosis patients by age group, 2022

H: isoniazid, R: rifampicin, E: ethambutol, S: streptomycin, Z: pyrazinamide

The proportion of patients treated with three or more drugs, including PZA, was 83.8% (4,739 of 5,652) among those

79 years old and younger but was lower among those 80 years old and older, at 31.6% (1,446 of 4,538). However, the percentage was less than 20% until 2017 but has increased since 2018. (**Figure 9-2**)

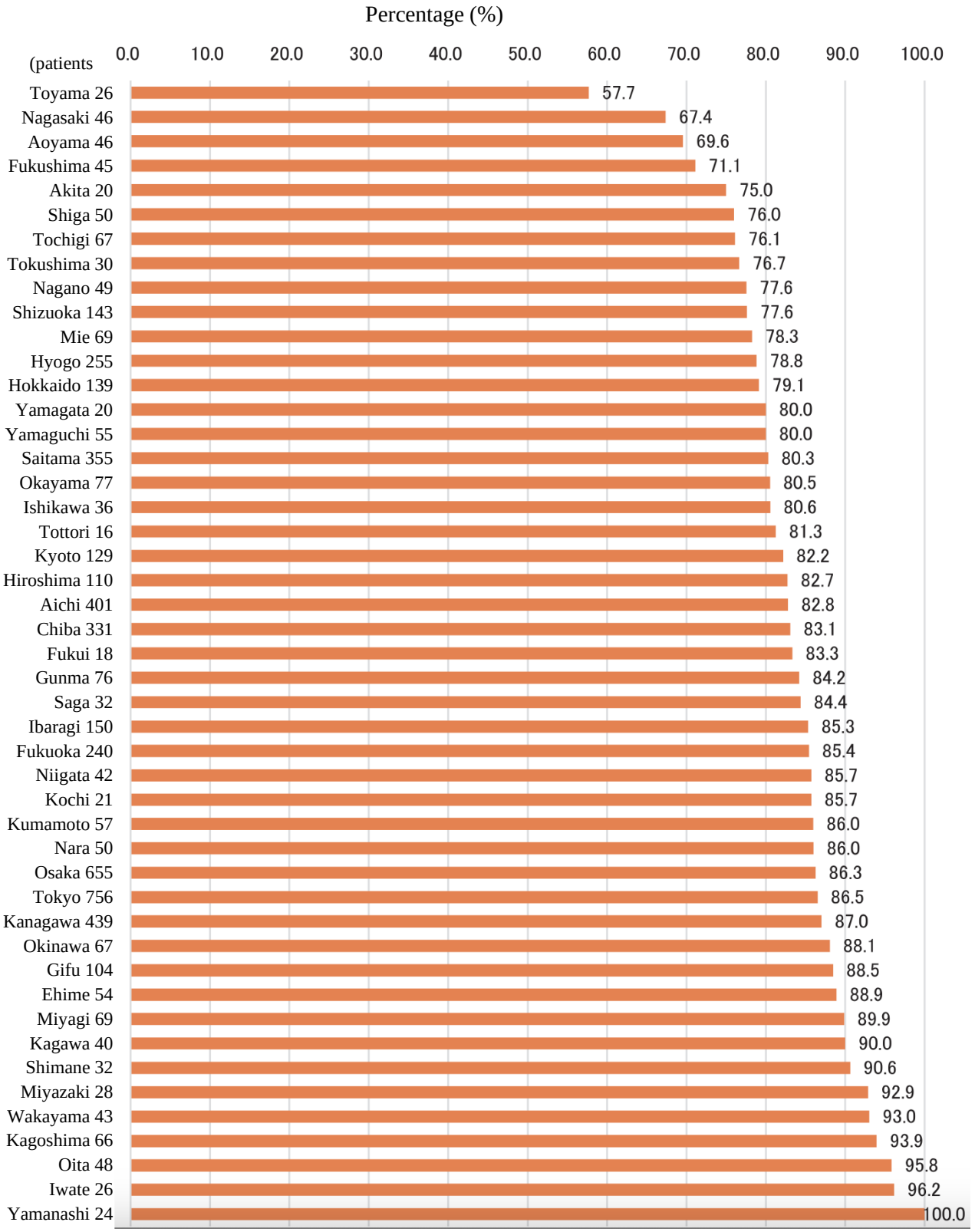
Figure 9-2　Trends in the percentage of newly notified tuberculosis patients (80 years old and older) with treatment content at the start of treatment, 2012-2022



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

However, there were significant regional differences in the percentage of patients treated with three or more drugs, including PZA, even among those 79 years and younger. **Figure 9-3** shows the percentage of newly notified tuberculosis patients aged 79 years and younger treated with three or more drugs, including PZA, by 47 prefectures. The highest rate was 100.0% in Yamanashi Prefecture, while the lowest rate was 57.7% in Toyama Prefecture, a gap of more than 40 percentage points.

Figure 9-3 Percentage of newly notified tuberculosis patients aged 79 years and younger treated with 3 or more drugs, including PZA, by Prefecture, 2022



Number of patients by prefecture name is the number of newly notified tuberculosis patients 79 years old and younger

Duration of hospitalization

The duration of hospitalization for tuberculosis is stipulated in the Infectious Disease Control Law "Handling of Admission, Discharge, and Restriction of Employment for Tuberculosis Patients" 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 4,141 newly notified tuberculosis patients who started inpatient treatment and later discharged in 2021. The distribution of hospital stays tends to be longer for sputum smear-positive cases and shorter for smear-negative cases and extrapulmonary tuberculosis cases.

The median length of hospital stays for pulmonary tuberculosis patients who started inpatient treatment was 68 days for those notified in 2009 but gradually shortened to 64 days for those notified in 2021. (**Figure 9-5**)

Figure 9-4 Distribution of length of hospitalization among newly notified tuberculosis patients who started inpatient treatment in 2021 with the known length of discharge by activity category, end of 2022

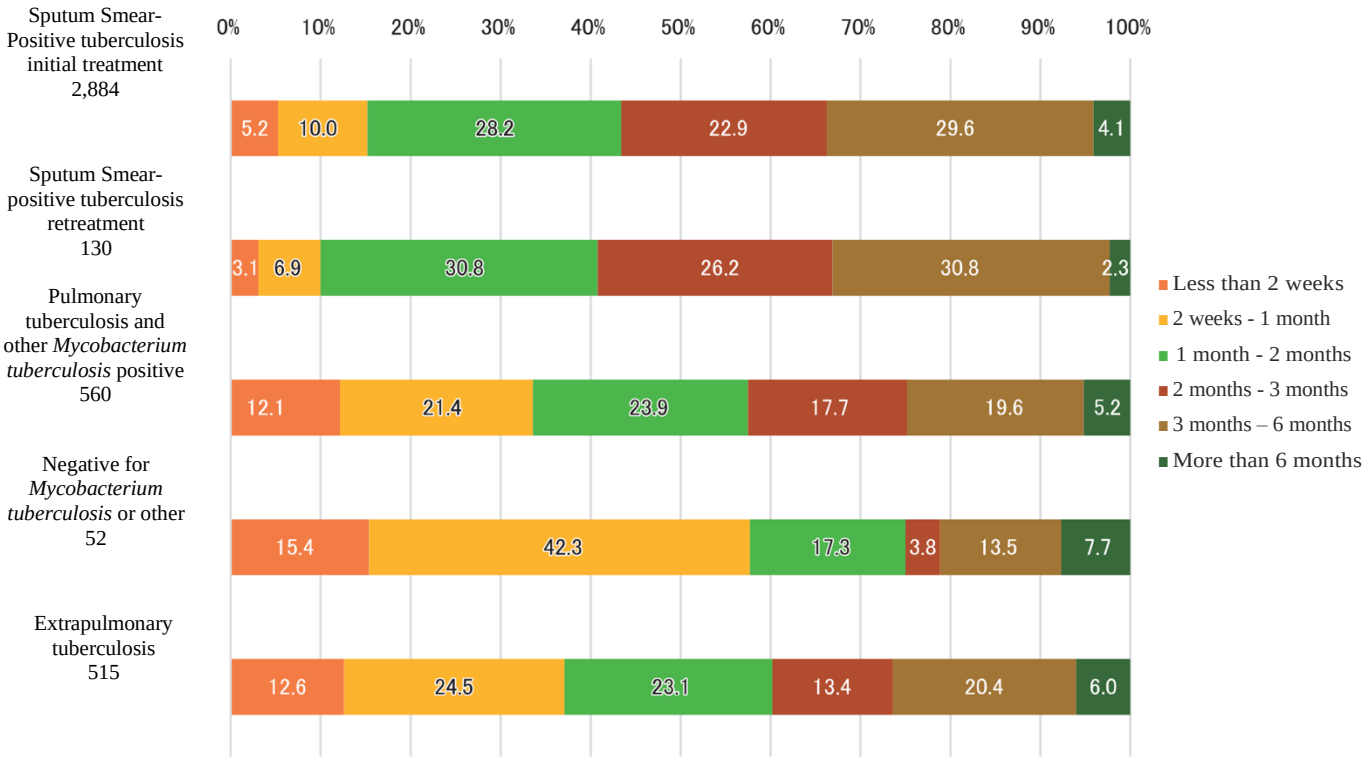


Figure 9-5 Trends in the central value of hospitalization days for newly notified tuberculosis patients with pulmonary tuberculosis hospitalized at notification, 2007-2022

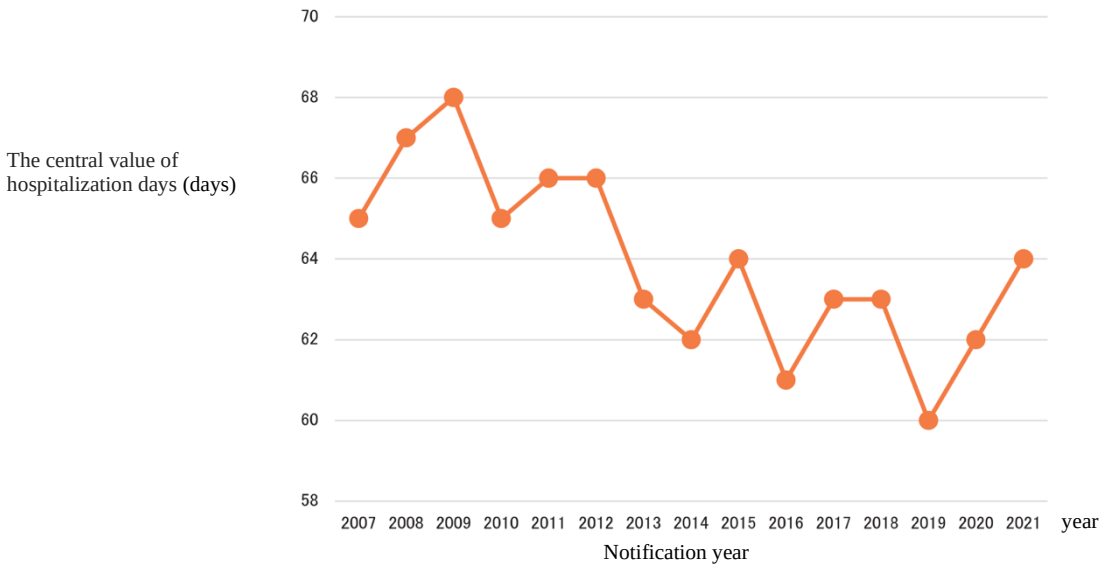
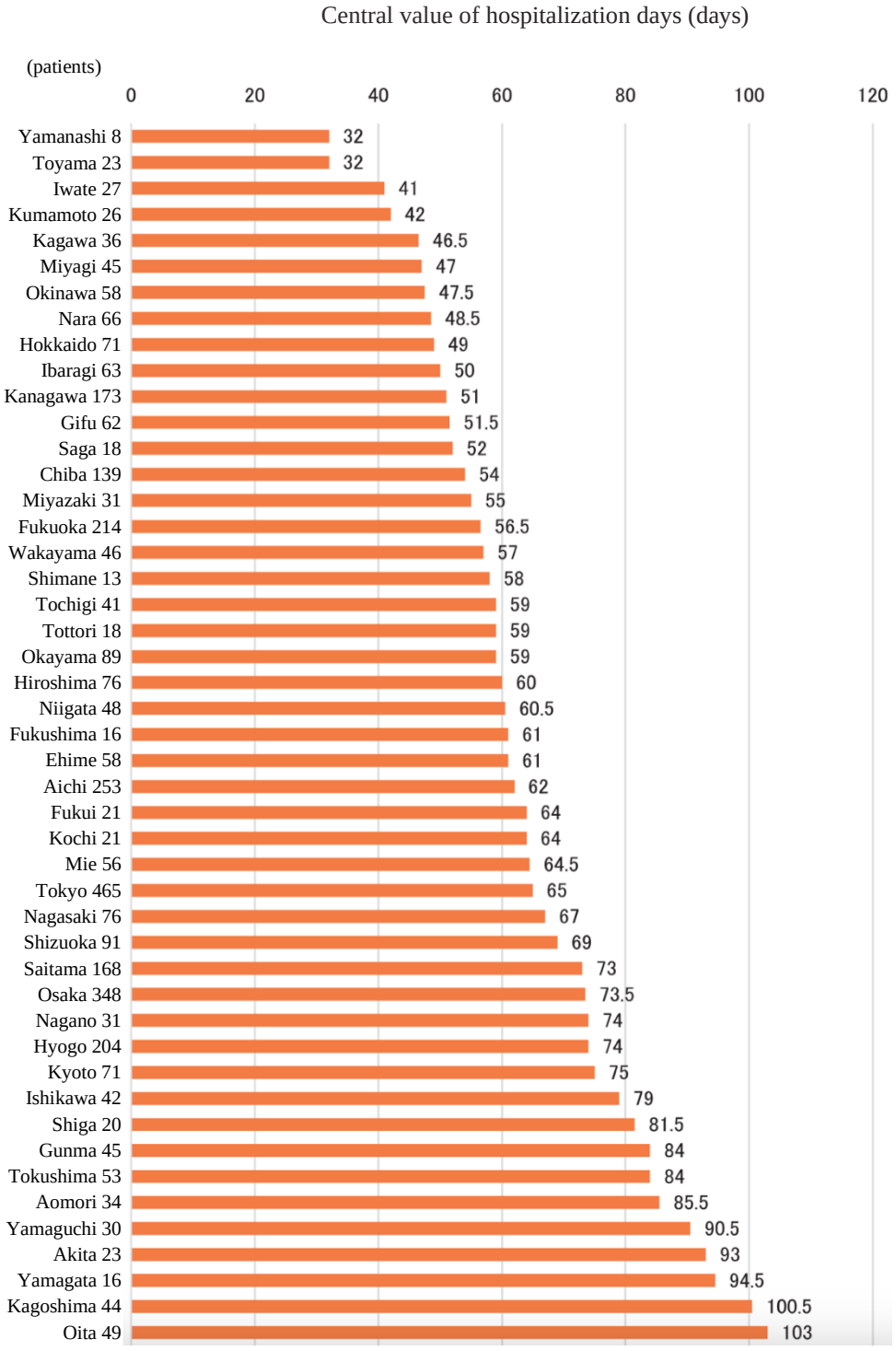


Figure 9-6 shows the median number of hospitalized days among newly notified pulmonary tuberculosis patients who started inpatient treatment in 2021 by Prefecture. The median number of hospitalization days varied widely among Prefectures, ranging from 32 days in Yamanashi and Toyama Prefectures, the shortest prefectures, to 103 days in Oita Prefectures, the longest Prefecture. The prefectures with the most extended hospital stays last year tended to have the most extended hospital stays this year as well, reflecting differences not only in the conditions of patients but also in the attitudes of healthcare providers.

Figure 9-6　Central value of hospitalization days for newly notified pulmonary tuberculosis patients who started inpatient treatment in 2021, by prefecture, end of 2022

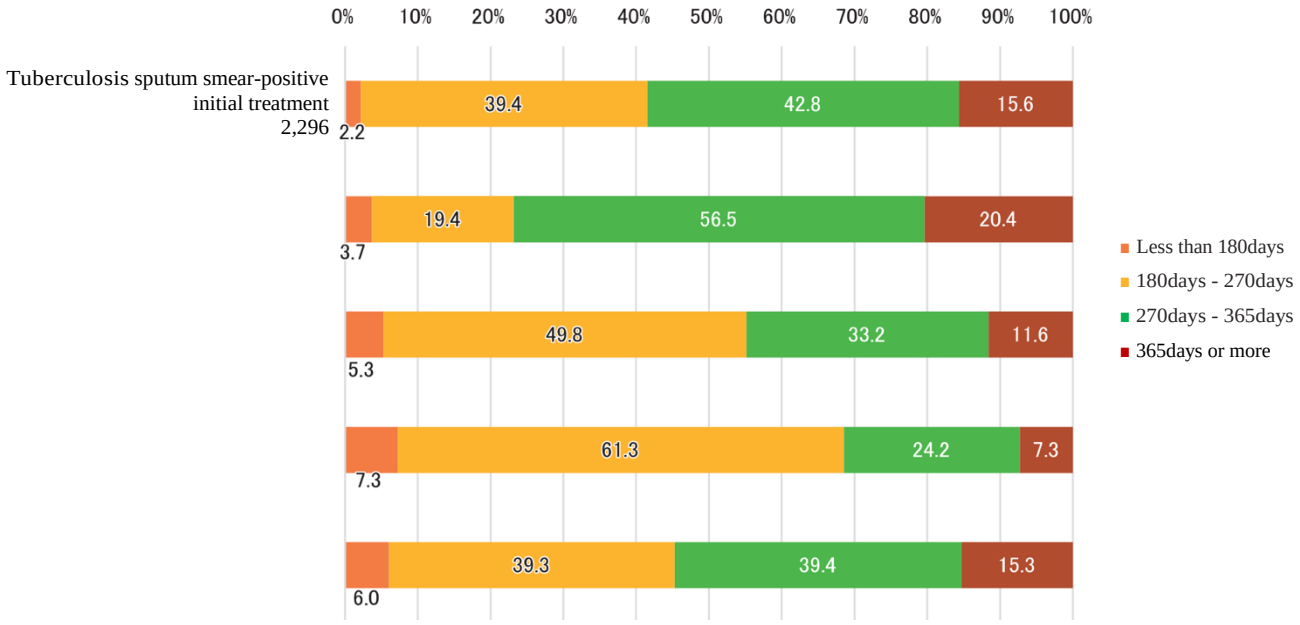


The number of patients by prefecture name is the number of pulmonary tuberculosis patients who were discharged from the hospital and whose hospitalization days were known among those who started inpatient treatment.

Number of days of treatment

The number of days of treatment is determined by the choice of drugs according to the guidelines for tuberculosis treatment, but 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 2020 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 9-7 Distribution of treatment duration among newly notified tuberculosis patients successfully treated in 2021 by activity category, end of 2022



10 Treatment Outcomes for Tuberculosis Patients

Overall trend

Figure 10-1 shows treatment outcomes by sex for the 11,495 newly notified tuberculosis patients in 2021 at the end of 2022. In total, 19.3% (2,219) were cured, 44.9% (5,159) treatment completed, 25.5% (2,935) died, 0.1% (10) failed, 1.7% (199) lost to follow up, 2.6% (297) transfer out, 5.6% (648) were still on treatment, and 0.2% (28) were unknown. The rate of treatment success was 64.2% (7,378 patients), including cured and treatment completed.

The treatment success rate by gender tended to be higher for women: 62.2% (4,169 of 6,701) for men and 66.9% (3,209 of 4,794) for women.

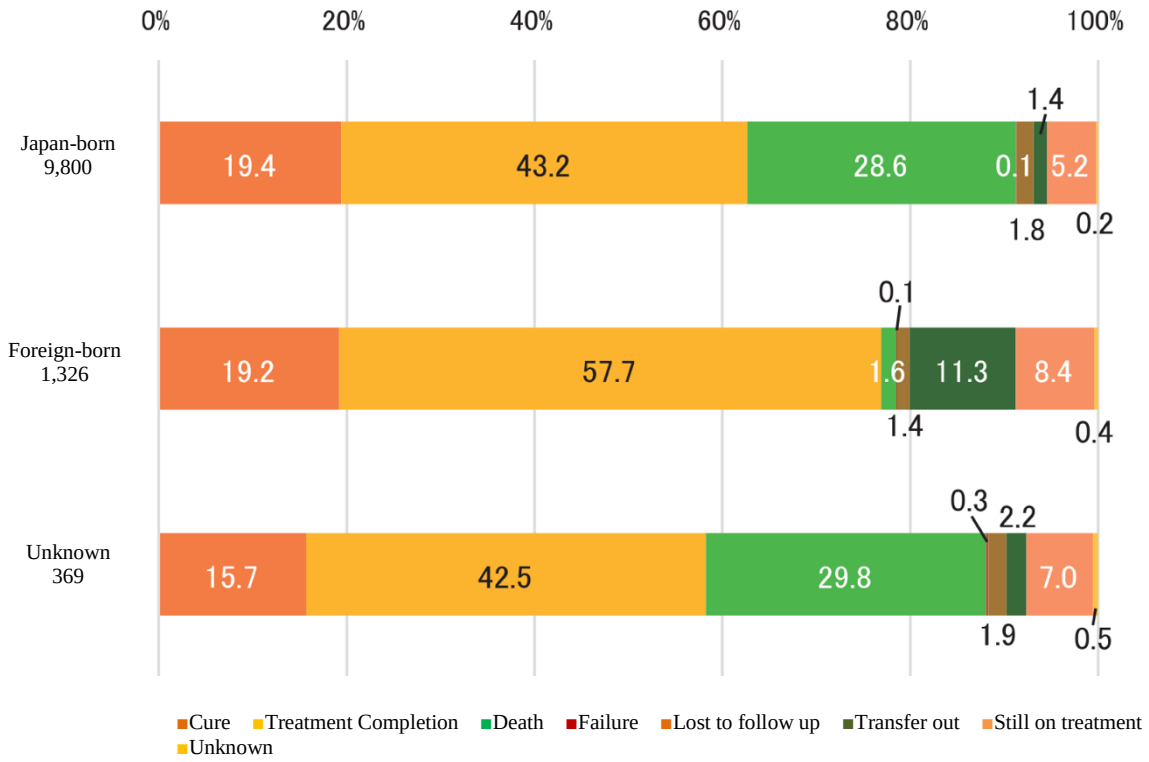
Figure 10-1 2021 Cohort treatment outcomes for newly notified tuberculosis patients, by gender, at the end of 2022

Trends by country of birth

Figure 10-2 shows treatment outcomes by country of birth (Japan-born, foreign-born, and unknown country of birth) for newly notified tuberculosis patients in 2021 as of the end of 2022. The success rate of tuberculosis treatment was 62.7% (6,143 out of 9,800) for patients born in Japan and 76.9% (1,020 out of 1,326) for those born outside Japan, with a higher success rate for those born outside Japan. The reason for the low treatment success rate among Japan-born tuberculosis patients is that the rate of death is exceptionally high among the elderly (see **Figure 10-3**). On the other hand, 11.3% (150 patients) of the foreign-born transferred out during treatment, which was higher than the 1.4% (139 patients) of the Japanese-born who transferred out.

Figure 10-2 2021 Cohort treatment outcomes for newly notified tuberculosis Patients, by country of birth,

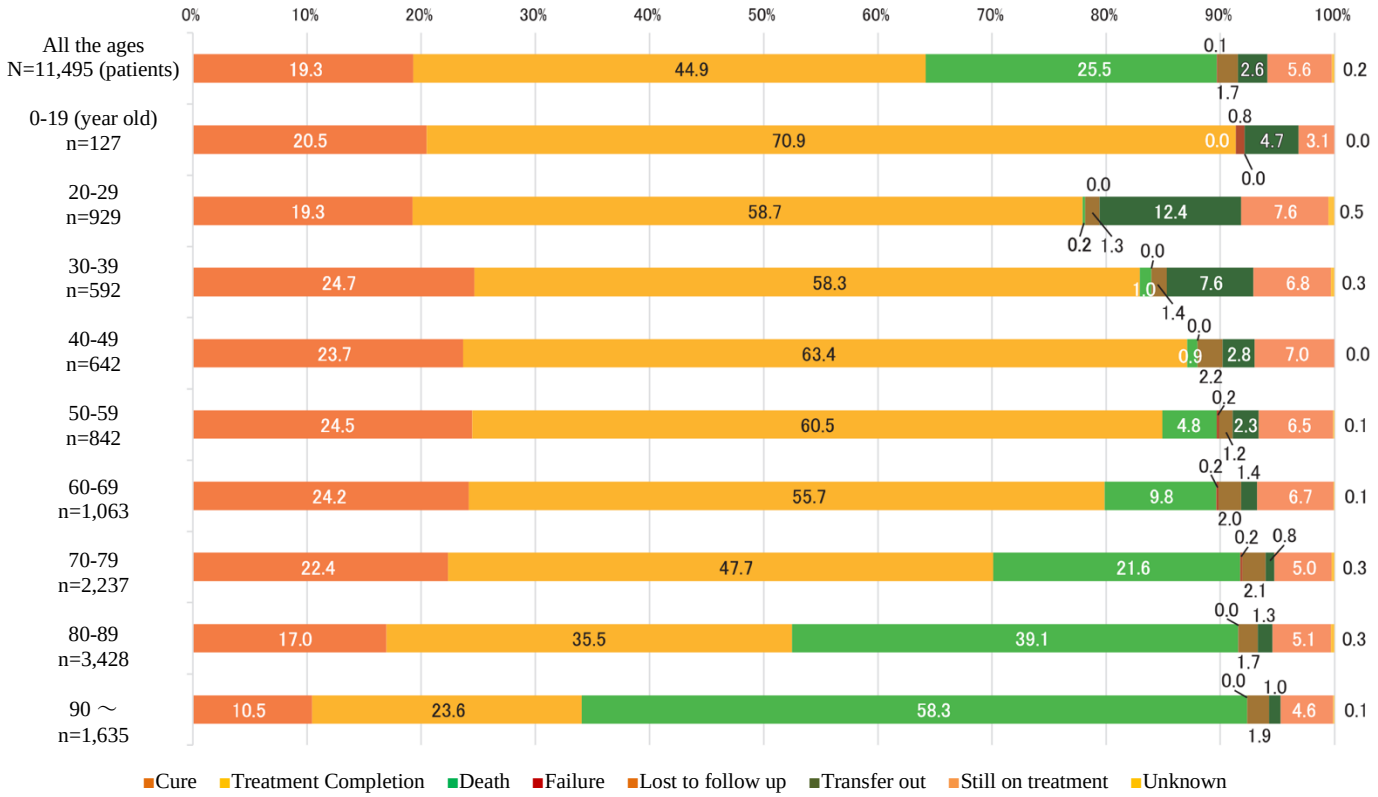
at the end of 2022



Trends by Age Group

Figure 10-3 shows the treatment outcome by age group of newly notified tuberculosis patients in 2021. 77% or more of the patients in the age group of 69 years and younger were successfully treated, while the rate of death increased in the age group of 70 years old and older. The rate of death among the elderly was 39.1% (1,340 of 3,428 patients) in the 80-89 age group and 58.3% (953 of 1,635 patients) in the 90 and older age group.

Figure 10-3　2021 Cohort treatment outcomes for newly notified tuberculosis patients, by age group, at the end of 2022



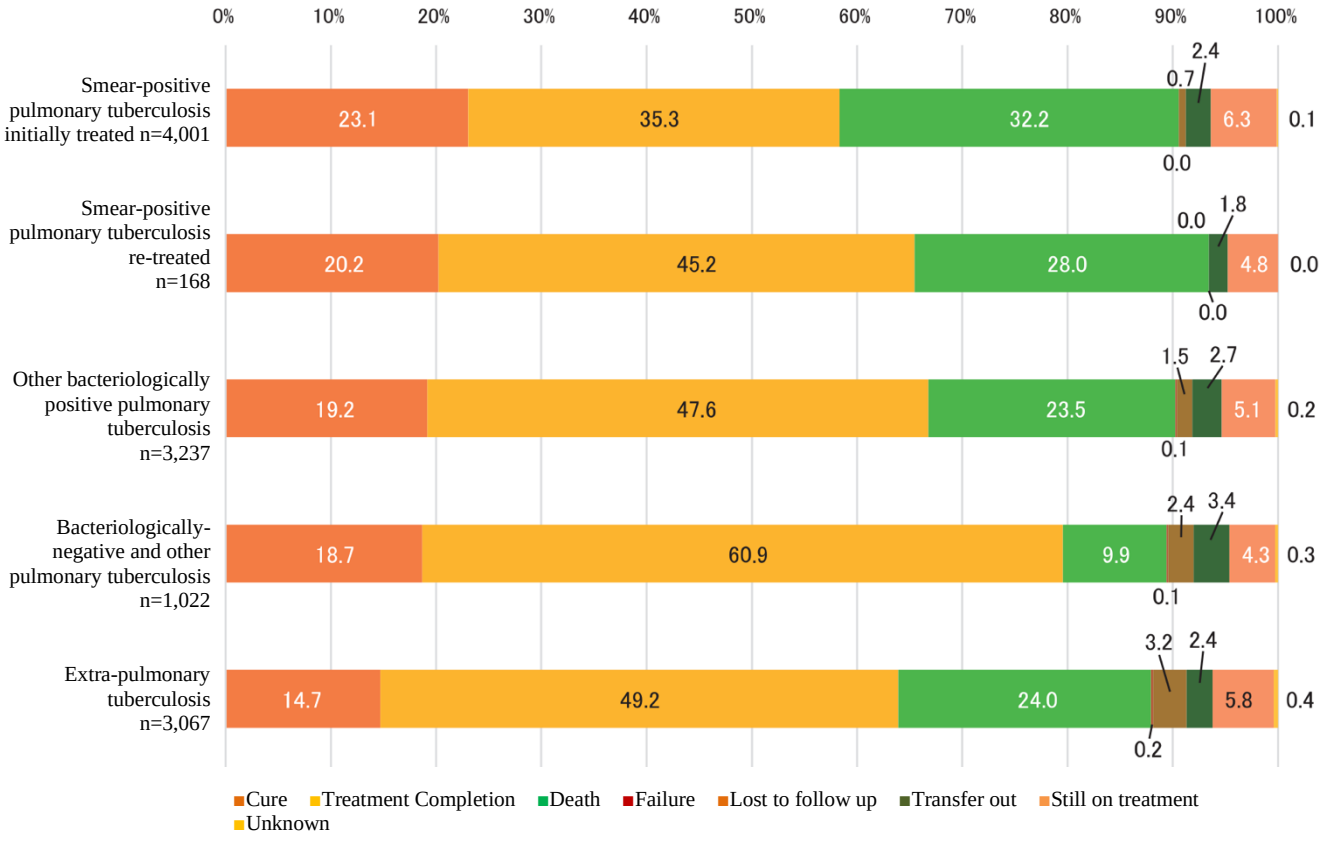
Trends by Patient Classification at the Time of Enrollment

Figure 10-4 shows treatment outcomes by patient classification for newly notified tuberculosis patients in 2021 at the end of 2022. The treatment success rate among the 4,001 patients with sputum smear-positive pulmonary tuberculosis treated initially was 58.3% (2,334 patients), and among the 168 patients with sputum smear-positive pulmonary tuberculosis re-treated, the treatment success rate was 65.5% (110 patients).

The treatment success rate in the 3,237 other bacteriologically-positive pulmonary tuberculosis patients was 66.8% (2,161 patients), showing a trend toward higher treatment success rates than in the sputum smear-positive pulmonary tuberculosis patients initially treated.

The treatment success rate among the 1,022 bacteriologically-negative pulmonary tuberculosis patients was 79.5% (813 patients), higher than that of other pulmonary tuberculosis patients. This is due to a low mortality rate of 9.9% (101 patients) during treatment, which is partly attributed to the younger age structure of the patients (the mean age of patients with sputum smear-positive pulmonary tuberculosis initially treated was 73 years, and that of patients with bacteriologically-negative pulmonary tuberculosis was 57 years).

Figure 10-4 2021 Cohort treatment outcomes for newly notified tuberculosis patients, by patient category, at the end of 2022



Treatment Outcomes for Patients with Multidrug-Resistant Tuberculosis

Figure 10-5 shows the treatment outcomes at the end of 2022 for 55 newly notified tuberculosis patients with multidrug-resistant

tuberculosis who were resistant at least to both INH and RFP in 2020 (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 70.9% (39 patients), the death rate was 18.2% (10 patients), while the lost-to-follow-up rate was 0.0% (0 patients). When the age was divided into 59 years old and younger (36 patients) and 60 years old and older (19 patients), the treatment success rate for those 59 years old and younger was 83.3% (30 patients), and there was only one case of death. The success rate of treatment was 47.4% (9 patients), and the death rate was 47.4% (9 patients) in patients aged 60 years old and older, and the percentage of deaths was high. Among patients aged 59 years and younger, 11.1% (4 patients) transferred out during the treatment, all of whom were foreign-born, and 3 of them moved out of the country.

Figure10-5 2020 Cohort treatment outcomes of newly notified multidrug-resistant tuberculosis patients, by age group, at end of 2022