



Government of **Western Australia**
North Metropolitan Health Service
Mental Health, Public Health and Dental Services



Western Australian Tuberculosis Control Program

Tuberculosis notifications in Western Australia 2021

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EXECUTIVE SUMMARY

In 2021, Western Australia (WA) recorded 143 tuberculosis (TB) notifications at an incidence rate of 5.4 per 100,000. This continues a small but steady increase in the number of notifications of about 3% per year over the preceding 5 years, though this change is not statistically significant. The WA rate is just below the national TB incidence rate for 2021 (5.7/100,000) and is amongst the lowest of rates globally. However, the lack of decline in TB incidence remains contrary to the national and local strategic intent of 'Towards Disease Elimination'. It is perhaps also contrary to expectation after 2 years of international border closure due to the COVID 19 pandemic. This may be explained by a delay in the effect of border closure (overseas students, for example, renew their visas after 2 years, which is often when TB is diagnosed) or additional TB in family and other short term visitors that were required to renew their visas because they could not leave Australia.

The demographics of people with TB in WA have not changed from recent years and are as expected, apart from 2 variables. Firstly, more TB notifications in WA were female (56%). Whilst possibly just a chance event, this has persisted for 4 years and is counter to a slight male preponderance seen both nationally and internationally. Secondly, TB notifications in 2021 were older than in prior years. Aside from the usual peak in incidence rate in young adults (25 to 34 years), there were equivalent peaks in the rates for people 55 to 64 and 75 to 84 years. This may have been due to the forced renewal of short-term visas amongst visitors mentioned above, as these people tend to be older.

Nearly all the people notified with TB in 2021 (92%) were migrants, largely from countries with high TB prevalence, especially Asia, and with nearly half having arrived within the proceeding 5 years. This has not changed over recent years, with India and the Philippines consistently contributing the largest number. However, Bhutanese migrants, who mainly immigrate for tertiary education in WA, have become a significant contributor to TB numbers and Bhutan is the country of origin with the highest incidence rate. These data remain the best predictor of risk of TB in the clinical setting. In 2021, amongst migrants notified with TB there were fewer tertiary students (though still a large group) and overseas visitors, and more permanent residents than previous years, which is likely to be a function of the closed international border.

Delay in the diagnosis of TB remains a concern, with 41% of notifications starting treatment more than 90 days after initial contact with the health system. The median delay was 69 days, 7 days longer than in 2020, and when notifications are categorised according to a matrix that considers the adverse personal or public health consequences of delay, 52% are considered delayed. Also of concern is that this delay appears to be worse in TB patients diagnosed outside of Perth, though this is amongst fewer patients. As expected, extra-pulmonary TB diagnosis has a longer median health system delay, because it is generally harder to diagnose. However, delay

in the diagnosis of pulmonary TB has higher consequence and so is more often classified as delayed than extra-pulmonary TB. This in turn relates to a high and rising proportion of pulmonary TB notifications that were smear positive on sputum microscopy (67%), which is a marker of more advanced and more infectious disease.

Health care workers continue to contribute significantly to TB incidence, with 13 notifications in 2021. The consequent contact tracing in their work setting revealed some cases of latent TB infection, but there was no evidence of secondary active TB from these workers or that they acquired TB from their workplace in WA. In 2021 the Australian Department of Home Affairs introduced a new requirement for health care workers entering Australia to have a test for latent TB infection (LTBI) premigration. Migrants diagnosed with LTBI are issued a Health Undertaking and referred to the TB Program. This has offered an opportunity to provide preventive therapy to this cohort shortly after arrival, so it will be interesting to see if this reduces TB incidence in this group in future reports.

The WA Tuberculosis Control Program continues to report a very high success rate in treatment of TB. In 2020, 99% of assessable cases completed treatment successfully with one patient defaulting from treatment, and in 2021 there were only 3 cases of TB recurrence, only one of which had been treated in Australia.

Diagnosis and treatment of LTBI is a focus for the TB Control Program, with a view to reduction in TB incidence through prevention. After a significant rise in this activity in the years prior to 2019, the number treated for LTBI, all through the Anita Clayton Centre in the Perth city centre, has remained stable. This included 147 contacts of active cases from amongst 178 contacts (14% of all contacts tested) that were diagnosed with LTBI. The TB Program recognises that treating LTBI needs to substantially expand to have any impact on TB incidence in WA and, with this aim, is undertaking a pilot project introducing the diagnosis and treatment of LTBI into primary care practices.

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Acknowledgements: This report is largely based on data drawn from the TB notifications in the WA Notifiable Infectious Diseases Database (WANIDD), which is maintained by the Communicable Diseases Control Directorate. The raw data is collected by TB case managers. Data cleaning, preparation of tables and figures, data analysis and report writing were done by Dr Hussein Farah. The report has been reviewed and endorsed by the Western Australian Tuberculosis & Leprosy Advisory Council (WATLAC).

TB in WA: 2021 SNAPSHOT

	2021	Compared to 2020
Number of notifications	143	↑ 3.6%
Incidence rate	5.4/100,000	↑ 3.8% ¹
Rate in Australian-born population	0.7/100,000	No change ¹
Rate in Indigenous population	2.3/100,000	↓ 5.7% ¹
Rate in overseas-born population:	13/100,000	↑ 5.3% ¹
Geospatial distribution	31 LGA's	↑ 10.7%
Rate in metropolitan Perth area	6.2/100,000	↑ 1.6% ¹
Rate in regional areas	2.4/1000,000	↑ 9.5% ¹
Health System Delay (Median)	69 (days)	↑ 11.3%
Culture confirmation	73% (n=104)	↓ 3.9%
Resistance to any first line drug	13% (n=13)	↓ 13.3%
MDRTB	4% (n=4)	↑ 100.0%
Genotyping (WGS)	100% of positive culture	No change
Cluster rate	7% (n=7)	↓ 12.5%
TB in Health Care Workers	9% (n=13)	No change
Pulmonary TB smear positive	5 cases	No change
Treatment Outcome (2020)	99% success rate	↑ 3.0% (2019)
Case fatality rate	0%	No change
Latent TB Treatment	90% (n=392) completion rate	↓ 1.5%
Contact investigation	2189 contacts identified	↑ 72.2%
No TB infection or disease	81%	↑ 11.7%
LTBI	13%	↓ 39.7%
Secondary TB	0.6%	↓ 40.0%

¹ Population data is based on Australian Bureau of Statistics (ABS) census and intercensal estimates that are updated regularly. Therefore, rates may differ from those previously reported.

DATA SOURCES

Tuberculosis notifications:

Tuberculosis (TB) notification data recorded on the Western Australian Notifiable Infectious Diseases Database (WANIDD), is used in this report. Under the *Public Health Act 2016*, medical practitioners, including laboratory pathologists are required to notify TB cases to the Western Australia (WA) Department of Health Communicable Disease Control Directorate. Notification data includes information such as the type of TB, case demography, clinical details, laboratory results, risk factors and some case management detail.

The total number of TB cases is based on persons who were in WA at the time of diagnosis. Persons diagnosed in other parts of Australia or abroad, who moved into WA, were excluded. Treatment outcomes are given for cases notified in the previous year (2020), because of the length of time taken for the treatment of TB to be completed.

Population data used to calculate disease rates in this report has been derived from the Australian Bureau of Statistics (ABS) 2021 census data. Molecular typing data is provided by the WA Mycobacterium Reference Laboratory (MRL). Most TB culturing and all TB isolate identification and molecular typing in WA is undertaken by the MRL.

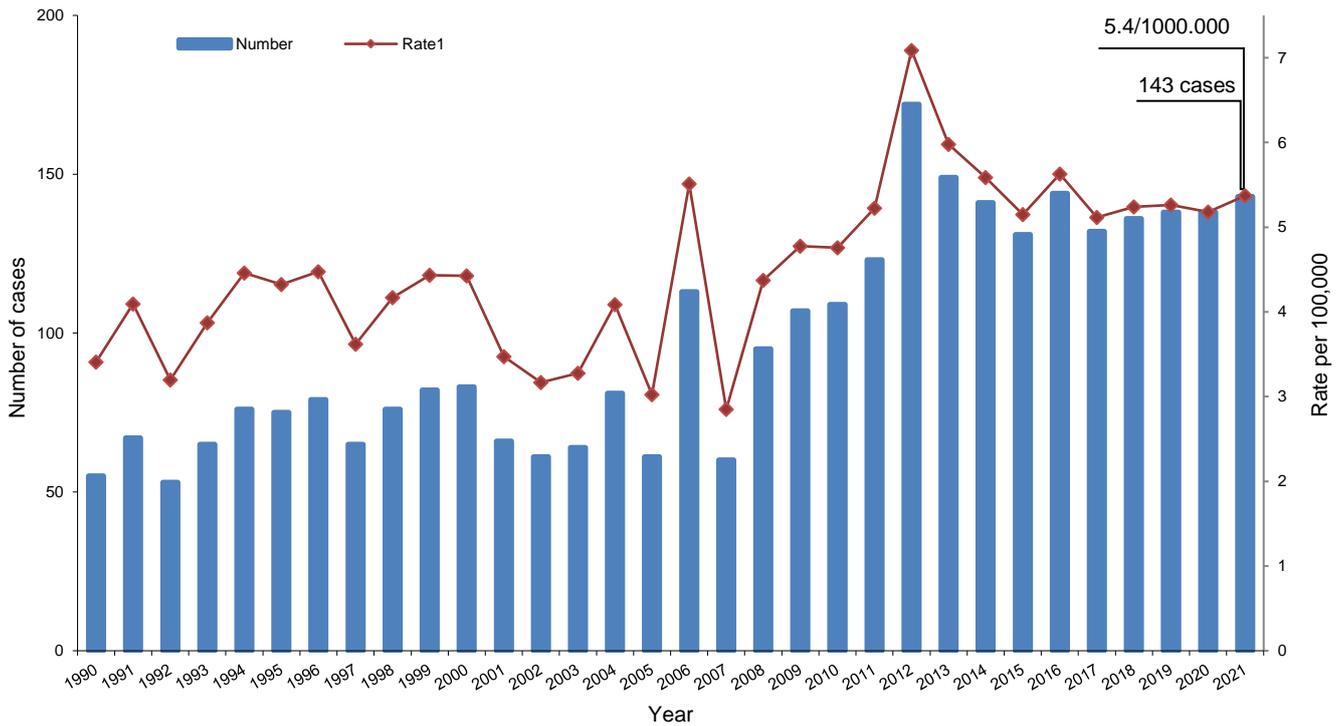
Latent Tuberculosis Infection and Contact Investigation:

Data presented in this report is collated and extracted from the WA TB Control Program (WATBCP) working databases. These are data collection tools setup primarily to assist with TB case managers' workload. Measures to ensure the uniformity and completeness of the data collection sheets were introduced to maintain and enhance data quality.

TUBERCULOSIS IN WESTERN AUSTRALIA

In 2021, there were 143 cases of active tuberculosis (TB) notified in Western Australia (WA), an increase of 3.6% since 2020. The WA TB incidence rate was 5.4 per 100,000 population.

Figure 1: Tuberculosis notifications numbers and rates, WA, 1990-2021



1990-2000:

Overall increase: 51%
Average annual increase: 5.3%

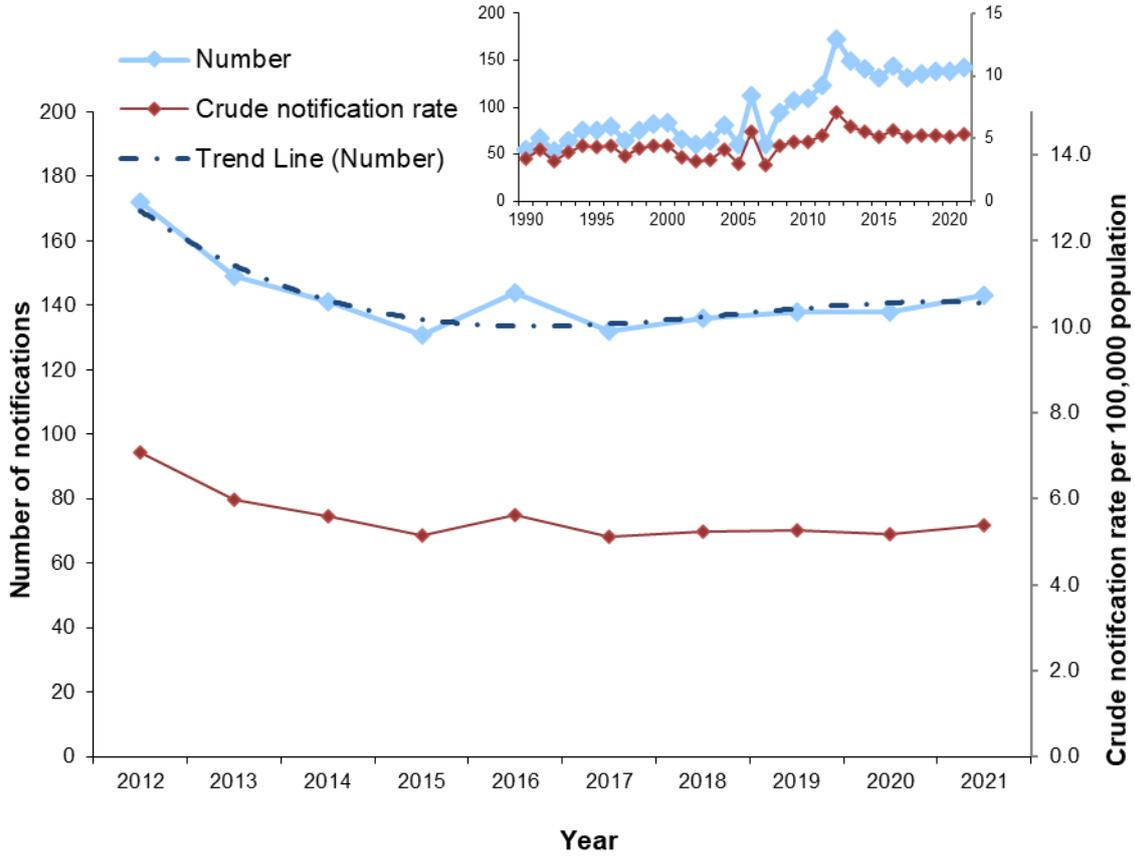
2000-2010:

Overall increase: 65%
Average annual increase: 9.0%

2010-2021:

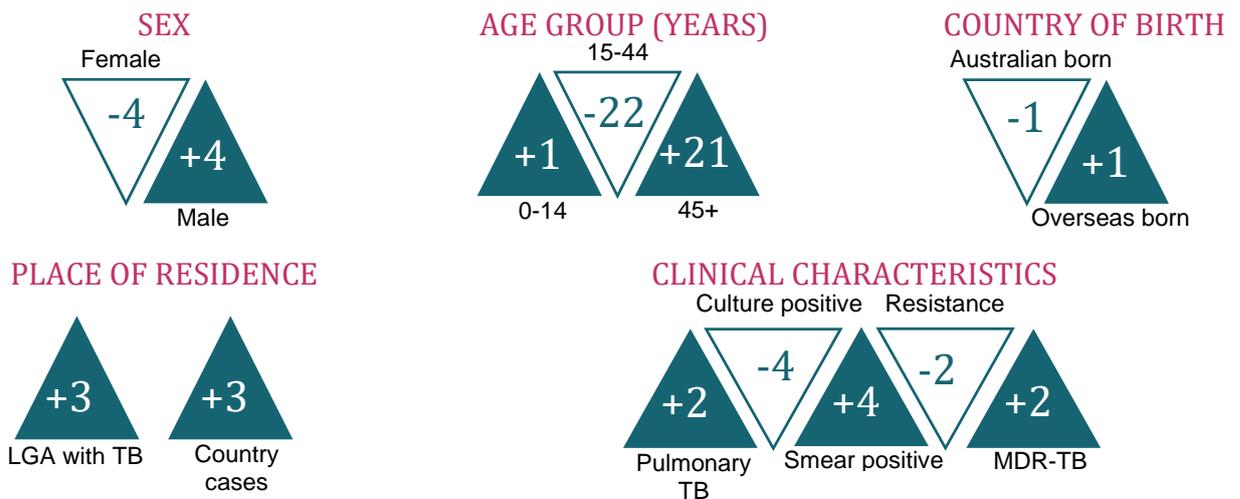
Overall increase: 16%
Average annual increase: 3.3%

Figure 2: Tuberculosis notifications numbers and rates, WA, 2012-2021



The number of notifications in 2021 was the highest recorded in a year since 2016. While TB cases and rates remain significantly higher than the overall trend noted since 1990, the increase in both crude notification numbers and rates from 2010 to 2021 was not statistically significant.

Figure 3: Percentage point change for selected TB case characteristics, WA 2020-2021



DEMOGRAPHIC CHARACTERISTICS

Age and Sex

Figure 4: Tuberculosis by Sex and age-group and sex, WA 2021

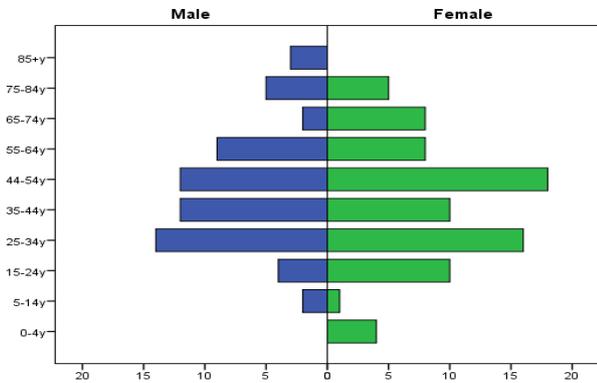
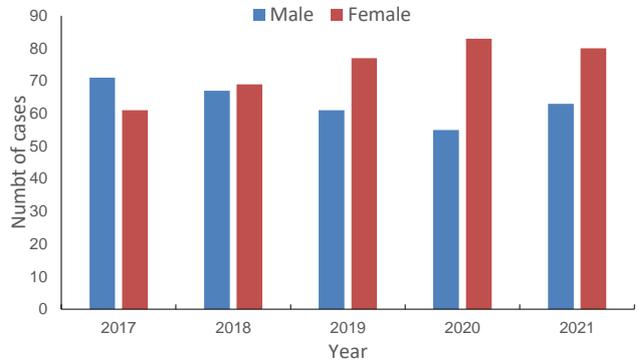


Figure 5: Tuberculosis by sex distribution, WA 2017-2021



The female predominance noted since 2018 continued with females representing 56% (n=80) of notified TB cases and male to female ratio of 1:1.3. Although this gender difference was not statistically significant, it was a reversal of the global and national trends that consistently show male predominance among TB patient.

Figure 6: Tuberculosis by age group, WA 2017-2021

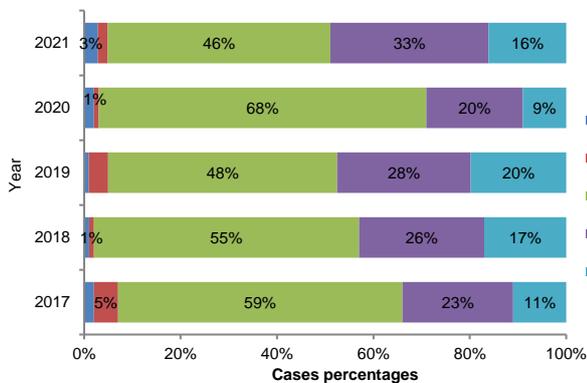
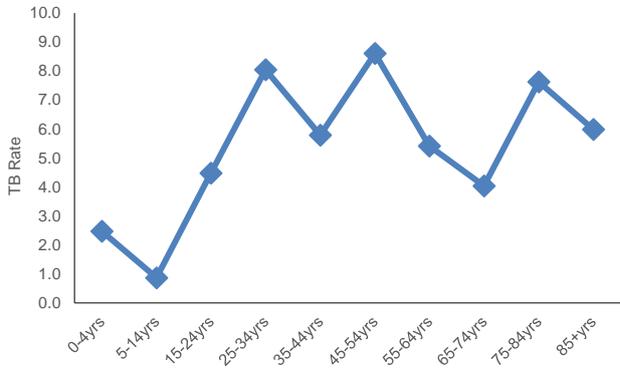


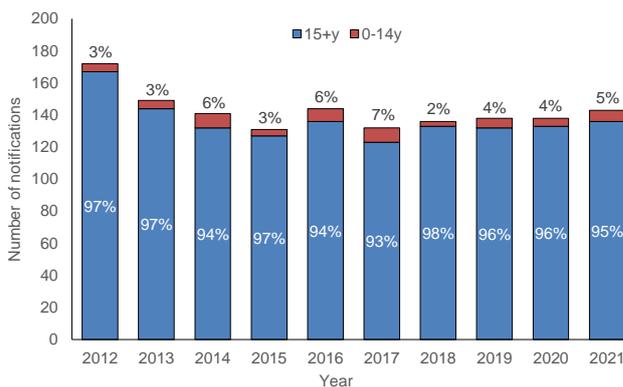
Figure 7: Tuberculosis rates by age-group, WA 2021



The overall age distribution showed an older cohort in 2021 with a median age of 44 years (range 1-94 years) compared to 34 years in 2020. The notification rates by age group showed 3 peaks, observed in the 25-34 year age group (n=30, rate=8.0/100,000), the 45-54 year age group (n=30, rate=8.6/100,000) and the 75-84 year age group (n=10, rate=7.6/100,000). The median age among males was 44 years (range 5-94 years) and the median age among females was 41 years (range 1-84 years).

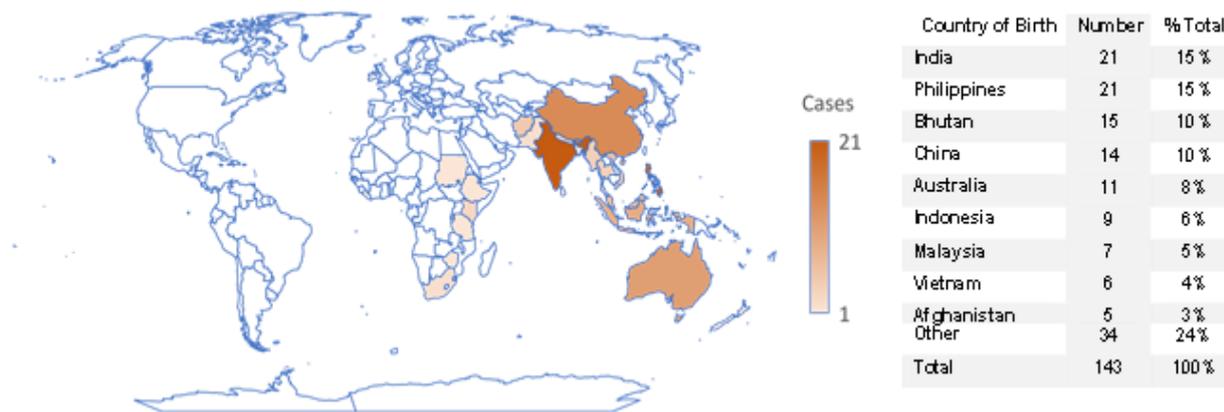
The number of TB cases among children less than 15 years of age increased to 5%, (n=7) with a rate of 1.4 per 100,000 population compared to the national rate of 1.1/100,000 in this age group. Six children were Australian born and were all secondary TB cases linked to household adult cases. The remaining child was overseas born and was a new TB case with no source identified.

Figure 8: Percentage of total TB notifications that are children, WA 2012-2021



Country of Birth

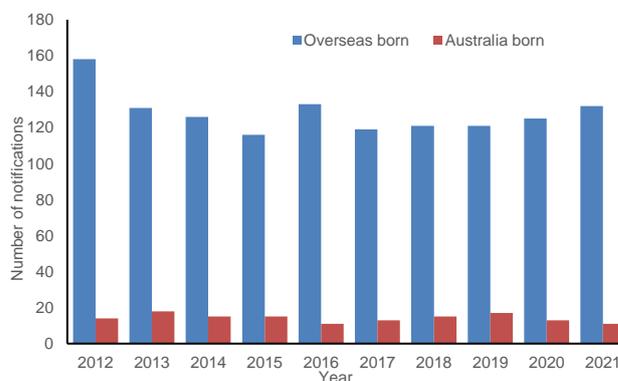
Figure 9: Tuberculosis cases by place of birth, WA, 2021



The 2021 TB cases had 29 countries of birth recorded with 92% (n=132) born overseas. The majority originated from TB high burden countries with the most recorded countries of birth being India (15%, n=21), Philippines (15%, n=21), Bhutan (10%, n=15) and China (10%, n=14).

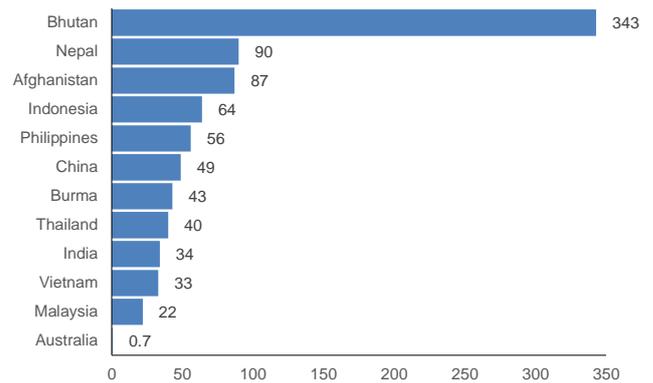
The proportion of TB in the Australian born population decreased to 8% (n=11) from 9% in 2020, with a stable incidence rate of 0.7 per 100,000. Of the 11 Australian born TB cases, two were Aboriginal with an incidence rate of 2.3 per 100,000, representing 1% of the total TB case load and 18% of those born in Australia. In 2020, two TB cases were identified as Australian Aboriginal representing 15% of the Australian born caseload.

Figure 10: Tuberculosis cases by place of birth, WA, 2012 – 2021



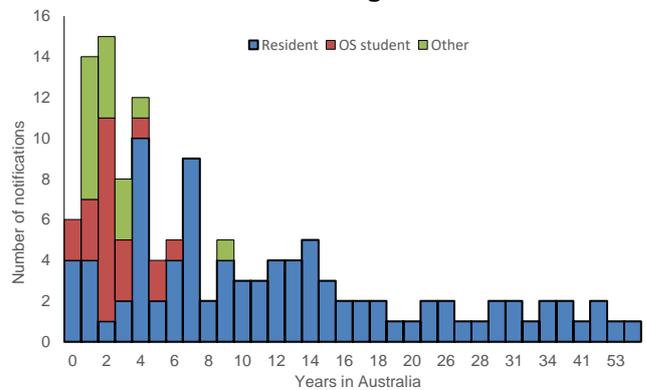
TB notification rates for the countries with the highest number of cases is presented using the 2021 census data. Rates varied from 0.7/100,000 for Australian born cases to 343/100,000 for Bhutanese born cases. The notification rate for all overseas born cases was 13.0 per 100,000 population.

Figure 11: Tuberculosis rates by place of birth, WA 2021



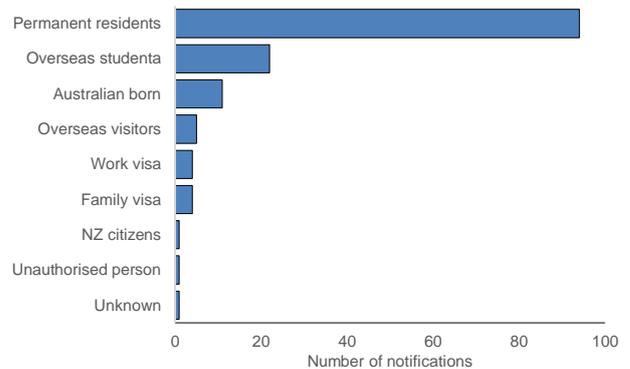
The interval between the date of arrival in Australia and TB notification date ranged from 0 to 55 years, with a median interval of seven years (range 2-14 years). Time since entering Australia showed that 27% (n=35) were diagnosed within two years and 45% (n=59) within five years.

Figure 12: Overseas born cases by time in Australia and immigration status



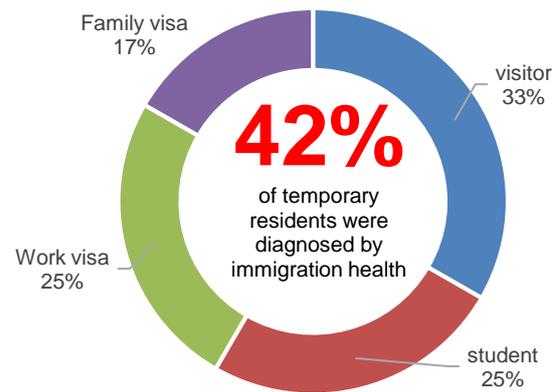
The majority of the overseas born cases identified as permanent residents (71%, n=94) increasing from 58% in 2020. However, numbers of TB cases among overseas students decreased to 17% (n=22) from 20% (n=25) in 2020. Similarly, the overseas visitors numbers decreased to 4% (n=5) compared with 10% (n=12) in 2020.

Figure 13: Tuberculosis cases by immigration status, WA 2021



Of those with temporary Australian residence status (n=36), 42% (n=15) were diagnosed with TB as part of immigration health check (43% in 2020). These include four visitor visa and three student visa applicants representing 80% and 14% of cases in the respective visa categories.

Figure 14: Tuberculosis diagnosis by immigration screening, WA 2021



Place of Residence

TB was notified in 31 Local Government Areas (LGA) in 2021, (28 in 2020). The overall number of cases in country WA increased to 8% (n=12) from 5% in 2020 with an incidence rate of 2.3/100,000 (95% CI 1.0-3.6). Perth metropolitan area accounted for the remaining 92%, (n=131) of the cases with a rate of 6.2/100,000 population (95% CI 5.1-7.2).

Table 1: Tuberculosis notification numbers and rates, WA Regions 2021

Region	Number	Rate ¹ (95% CI) ²
Metropolitan Perth	131	6.2 (5.1 – 7.2)
South-West	5	2.7 (0.3 – 5.1)
Goldfields-Esperance	3	5.5 (-0.7 – 11.8)
Wheatbelt	2	2.8 (-1.1 – 6.7)
Kimberley	1	2.9 (-2.7 – 8.4)
Midwest- Gascoyne	1	1.5 (-1.5 – 4.6)
Great Southern	0	-
Pilbara	0	-

¹ Crude notification rate per 100,000 population
² 95% Confidence interval

The East Metropolitan Health Service Area had the highest number of TB cases (42% n=60). Most of the cases were concentrated in the local government areas of City of Stirling, City of Canning, City of Gosnells, City of Swan, City of Armadale and City of Wanneroo which together accounted for 49% (n=70) of all WA TB burden in 2021.

Figure 15: Tuberculosis notifications by health service area, WA Regions 2021

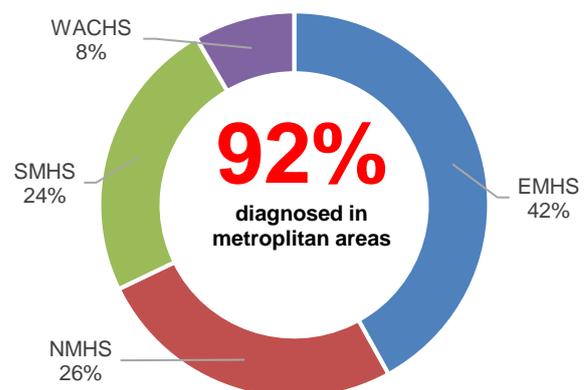
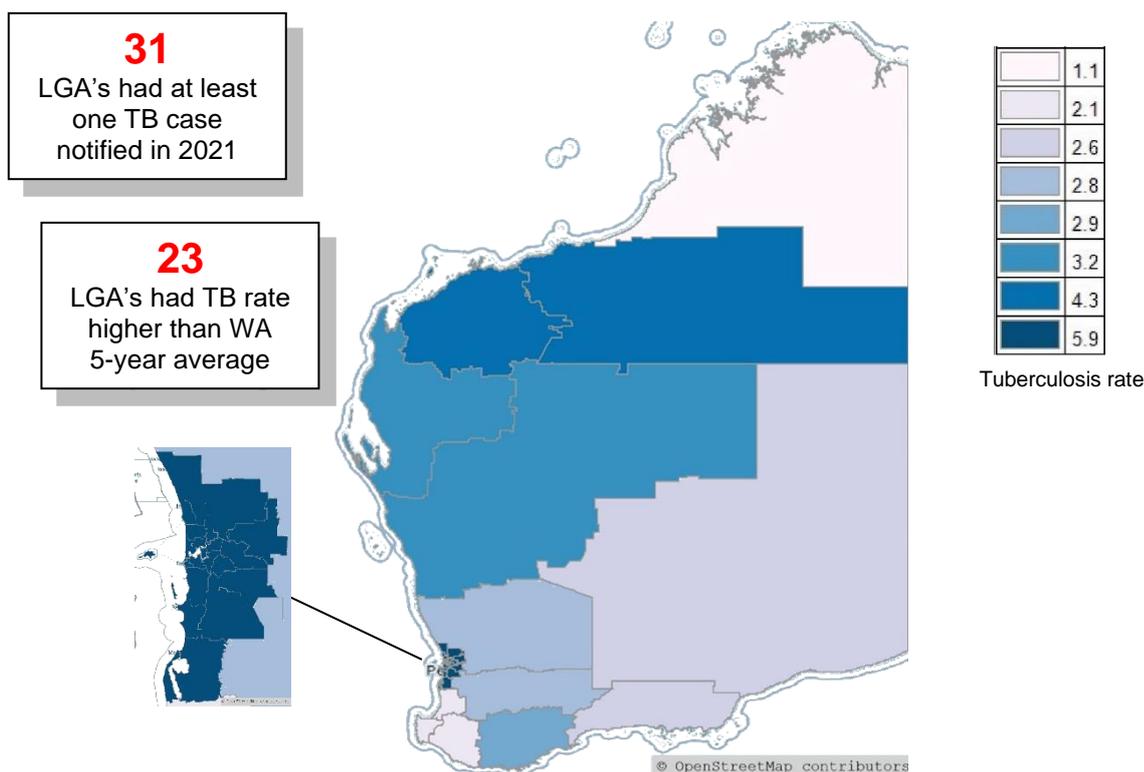


Figure 16: Five-year average tuberculosis incidence rates by WA Regions 2017-2021



The 5 years average rate of regional TB was highest in Perth metropolitan area with an average rate of 5.9/100,000 population, followed by the Pilbara (4.3/100,000), the Midwest-Gascoyne (3.2/100,000), the Great Southern (2.9/100,000), the Wheatbelt (2.8/100,000), the Goldfields-Esperance (2.6/100,000), the South-West (2.1/100,000) and the Kimberley (1.1/100,000).

Table 2: Regional comparison of tuberculosis notifications, WA 2021

		Metro	Country	P value
Age	Median (IQR)	42 (29-57)	47.5 (36-65)	>0.05
Sex	Male	58 (44.3%)	5 (41.7%)	>0.05
	Female	73 (55.7%)	7 (58.3%)	
Place of Birth	Australia	9 (6.9%)	2 (16.7.9%)	>0.05
	Overseas	122 (93.1%)	10 (83.3%)	
TB Type	PTB	77(58.8%)	7 (58.3%)	>0.05
	XPTB	54 (41.2%)	5 (41.7%)	
HIV Status	Positive	1 (0.8%)	0 (0.0%)	>0.05
	Negative	126 (96.2%)	12 (100.0%)	
	Not tested or refused	3 (2.3%)	0 (0.0%)	
	Unknown	1 (0.8%)	0 (0.0%)	
HS lag time	Median (IQR)	68 (16-157)	106.5 (21.5-767.3)	>0.05
HS Delay	Yes	67 (51.1%)	8 (66.7%)	>0.05
	No	64 (48.9%)	4 (33.3%)	

Although not statistically significant, country cases had a longer health system delay with a median of 107 days from first presentation to start of treatment compared with a median delay of 68 days for metropolitan patients. Similarly, the apparent difference between country and metropolitan TB notifications in clinically important delay, as determined by the delay matrix, does not reach statistical significance.

CLINICAL CHARACTERISTICS

In 2021, 59% (n=84) of the notified cases had pulmonary involvement with 49% of cases (n=70) having pulmonary disease only while extrapulmonary disease only was reported in 41% (n=59) of the cases.

Of the extrapulmonary sites reported, lymph node was the most common (33%), followed by TB of the gastrointestinal tract (17%) and ocular TB (12%). Table 3 gives the numbers of extra-pulmonary sites reported among TB cases in 2021 (more than one extra-pulmonary site may be reported for each notified case).

Of the 143 cases notified in 2021, 98% (n=140) were new diagnoses of TB; while 2% (n=3) were classified as a TB recurrence; following treatment in Australia in one case and treatment overseas in the other two cases. TB recurrences may be due to either relapse or reinfection.

Figure 17: Tuberculosis notifications by site of disease, WA 2021

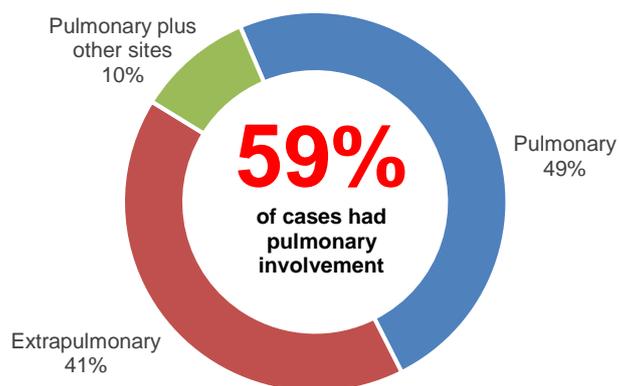
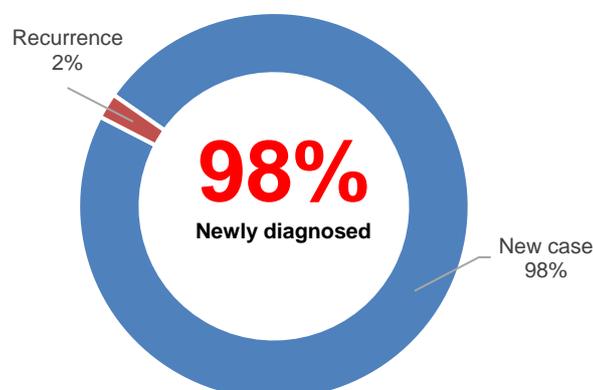


Table 3: Extra-pulmonary TB notifications by site of disease, WA 2021

Site of extra-pulmonary TB*	Number	% Total
Lymph Node	29	33%
Peritoneal (includes all GI sites)	15	17%
Ocular	11	12%
Pleural	9	10%
Cutaneous	7	8%
Disseminated TB	6	7%
Genitourinary	4	4%
Pericardial	3	3%
Adrenal	2	2%
Meningeal	1	1%
Laryngeal	1	1%
Bone-Joint	1	1%
Total	89	100%

* More than one extra-pulmonary site may be reported for each notified case of TB

Figure 18: Tuberculosis case classification, WA 2021



Most cases notified in 2021 (77%, n=110), were diagnosed with TB as part of an investigation of clinical symptoms. An additional 15 cases (10%) were identified through immigration health check, 11 cases (8%) were identified as a result of tests performed for reasons other than suspected TB disease, and seven cases (5%) were identified through contact investigation.

MYCOBACTERIAL LABORATORY DATA

The percentage of culture confirmed TB cases decreased slightly from 77% (n=106) in 2020 to 73% (n=104) in 2021. This was mainly due to decrease in culture positive extra-pulmonary TB with 32 (54%) culture confirmed cases in 2021 compared with 62% culture confirmation in 2020. On the other hand, culture confirmation of pulmonary TB cases increased, with 90% culture positive cases (88% in 2020). A further five cases were confirmed with positive Nucleic Acid Amplification Test (NAAT), (three pulmonary and two extra-pulmonary). Of the 104 cultured mycobacterial isolates, 102 (98%) were identified by Whole Genome Sequencing (WGS) as *Mycobacterium tuberculosis*, one as *Mycobacterium bovis* and one as *Mycobacterium orygis*.

Figure 19: Tuberculosis case by detection method, WA 2021

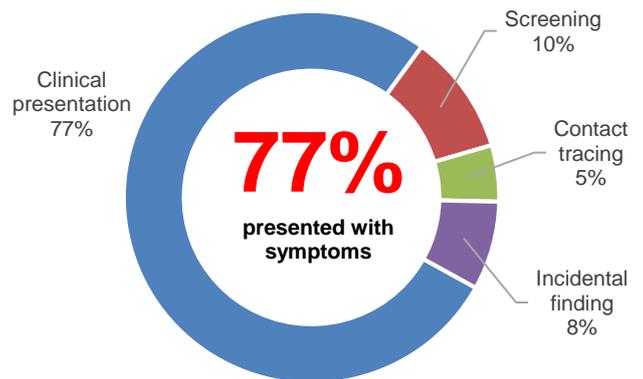


Figure 20: Tuberculosis Notifications by method of diagnosis, WA 2021

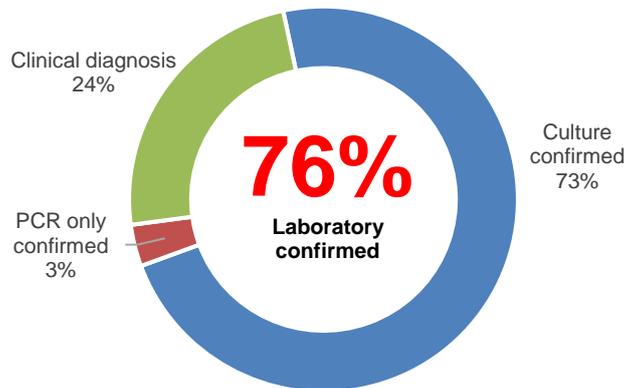


Table 4: Tuberculosis Notifications by culture and sputum smear result, WA 2021

Site	Culture Positive		Sputum Smear Positive	
	Number	% Site	Number	% Site*
All TB notifications	104	73%	48	34%
Pulmonary only	63	90%	45	64%
Pulmonary plus other sites	9	64%	3	21%
Extrapulmonary only	32	54%	0	0%

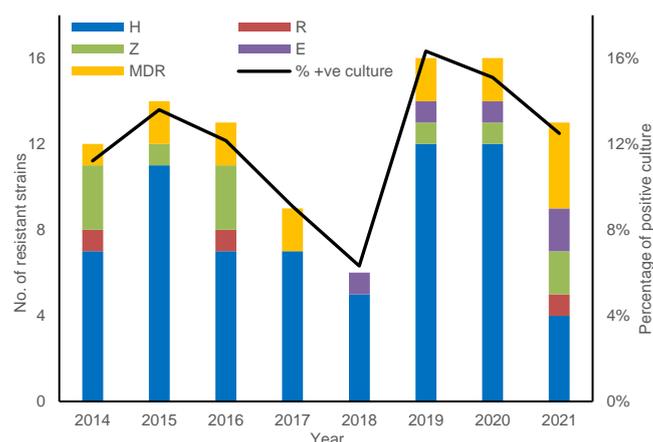
*Percentage of all cases including culture negative

The proportion of culture positive pulmonary TB cases in 2021 that were sputum smear positive was 67% (48/72), representing 46% of total culture positive TB notifications. This is an increase from the 59% pulmonary TB smear positive cases notified in 2020.

Drug susceptibility

Of 104 culture confirmed cases in 2021, 87% (n=91) were fully susceptible to all first line TB drugs and 13% (n=13) were resistant to at least one drug. These figures were slightly less than the 15% resistance noticed in 2020. In contrast, the number of multi-drug resistant TB (MDR-TB) cases increased from two cases in 2020 to four cases in 2021. This was the highest number of MDR-TB cases in one year since a similar number of four cases were reported in 2013. All patients with drug resistant TB were born overseas and all had newly diagnosed disease with no history of prior TB treatment.

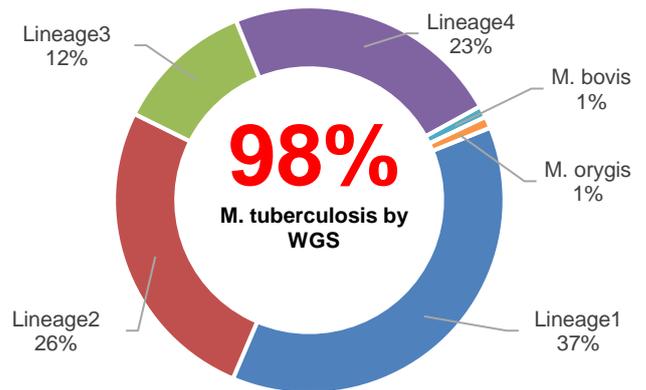
Figure 21: Tuberculosis cases with drug resistance, WA, 2014-2021



Genotyping and strain identification

From 2020, The TB reference laboratory started to use Whole Genome Sequencing (WGS) to characterise TB strains and assess transmission. Isolates that are within 10 single nucleotide polymorphisms (SNP) of another isolate are notified to the WATBCP for review and investigation of epidemiological links.

Figure 22: WGS tuberculosis strains, WA 2021



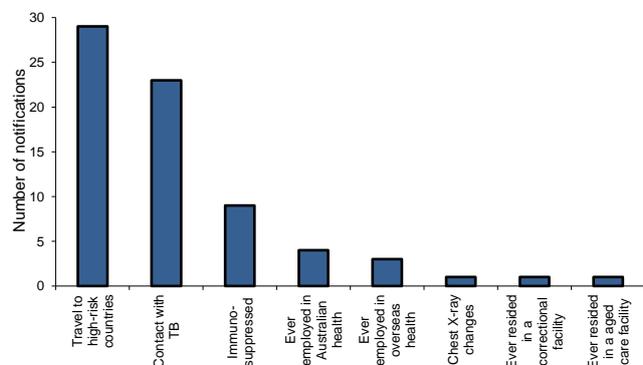
In 2021, Indo-Oceanic (lineage 1) were the most common strains representing 38% of the isolates, followed by East-Asian (lineage 2) 26%, Euro-American (lineage 4) 24% and East African-Indian (lineage 3) 12%.

Of the sequenced isolates, 7% (n=7) were found to be part of a cluster of at least 2 cases notified in 2021 or earlier. The remaining 97 culture positive cases (93%) were not linked to any other case at the time of analysis. Of the seven clustered cases, five (71%) were females, the median age was 30 years (range 24-32 years) and 86% (n=6) lived in Perth metropolitan area. Cases with pulmonary involvement accounted for 71% (n=5), of which 60% (n=3) had positive smear for Acid Fast Bacilli (AFBs) on a respiratory specimen. One of the seven clustered patients was Australian Aboriginal while the remaining six were overseas born (three from India and three from Bhutan). Epidemiological links were identified for two clusters involving household and extended family settings.

TUBERCULOSIS RISK FACTORS

Forty percent (n=57) of 2021 TB cases had no identified risk factors. Of the identified risk factors, the most reported was past travel to, or residence in, a high-prevalence country (41%). Being a household or close contact of TB (32%) and being immunosuppressed due to health condition or medication (13%) were the next highest reported risk factors.

Figure 23: Risk factors reported for tuberculosis notifications, WA 2021



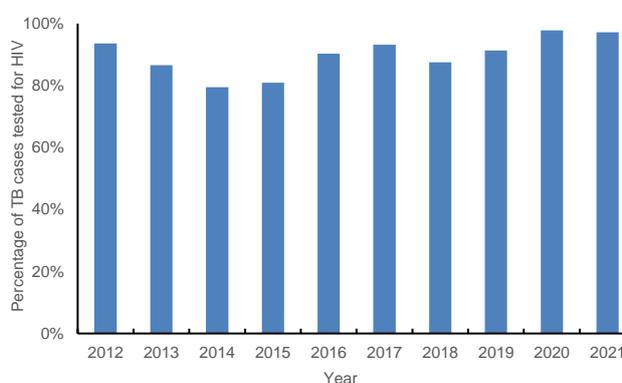
Risk factors were different between Australian born and overseas born cases. In Australian born cases, the most frequently reported risk factor was having a household member or close contact with TB (64%) followed by being immunosuppressed (27%). For overseas born cases, the most reported risk factor was past travel to, or residence in, a high prevalence country (48%).

Table 5: Risk factors for tuberculosis by place of birth, WA 2021

Risk Factor	All cases	Australian born	Overseas born
Travel to a high prevalence country	29 (41%)	0	29 (48%)
Contact with TB	23 (32%)	7 (64%)	16 (27%)
Immuno-suppressed	9 (13%)	3 (27%)	6 (10%)
Ever employed in Australian health	4 (6%)	0	4 (7%)
Ever employed in overseas health	3 (4%)	0	3 (5%)
Chest X-ray changes	1 (1%)	0	1 (2%)
Ever resided in aged care facility	1 (1%)	1 (9%)	0
Ever resided in a correctional facility	1 (1%)	0	1 (2%)

The Human Immunodeficiency Virus (HIV) status was known in 97% (n=139) of TB cases in 2021, which is stable compared with 2020 (98%) and is the highest rate of HIV testing since routine HIV screening of TB patients was implemented. One of the tested cases was HIV positive; an overseas born male with previously diagnosed HIV.

Figure 24: HIV screening at time of TB diagnosis, WA 2012-2021



TUBERCULOSIS AMONG HEALTH CARE WORKERS

In 2021, of those with known occupation (n=104), 13% (n=13) reported working as health care workers. Seven of these patients, representing 5% of 2021 total cases, had pulmonary TB with five considered potentially infectious due to sputum smear positive disease. Contact investigation of these smear positive health care workers revealed 55 contacts, from which no cases of active TB were identified, and 12 contacts were diagnosed with latent TB infection (LTBI). All 13 health care workers were overseas born from high TB prevalence countries.

HEALTH SYSTEM DELAY

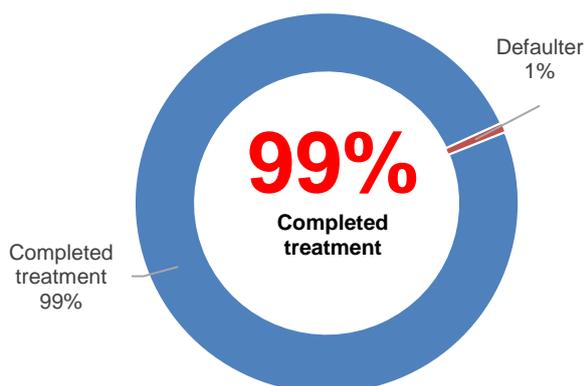
Of the 143 cases notified in 2021, 35% (n=50) started treatment within 30 days of first health contact, 24% (n=34) started treatment between 30 and 90 days and 41% (n=59) started treatment more than 90 days after their initial health contact. The median time from the first health contact to the start of treatment was 69 days (range 17-165 days) compared to 62 days and 45 days in 2020 and 2019 respectively. This apparent increase in delay was not statistically significant. Delay by TB type showed that pulmonary TB cases had a median delay of 44.5 days (range 13-132 days) (50 days in 2020) while extra-pulmonary cases had significantly longer delay (P < 0.05) with a median delay of 102 days (range=27-216 days) (89 days in 2020).

Clinically important delay, as assessed by the delay matrix introduced in 2016, identified delayed treatment in 52.4% of 2021 cases (n=75); similar to 2020 (52.2%). The matrix showed pulmonary TB cases to be more likely to be categorised as having clinically important delay than extra-pulmonary TB (57.1% vs 45.8%), with an odds ratio of 1.58 (95% CI= 0.8-3.1). Similar figures were reported in 2020 (58.8% vs 43.1%).

TREATMENT OUTCOMES, 2020

Treatment outcome was assessable for 97% (n=134) of the 138 cases that started TB treatment in 2020 after excluding those transferred outside of Australia (three cases) or died of other causes while on treatment (one case). There were no cases still on treatment.

Figure 25: Assessable tuberculosis treatment outcome, WA, 2020



The proportion of cases successfully treated (including cured and completing treatment) was 99% (n=133) of assessable cases, increasing from the 96% reported in 2019.

Table 6: Tuberculosis treatment outcome, WA, 2020

Outcome	Number	% Total
Assessable outcomes		
Treatment success	133	99%
Cured (bacteriologically confirmed)	0	0%
Completed treatment	133	99%
Interrupted treatment	0	0%
Died of TB (died during treatment of TB, as a result of TB disease)	0	0%
Defaulter	1	1%
Failure	0	0%
Not followed up, outcome unknown	0	0%
Total assessable	134	100%
Non-assessable outcomes		
Transferred out of Australia	3	2%
Died of other cause (died during treatment of cause other than TB)	1	1%
Still under treatment	0	0%
Total	138	100%

There were no TB related deaths reported in 2020 but one case defaulted before completing adequate treatment.

LATENT TUBERCULOSIS INFECTION

In 2021, the number of people treated for latent tuberculosis infection (LTBI) remained stable with 437 individuals starting treatment compared to 438 in 2020. Treatment completion rate was 90% (n=392), slightly less than the 91% (n=398) observed in 2020.

Gender distribution among those starting LTBI treatment showed female predominance representing 57.9% (n=253) and female to male ratio of 1.4:1 (1.2:1 in 2020). The majority were less than 44 years of age (71.9%), with the age group 35-44 representing the biggest age group and accounting for 27.0% of those starting LTBI treatment.

Where place of birth was recorded, 87.9% of those starting LTBI treatment were among overseas born individuals and 83.5% were born in high TB prevalence countries (countries with annual TB rate of $\geq 40/100,000$ population).

Of those that took LTBI treatment, the reason for the LTBI test was health care worker screening (41%), contact tracing (33.6%), screening because of recent migration (9.8%), screening prior to immunosuppressive treatment (5.7%) or screening of newly arrived refugees (4.1%).

Figure 26: LTBI treatment outcomes, WA 2018 - 2021

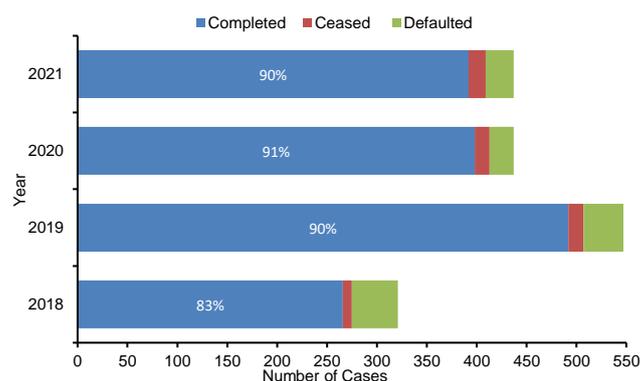


Figure 27: LTBI treatment by age group and sex, WA 2021

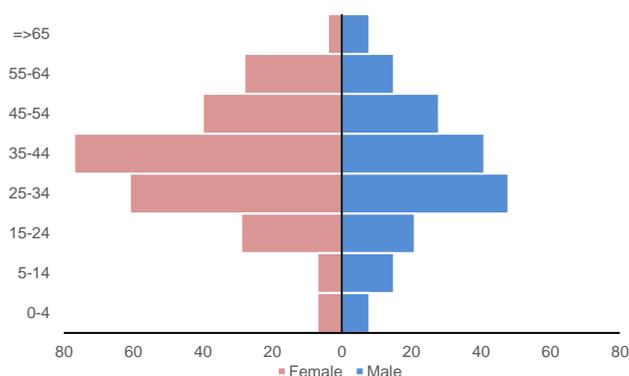


Figure 28: LTBI cases by place of birth, WA 2021

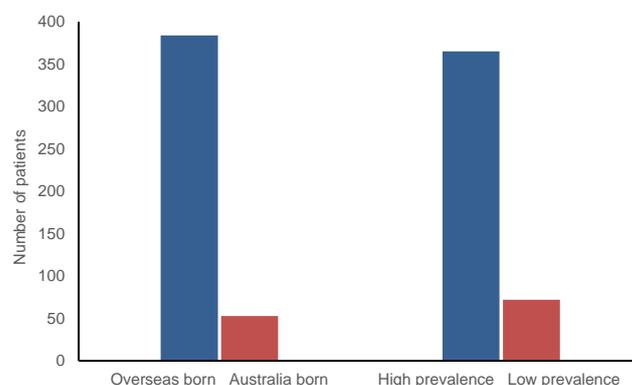


Table 7: Reason for LTBI test in cases treated, WA 2021

Country of Birth	Number	% Total
Healthcare worker screening	179	41.0%
TB Contacts	147	33.6%
Recent migrant	43	9.8%
Immunosuppressed	25	5.7%
Recently arrived refugee	18	4.1%
Other	25	5.7%

Of those failing to satisfactorily complete LTBI treatment in 2021, 3.9% (n=17) ceased medication due to adverse drug reactions, and 6.4% (n=28) failed to complete LTBI treatment for reasons that included non-adherence or non-attendance to clinic appointments, which can potentially be improved with additional targeted interventions.

TUBERCULOSIS CONTACT INVESTIGATION

In 2021, a total of 2189 contacts from 133 notified TB cases (93% of all notifications) were identified. Of these, 93.7% (n=2052) were contacts of 77 pulmonary TB cases and 6.3% (n=137) were contacts of 56 extra-pulmonary TB cases. No contacts were identified for seven smear negative pulmonary TB cases and three extra-pulmonary TB cases.

The highest number of contacts associated with a single case was 234 contacts. This was reported in two separate occasions each involving smear positive pulmonary TB cases with contact investigation in health care and congregate settings. The median number of contacts per case was three (interquartile range (IQR) 2-7 cases).

The median number of contacts of pulmonary TB cases was five contacts per case (IQR 2.5-19.5 contacts). The majority of pulmonary TB cases (64.9% n=50) had 10 or fewer contacts, 16 cases (20.8%) had 11 to 50 contacts while 11 cases (14.3%) had more than 50 contacts identified. There were 21 children less than five years of age identified as contacts, representing 1.0% of pulmonary TB contacts.

Figure 29: LTBI by treatment outcome, WA 2021

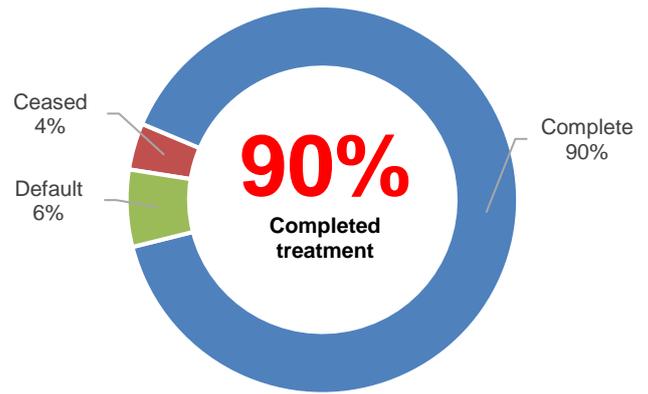


Figure 30: Number of TB contacts, WA 2021

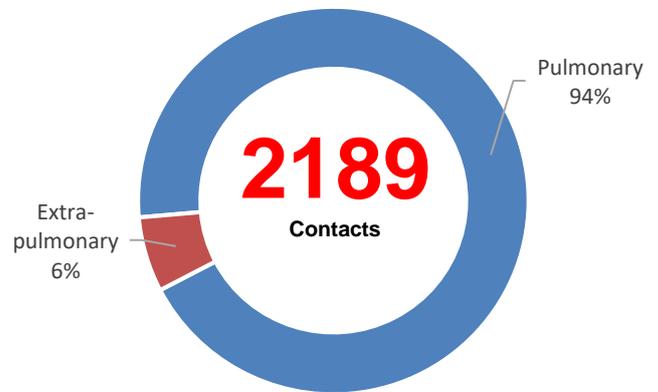
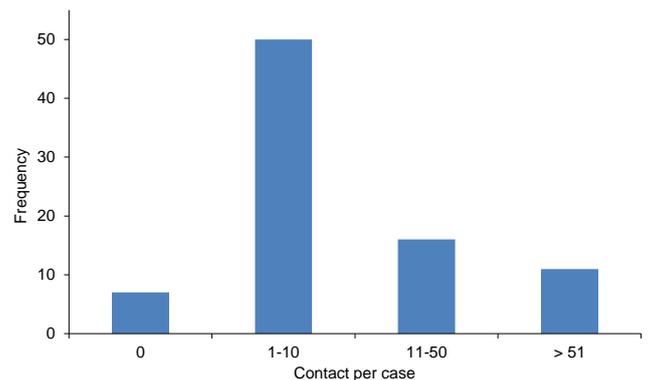


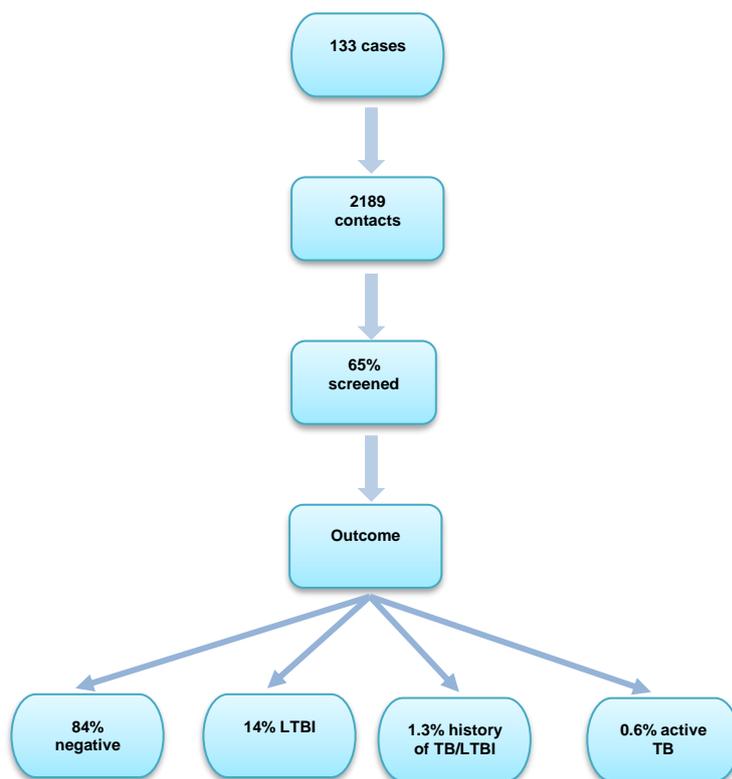
Figure 31: Number of contacts per respiratory case, WA 2021



Contact investigation outcomes

In 2021, 32.1% of all contacts (n=608) did not attend for contact tracing tests, did not complete testing or there was no recorded outcome of their TB screening; this was an increase from the 25.5% contacts with no outcome recorded in 2020. A further 23 contacts (1.2%) died before screening completion and 21 contacts (1.1%) were transferred out of WA to their jurisdiction of residence. Contact tracing assessment was completed by 65%, of which 83.7% (n=1032) had negative screening results, 14.4% (n=178) were diagnosed with LTBI, 1.3% (n=16) had a past history of TB or LTBI and 0.6% (n=7) were found to have secondary active TB identified by contact investigation. Five of the secondary TB cases were children less than five years of age who were household contacts of a family member with smear positive pulmonary TB.

Figure 32: Contact investigation outcome, WA 2021



DATA QUALITY AND COMPLETENESS

Notification data

TB notification data is collected through core notification data, similar to all other notifiable infectious diseases, and an enhanced TB database that collects disease specific information not captured by the core notification data. A completion audit of primary notification data fields is presented. Fields that had their records extracted from other database fields were excluded.

Core notification data

All audited variables were complete with no missing values. Data cleaning undertaking as part of this report preparation continues to contribute to this data quality improvement.

Enhanced TB surveillance data

All audited enhanced surveillance variables were complete except for 'residence time in Australia' and 'Australia arrival date'. As noted in previous reports these were not actual missing values but were not recorded for Australian born cases and is primarily a reflection of the database design limitation that continues to identify Australian born cases in these variables with empty fields.

Latent TB and contact investigation data

The quality of LTBI data improved in 2021 with 'Risk Factor' and 'year of Australia entry' having the most missing values.

Also, contact investigation data improved in 2021 but data gaps and incomplete records were still prevalent. Importantly, 16% of the identified contacts had no screening outcome recorded.

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