Tuberculosis in Wales Annual Report

Data to the end of 2024

Public Health Wales

Public Health Wales exists to protect and improve health and wellbeing and reduce health inequalities for people in Wales. We work locally, nationally and internationally, with our partners and communities.

Communicable Disease Surveillance Centre
Public Health Wales
Number 2 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ
www.publichealthwales.org

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1 Executive summary

1.1 Purpose

This report provides an epidemiological overview of tuberculosis (TB) in Wales. It includes data on newly diagnosed TB cases reported through the National Tuberculosis Surveillance System (NTBS). The report also includes Whole Genome Sequencing (WGS) data provided by the UK Health Security Agency (UKHSA), and supplemented using NTBS, to describe clusters of TB disease within Wales. The report is aimed at health professionals, policy makers, criminal justice, third sector agencies and academia.

1.2 Key findings and trends

- The number of newly diagnosed TB cases in Wales increased from 84 in 2023 to 95 in 2024, representing an increase in annual incidence from 2.7 to 3.0 per 100,000 population. Despite this increase, there is an overall decreasing trend in TB incidence in Wales since a peak of 3.7 per 100,000 population in 2014. Whilst overall Wales remains within the WHO definition of a low incidence country (<10 per 100,000 population per year) there is substantial geographic variation in incidence.
- Cardiff and Vale University Health board (UHB) continues to have the highest rates of TB (5.0 per 100,000 population) in Wales. However, the rate in Aneurin Bevan UHB has decreased from 4.4 per 100,000 population in 2023 to 2.0 per 100,000 population in 2024.
- In 2024, rates of TB remained highest amongst males with 4.5 per 100,000 population compared to 1.6 per 100,000 population in females, consistent with previous years with the exception of 2022.
- Whilst TB incidence rates remain the highest in those aged 35-44 (5.9 per 100,000), there was a substantial increase in the rate of those aged 15-24 (0.8 to 5.4 per 100,000), the highest it has been in over ten years.
- The majority of cases born outside of the UK are within the 25-54 year age group (66%), whereas half (50%) of those born in the UK were aged 55 or over.
- 71% newly diagnosed TB cases in Wales in 2024 were in people born outside the UK. Of these cases, 31% had an interval period of over 11 years between arrival in the UK and notification to NTBS (median 4 years, IQR 2-14 years). It cannot be established whether the percentage of these cases are the result of reactivation of TB infection acquired prior to arrival, new acquisition overseas after initial arrival, or transmission within the UK subsequent to arrival.
- The five-year average rate of TB remains highest in people of Pakistani or Black-African ethnicity (78.5 per 100,000 and 69.4 per 100,000 population respectively).
- Overall, 14% of TB cases in 2024 self-reported having at least one social risk factor, with homelessness and alcohol misuse being the most prevalent risk factors (7% and 6% respectively). 4% self-reported having two or more risk factors, a 6% decrease compared to 2023.
- Social risk factors were more frequently reported in UK-born cases with 25% of those reported having at least one social risk factor compared to 9% in non-UK born cases.

- TB disease is more frequently reported in those living in the more deprived areas of Wales. The five-year average rate of TB in the most deprived decile increased from 6.9 to 7.6 per 100,000 population whilst the rate in the least deprived decile decreased from 1.6 to 1.0 per 100,000 population.
- In 2024, 82% of all cases were culture confirmed. The majority (63%) of TB cases in 2024 had a pulmonary site of infection, with 83% of these cases having culture confirmation. This remains above the European Centre of Disease Prevention and Control (ECDC) target of 80% for culture confirmation of pulmonary tuberculosis.
- Of pulmonary (with or without extra pulmonary disease) cases with a sputum smear sample, 48% were sputum smear positive indicating high potential risk of onward infection.
- Of the 73 TB cases exhibiting symptoms in 2024, 45% had started treatment within two months of symptom onset. 14% of pulmonary cases started treatment over four months after symptom onset, a decrease of 10% compared to 2023.
- Trends in drug resistant TB in Wales remain low with those identified with `any resistance to one or more first line drugs` at 1% in 2024.

2 Data sources, limitations and methodology

2.1 National TB Surveillance system

The National TB Surveillance System (NTBS) is a surveillance system run by UK Health Security Agency (UKHSA) that provides detailed information on the epidemiology of tuberculosis in England, Wales and Northern Ireland. Clinical teams notify newly diagnosed cases and update information on treatment outcomes. All people diagnosed with TB in Wales are reported through NTBS. Data extraction and cleaning is carried out by UKHSA to ensure deduplication across England and Wales prior to release to Public Health Wales for publication.

2.2 Welsh Index of Multiple Deprivation

The Welsh Index of Multiple Deprivation (WIMD)[1]is the official measure of relative deprivation for small areas in Wales. It is a National Statistic produced by Welsh Government. WIMD identifies areas with the highest concentrations of several different types of deprivation. The prime purpose of the index is to provide the evidence to inform planning and policy including funding or targeting of programmes and services for local areas. WIMD ranks all Lower Super Output Areas in Wales from 1 (most deprived) to 1,909 (least deprived).

WIMD is currently made up of eight separate domains (or types) of deprivation. Each domain is compiled from a range of different indicators. The domains included in WIMD 2019 are:

- Income
- Employment
- Health
- Education
- Access to Services
- Housing
- Community Safety
- Physical Environment

WIMD is a measure of multiple deprivation that is both an area-based measure and a measure of relative deprivation.

2.3 UKHSA whole genome sequencing and cluster analysis

Whole genome sequencing (WGS) on culture confirmed samples of TB in Wales is carried out by the Pathogen Genomics Unit (PenGU). Information on WGS-linked clusters of TB containing two or more Welsh cases is generated by UKHSA using WGS results. There is 12 single nucleotide polymorphism (SNP) distance cut-off for clustering isolates. Public Health Wales links patient information from NTBS with the sequence data from isolates.

2.4 Office for National Statistics

The Office for National Statistics (ONS) provides national and subnational mid-year population estimates for the UK and its constituent countries by administrative area, age and sex (including components of population change, median age and population

[1] Further information on the Welsh Index of Multiple Deprivation available at: https://www.gov.wales/welsh-index-multiple-deprivation

density). Population statistics for gender, age and location of residence are based on 2024 mid-year figures[2]. Population estimates for ethnic groups in Wales are based on the 2021 ONS census[3].

2.5 Wales national TB cohort review

The National Cohort Review Programme has been running since 2012 involving the Welsh Respiratory Delivery Group and Public Health Wales. The cohort review provides enhanced data on all cases derived from the NTBS (previously the Enhanced Surveillance System (ETS)) and meets quarterly. The Cohort Reviews have representation from medical and nursing staff in all health boards as well as the Health Protection Team and Communicable Disease Surveillance Centre (CDSC) from Public Health Wales. Within this report enhanced case data relating to co-morbidities have been used.

[2] Office for National Statistics. Mid-2023 population estimates: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/estimatesofthepopulationforenglandandwales

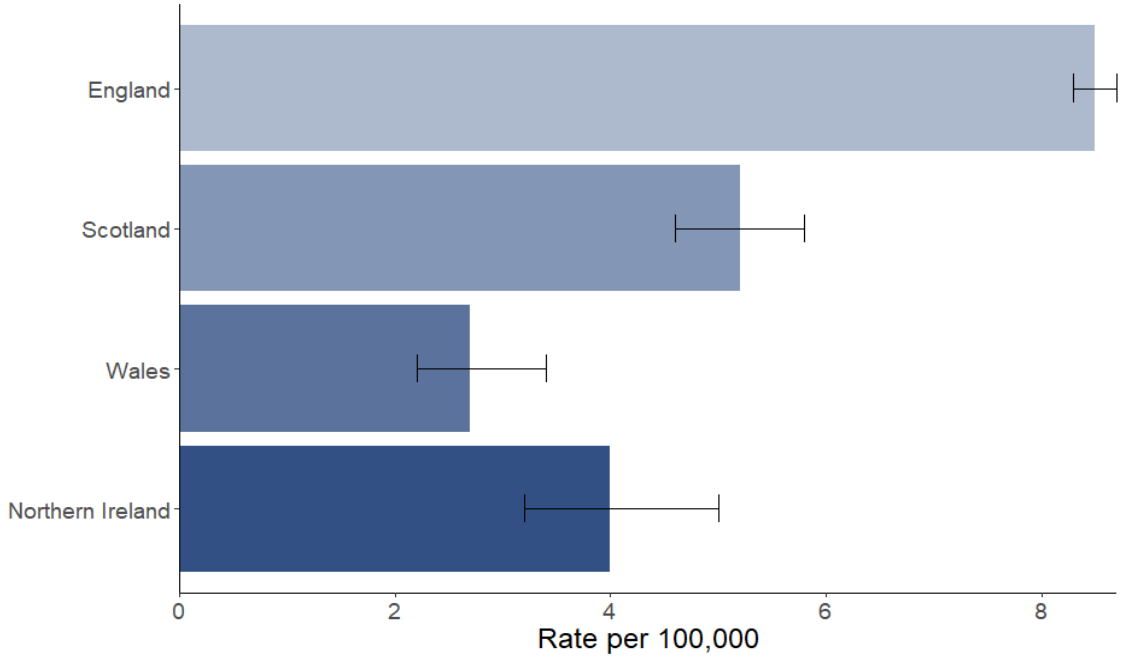
[3] Office for National Statistics. 2021 census : https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/datasets/ethnicgroupbyageandsexinenglandandwales

3 Tuberculosis (TB) notifications and incidence

In 2024, a total of 95 newly diagnosed cases of TB were reported in Wales. This represents an increase of 14.5% from the previous year (83 cases, 2.7 per 100,000 population).

The rate of TB in Wales remains the lowest in the UK with a rate of 2.7 per 100,000 in 2023 compared to the UK rate of 7.8 per 100,000 population. Four nations data are not yet available for 2024.

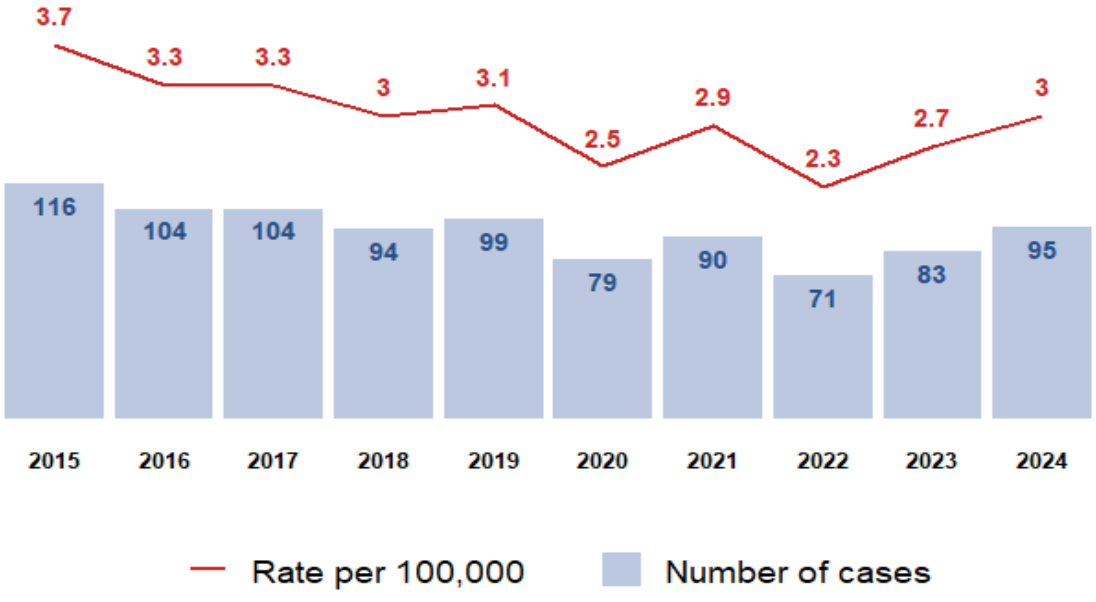
Figure 1 Rates of Tuberculosis per 100,000 population in the UK, 2023



Source: UKHSA, 2023

Notifications and rates of TB in Wales have decreased by 18% over the past ten years from 2015 to 2024 (Figure 2).

Figure 2 Number of cases and rate of TB per 100,000 population (red line) in Wales, 2015-2024



Source: NTBS, 2024

3.1 Demographic profile of TB cases

3.1.1. Geographical distribution

In 2024, the highest number of new TB cases reported were resident in the Cardiff and Vale UHB and Swansea Bay UHB areas (28 and 15 cases respectively), representing a rate of 5.5 and 3.8 per 100,000 population respectively. The lowest rate was reported in Powys THB at 0.7 per 100,000 population. Rates per 100,000 population by health board of residence are shown in Table 1.

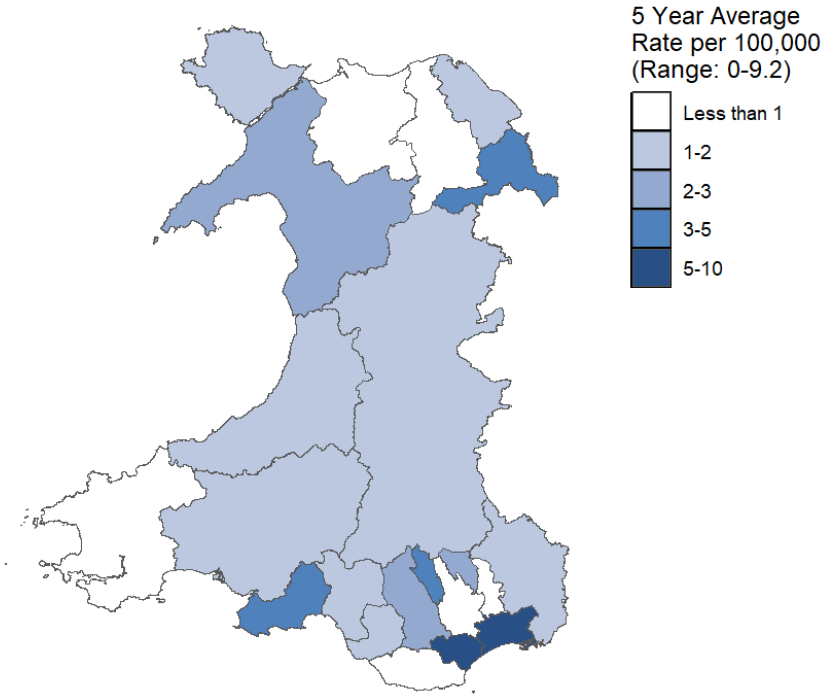
Table 1 TB notifications per 100,000 population by health board of residence from 2020-2024

Local Health Board	2020	2021	2022	2023	2024
Aneurin Bevan UHB	3.0	3.2	3.2	4.4	2.0
Betsi Cadwaladr UHB	1.6	2.5	1.5	0.7	2.0
Cardiff and Vale UHB	5.0	4.7	3.8	4.2	5.5
Cwm Taf Morgannwg UHB	1.8	2.7	2.3	0.2	2.3
Hywel Dda UHB	0.5	1.8	0.5	1.6	2.6
Powys THB	3.0	0.7	0.0	3.0	0.7
Swansea Bay UHB	2.3	2.4	2.3	3.7	3.9

Source: NTBS, 2024

Within health board area there is substantial variation in case rates by local authority of residence, as show in Figure 3, with Newport and Cardiff reporting the highest rates year on year, with 5-year average rates (2020-2024) of 9.2 and 6.2 per 100,000 population respectively.

Figure 3 Five-year average rate of TB per 100,000 population by Local Authority of Residence, 2020-2024



Source: NTBS, 2024

3.1.2 Sex and age distribution

Of the 95 cases reported in 2024, 73% were male and 27 % were female (rates of 4.5 and 1.6 per 100,000 population respectively), a consistent trend overtime with the exception of 2022, where the majority of cases were female (Table 2).

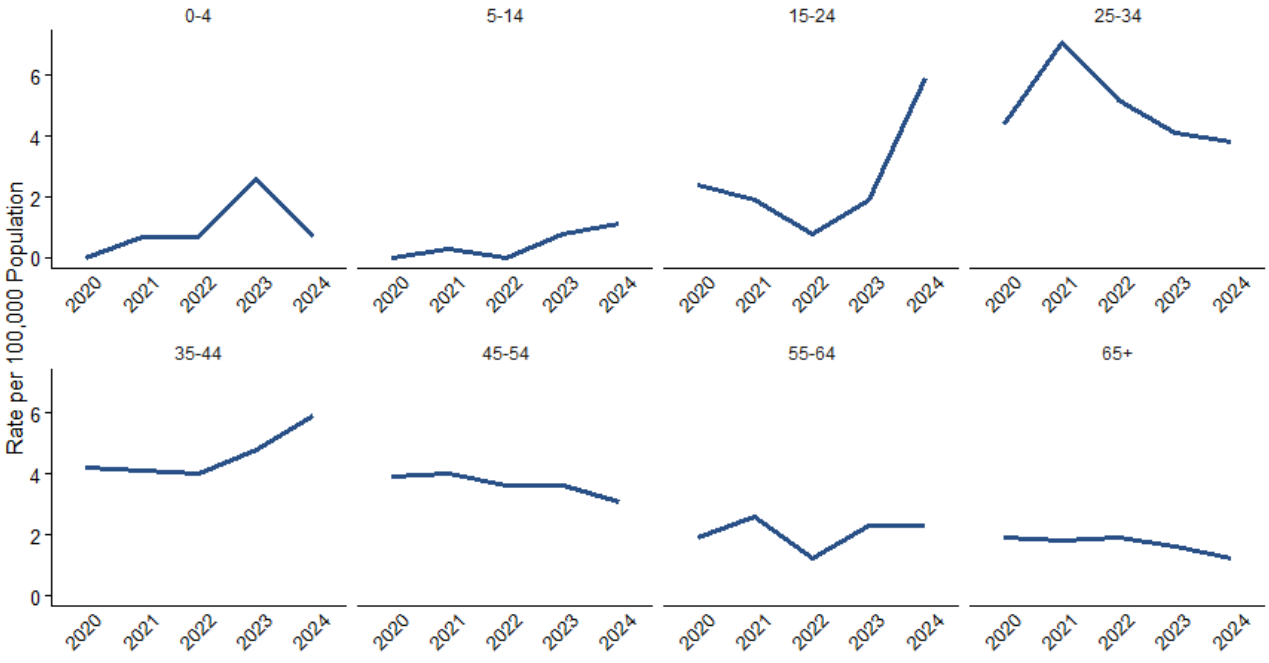
Table 2 Number of notifications and rate of TB in Wales by sex, 2020-2024

Sex	2020	2021	2022	2023	2024
Female	1.7 (28)	2.3 (36)	2.3 (37)	2.4 (39)	1.6 (26)
Male	3.3 (51)	3.6 (54)	2.2 (34)	2.9 (44)	4.5 (69)
Total	79	90	71	83	95

Source: NTBS, 2024

Whilst TB incidence rates remain the highest in those aged 35-44 (5.9 per 100,000), there was a significant increase in the rate of those aged 15-24 (0.8 to 5.4 per 100,000), the highest it has been in over ten years. The rate in the 0-4 year group decreased from 2.6 to 0.7 per 100,000 population as shown in Figure 4.

Figure 4 Rate of TB per 100,000 population by age group and year, 2020-2024



Source: NTBS, 2024

3.1.3 Country of birth and ethnicity

Country of birth

The majority (71%) of TB cases reported in Wales in 2024 were born overseas (Table 3) with 29% of cases born in UK. The proportion of those born overseas has increased by 12% compared to 2023.

Table 3 Number and proportion (%) of TB cases UK and non-UK born by year, 2020-2024

Place of Birth	2020	2021	2022	2023	2024
Born Abroad	47 (59%)	58 (64%)	55 (77%)	49 (59%)	67 (71%)
Born in UK	30 (38%)	32 (36%)	16 (23%)	34 (41%)	28 (29%)
Not Known	2 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	79	90	71	83	95

Source: NTBS, 2024

Of the 67 born outside of the UK and notified in 2024, the most frequent countries of birth of cases were India (19%) and Bangladesh (13%).

Table 4 Demographics of TB cases UK and non-UK born by year, 2020-2024

		2020		2021		2022		2023		2024	
		Non-UK born	UK born	Non-UK born	UK born	Non-UK born	UK born	Non-UK born	UK born	Non-UK born	UK born
Sex	Female	18	9	24	12	29	8	27	12	18	8
	Male	29	21	34	20	26	8	22	22	49	20
Age Group	0-24	≤5	≤5	≤5	≤5	≤5	≤5	8	6	19	8
	25-54	36	13	42	16	44	≤5	34	14	44	6
	55+	6	14	11	12	10	8	7	14	≤5	14

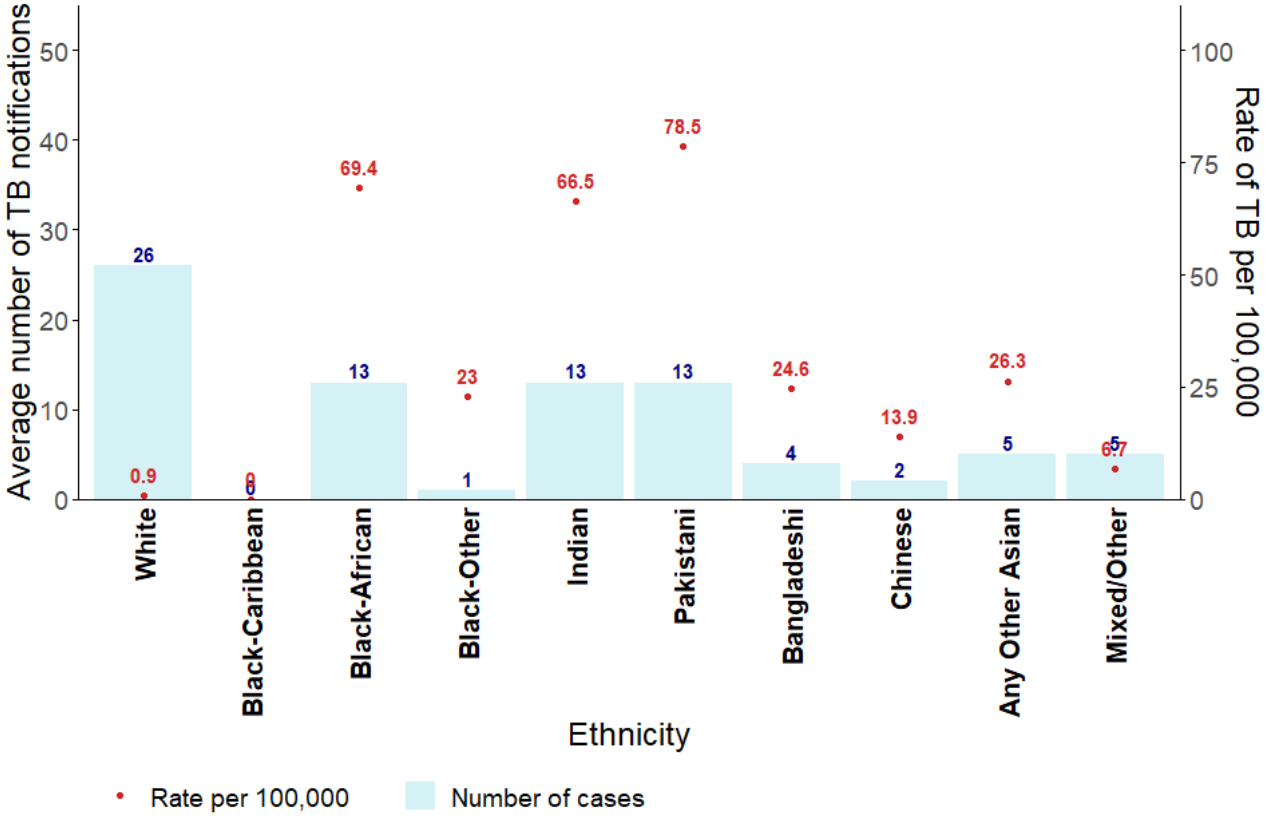
There were over double the number of non-UK born male cases (n=49) compared to UK born (n=20) in 2024, and the majority of cases born outside of the UK were between the ages of 25 and 54 (Table 4).

Ethnicity

In 2024, 25% of TB cases were reported in the White ethnic group with the remaining 75% reported within other ethnic groups, an increase of 10% from 2023. The highest rates have been recorded in the Black-African, Indian and Pakistani populations[4] (Figure 5).

[4] Rates per 100,000 population by ethnicity derived using ONS census data 2021 https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/datasets/ethnicgroupbyageandsexinenglandandwales

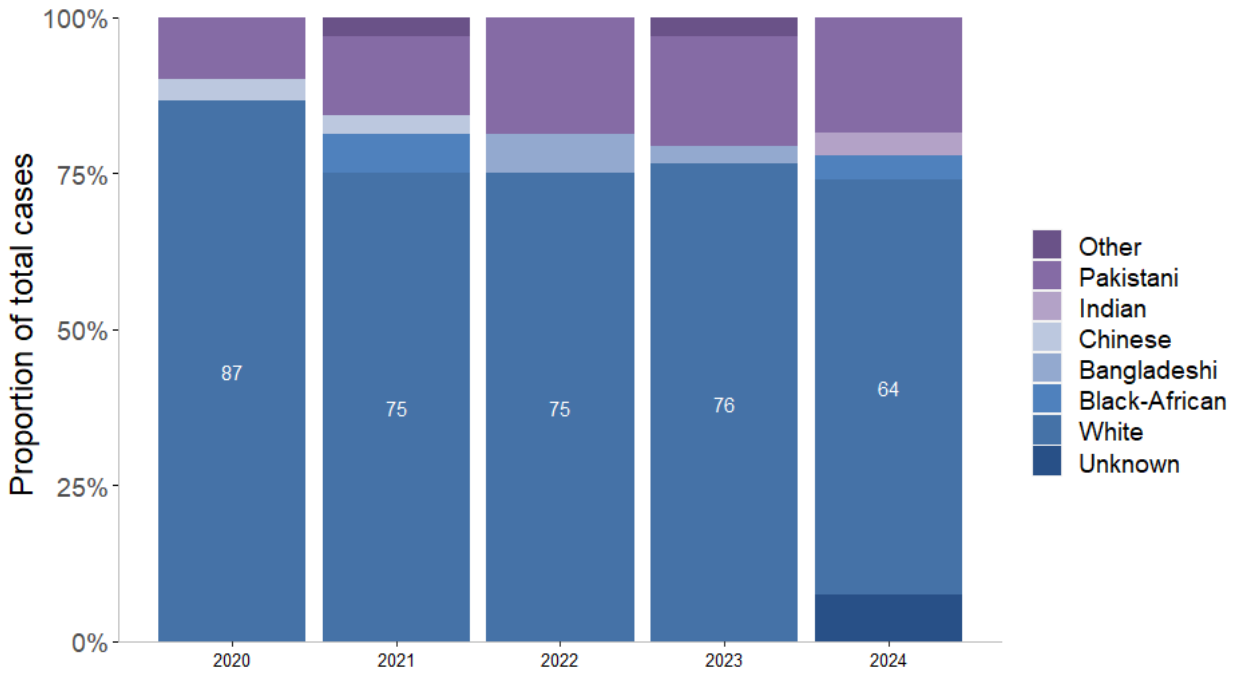
Figure 5 Five-year average annual number of TB cases and rate per 100,000 population by ethnic group, 2020-2024, Wales



Source: ONS Census, 2021

In 2024, 64% of UK born cases and 9% of non-UK born cases were of White ethnicity. The ethnic profile of UK born TB cases is shown in figure 6.

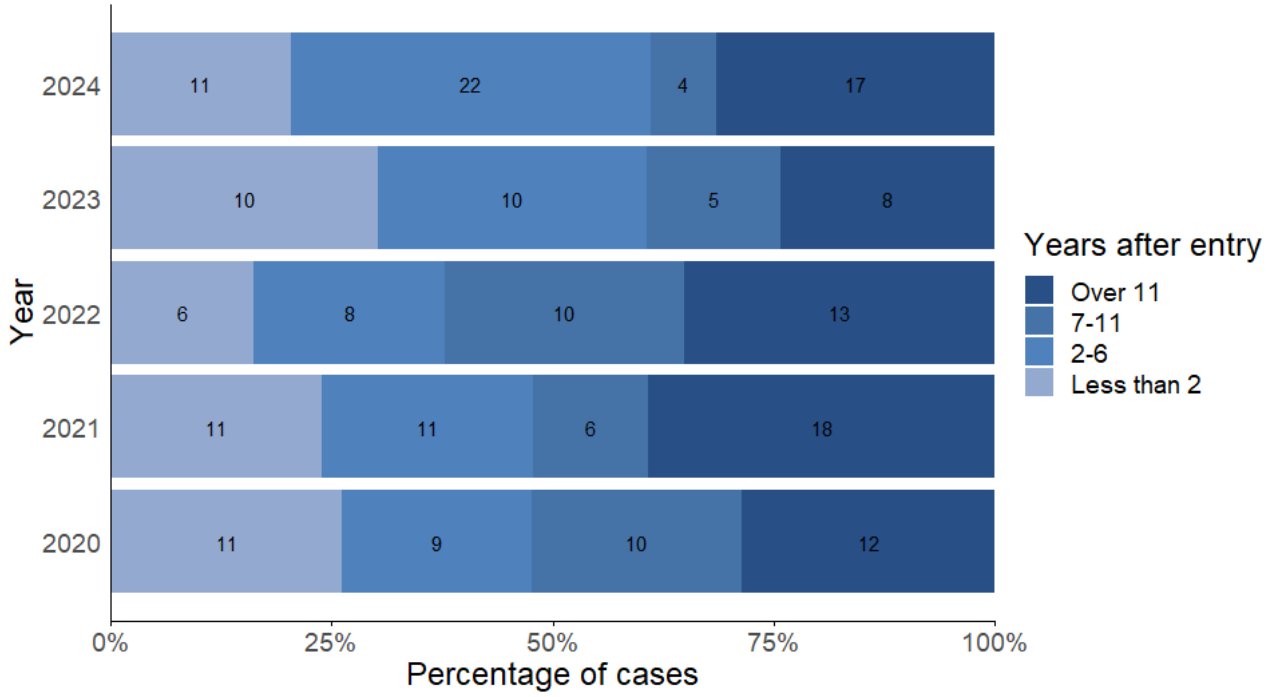
Figure 6 Proportion (%) of UK born TB cases by ethnicity in Wales, 2020-2024



Source: NTBS, 2024

Of the cases notified in 2024 with a date of arrival into the UK, 20% were diagnosed within 2 years of arrival. 31% were diagnosed with TB more than 11 years after arrival (Figure 7). It is not possible to establish what proportion of these cases were the result of reactivation of TB infection acquired prior to arrival, new acquisition overseas after initial arrival, or transmission within the UK subsequent to arrival.

Figure 7 Time between entry to UK and TB notification for non-UK born cases in Wales, 2020-2024



Source: NTBS, 2024

3.1.4 Social risk factors, deprivation and co-morbidities

Self-reported social risk factors

In 2024, overall, 14% of cases self-reported having at least one social risk factor, a slight increase compared to 2023 but still a reduction compared to the 2020-2021 period (Figure 8). The most common risk factor in the cohort was homelessness at 7%, closely followed by alcohol misuse (6%). Two or more risk factors, indicative of more complex risk, were reported by 4%, a 4% decrease from the previous year.

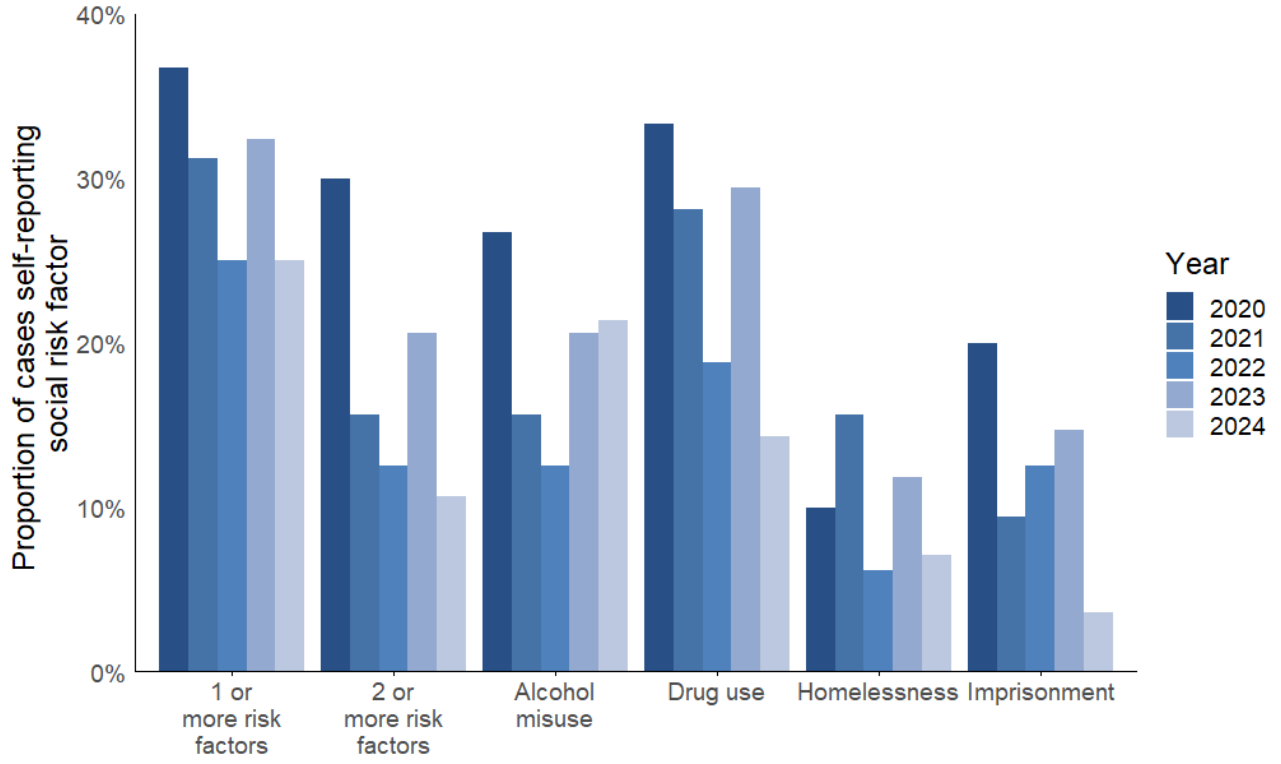
Figure 8 Self-reported history of current social risk factors among TB patients in Wales 2020-2024

Source: NTBS, 2024

However, rates of social risk factors vary substantially between UK and non-UK born patients as show in Figures 9 and 10.

In 2024, 25% of UK-born cases reported having at least 1 risk factor, and 11% had two or more. The factors with the greatest proportion were alcohol misuse (21%), drug use (14%) and homelessness (7%).

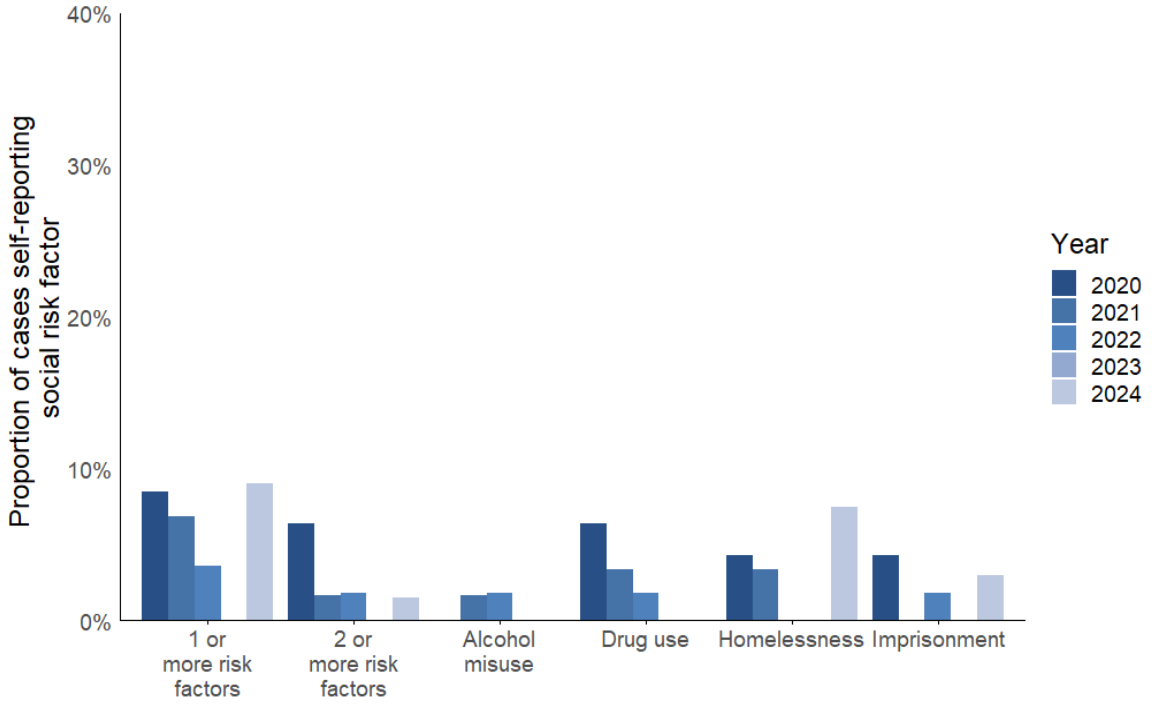
Figure 9 History of current self-reported social risk factors among UK-born TB patients in Wales, 2020-2024



Source: NTBS, 2024

Of the cases born outside of the UK reported in 2024, 9% reported at least one risk factor and 2% having two or more. Within this population, homelessness and imprisonment were the most frequently reported social risk factors (Figure 10).

Figure 10 History of current self-reported social risk factors among non-UK born TB patients in Wales, 2020-2024

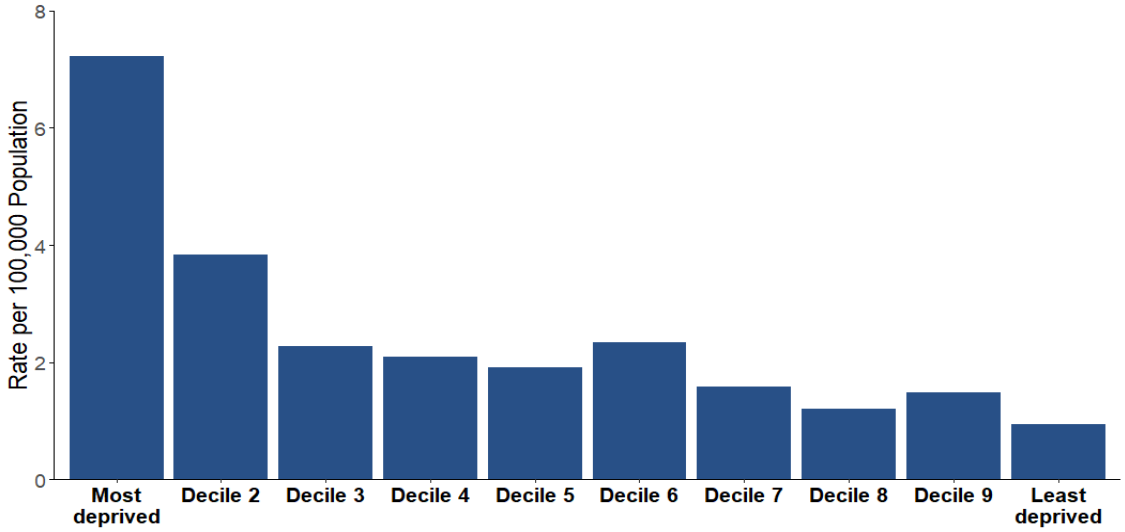


Source: NTBS, 2024

Deprivation

TB disease is more frequently reported in the most deprived communities in Wales (Figure 11). The rate of TB has been highest in the most deprived decile[5] for the past ten years. In 2024, the rate in the most deprived decile was 7.6 per 100,000 population and 1.0 per 100,000 population in the least deprived decile.

Figure 11 5-year average rate of TB in Wales per 100,000 population by deprivation decile, 2020-2024



Source: NTBS, 2024

[5] As measured using the Welsh Index of Multiple Deprivation (WIMD). Further information can be found at: https://statswales.gov.wales/Catalogue/Community-Safety-and-Social-Inclusion/Welsh-Index-of-Multiple-Deprivation

Co-morbidities

Where co-morbidity status was known for those notified in 2024, 10% of cases had diabetes (Table 5). The next most frequent co-morbidities within the five-year-period were immunosuppression (5%) Hepatitis C and chronic Liver Disease (4% each).

Table 5 Percentage of TB cases in Wales with co-morbidities, 2020-2024

Comorbidity	5-Year Average (% of total cases)
Diabetes	10%
Hepatitis B Virus	2%
Hepatitis C Virus	3%
Chronic Liver Disease	3%
Chronic Renal Disease	1%
Immunosuppression[1]	5%

[1] Immunosuppression includes those with certain diseases, chronic inflammatory conditions, those on biological therapy and transplant recipients

Source: NTBS, 2024

4 Diagnosis, microbiology and drug resistance

4.1 Diagnosis and site of infection

Pulmonary TB (with or without extra-pulmonary disease) accounted for 63% of cases in 2024 and of these, 22% also had extra pulmonary disease.

Table 6 Number and percentage of TB cases in Wales by site of disease, 2020,2024

Site of Disease*	2020	2021	2022	2023	2024
Pulmonary**	46 (58%)	56 (62%)	41 (58%)	47 (57%)	60 (63%)
Extra-thoracic lymph nodes	9 (11%)	10 (11%)	17 (24%)	23 (28%)	20 (21%)
Intra-thoracic lymph nodes	10 (13%)	10 (11%)	Less than 5	Less than 5	9 (9%)
Pleural	7 (9%)	8 (9%)	7 (10%)	Less than 5	6 (6%)
Gastrointestinal	Less than 5	Less than 5	Less than 5	7 (8%)	6 (6%)
CNS-meningitis	Less than 5	Less than 5	0 (0%)	0 (0%)	Less than 5
CNS-other	Less than 5	Less than 5	Less than 5	0 (0%)	0 (0%)
Bone-spine	Less than 5	6 (7%)	Less than 5	Less than 5	Less than 5
Bone-other	Less than 5	Less than 5	Less than 5	Less than 5	Less than 5
Genitourinary	Less than 5	Less than 5	Less than 5	Less than 5	Less than 5
Laryngeal	0 (0%)	Less than 5	0 (0%)	Less than 5	0 (0%)
Cryptic	0 (0%)	Less than 5	0 (0%)	0 (0%)	0 (0%)
Other extra pulmonary	26 (33%)	21 (23%)	12 (17%)	23 (28%)	33 (35%)
Total cases	**79**	**90**	**71**	**83**	**95**

*Patients may have disease at more than one site
**Pulmonary TB includes miliary TB in accordance with the WHO's recommendation and international reporting definitions[7]

Source: NTBS, 2024

In 2024, 82% of all cases were culture confirmed, and 83% of pulmonary cases (with or without extra pulmonary disease) were culture confirmed. This remains above the European Centre for Disease Prevention and Control (ECDC) target of 80% for culture confirmation of pulmonary tuberculosis[6].

Among 78 culture-confirmed cases:

- 92 % were due to *M. tuberculosis*
- 1 % were due to *M. bovis*
- The remaining 5% were not reported.

[6] European Centre for Disease Prevention and Control (ECDC).- https://www.ecdc.europa.eu/sites/default/files/media/en/publications/Publications/101111_SPR_Progressing_towards_TB_elimination.pdf

Table 7 Number and percentage of TB cases in Wales with bacteriological confirmation, 2020-2024

Bacteriological Results	2020	2021	2022	2023	2024
Culture confirmed[1]	66 (84%)	69 (77%)	53 (75%)	64 (77%)	78 (82%)
Culture confirmed pulmonary cases[2]	38 (90%)	52 (96%)	34 (85%)	40 (85%)	50 (83%)
Pulmonary cases with sputum[2]	29 (69%)	28 (52%)	28 (70%)	23 (49%)	33 (55%)
Positive sputum smear pulmonary cases[3]	18 (62%)	20 (71%)	15 (54%)	13 (57%)	18 (55%)

[1]Denominator for percentage is total number of TB cases
[2]Denominator for percentage is total number of pulmonary TB cases
[3]Denominator for percentage is number of pulmonary cases with sputum smear taken

Source: NTBS, 2024

Table 8 Number and percentage of TB cases in Wales with previous diagnosis, 2020-2024

Previous Diagnosis	2020	2021	2022	2023	2024
Yes	Less than 5	5 (6%)	Less than 5	Less than 5	Less than 5
No	74 (94%)	74 (82%)	34 (48%)	58 (70%)	66 (69%)
Not reported	Less than 5	11 (12%)	33 (46%)	22 (27%)	25 (26%)
Total cases	**79**	**90**	**71**	**83**	**95**

Source: NTBS, 2024

Where reported, 100% of cases in 2024 with a previous diagnosis had received treatment for their previous episode.

4.2 Multi-drug (MDR) and extensively drug resistant (XDR) cases

MDR TB is defined as resistant to both rifampicin and isoniazid, two front line anti-biotics used to treat TB. In 2021, the WHO created new definitions of pre-XDR and XDR[7]:

- Pre-XDR: TB strains fulfilling MDR definition with additional resistance to any fluoroquinolone
- XDR: TB strains fulfilling MDR definition with additional resistance to any fluoroquinolone and at least one Group A drug.

The WHO report that in 2023 there was a small decrease (1%) in the number of people treated for MDR-TB globally compared to 2022[8]. Data is not yet available for 2024.

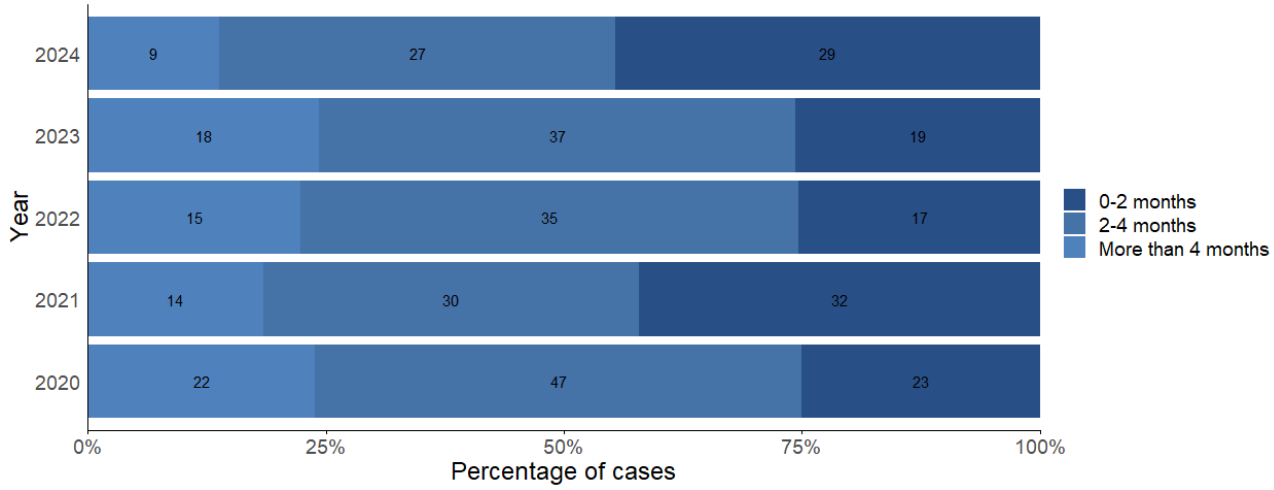
In the last 5 years, 3 MDR cases have been reported via NTBS, however, 5 further cases were either not rifampicin resistant (MDR marker) or not reported as MDR on NTBS but have received MDR treatment.

[7] World Health Organisation (WHO) - https://www.who.int/news/item/27-01-2021-who-announces-updated-definitions-of-extensively-drug-resistant-tuberculosis
[8] World Health Organisation (WHO) - 2.4 Drug-resistant TB treatment

5 Treatment and outcomes

5.1 Symptom onset to treatment initiation

Figure 12 Time between symptom onset and start of treatment for TB cases in Wales, 2020-2024



Source: NTBS, 2024

In 2024:

- Of symptomatic cases, the proportion starting treatment less than two months after symptom onset increased from 26% in 2023 to 45% in 2024
- 14% of pulmonary cases started treatment over four months after symptom onset, compared to 24% in 2023 (Table 9).

There may be several factors influencing this delay from symptom onset to treatment start including healthcare seeking behaviour or delays in the clinical pathway. Delays in seeking care, particularly amongst smear positive pulmonary cases represent a potential risk of transmission to others.

Table 9 Pulmonary TB cases with a time over four months between symptom onset and start of treatment in Wales, 2020-2024

Symptom onset to treatment start	2020	2021	2022	2023	2024
More than 4 months	11 (26%)	7 (13%)	9 (22%)	10 (21%)	Less than 5

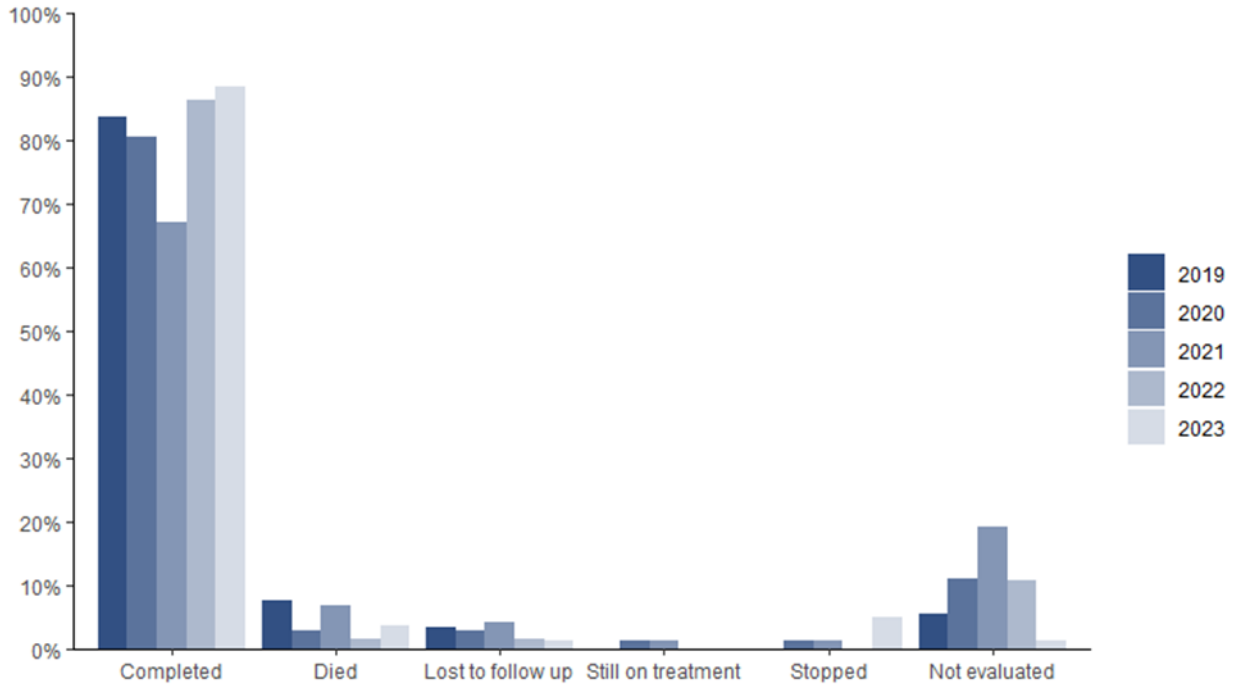
Source: NTBS, 2024

5.2 Treatment outcomes

Treatment outcome data for the drug sensitive cohort is routinely reported according to the year of notification. Outcome data for 2024 are not yet complete due to the duration of treatment.

Outcome data are available for 78 (94%) cases newly diagnosed in 2023[9]. The proportion of drug sensitive cases with expected treatment duration of less than 12 months and who had completed treatment increased from 86% to 89% from the previous year.

Figure 13 TB treatment outcome at 12 months for drug sensitive cases with expected treatment duration greater than 12 months, Wales, 2019-2023



Source: NTBS, 2024

[9] 5 cases excluded due to initial and amplified rifampicin resistance and MDR-TB treated cases and those with CNS, spinal, miliary or cryptic disseminated TB.

Tables 10 and 13 show treatment outcome by age group, sex profile, health board of residence and site of disease respectively.

Table 10 TB treatment completion at 12 months by age group[1] for drug sensitive cases with expected treatment duration less than 12 months, Wales, 2019-2023

Year	5-14	15-24	25-34	35-44	45-54	55-64	65+
2019	8 (100%)	11 (73%)	16 (84%)	14 (82%)	8 (80%)	6 (50%)	11 (73%)
2020	0	9 (100%)	13 (72%)	10 (67%)	11 (69%)	6 (75%)	10 (77%)
2021	Less than 5 (100%)	Less than 5 (43%)	16 (59%)	9 (60%)	7 (44%)	5 (45%)	8 (67%)
2022	0	Less than 5 (100%)	15 (75%)	12 (80%)	11 (79%)	Less than 5 (60%)	11 (85%)
2023	Less than 5 (67%)	5 (71%)	13 (81%)	14 (78%)	13 (93%)	8 (80%)	8 (73%)

[1]9 cases were removed from table due to low numbers

Source: NTBS, 2024

Table 11 TB treatment completion at 12 months by sex for drug sensitive cases with expected treatment duration less than 12 months, Wales, 2019-2023

Sex	2019	2020	2021	2022	2023
Female	30 (91%)	21 (81%)	24 (73%)	30 (88%)	31 (84%)
Male	47 (80%)	37 (80%)	25 (62%)	26 (84%)	33 (80%)

Source: NTBS, 2024

Table 12 TB treatment outcome at 12 months by Health Board of residence for drug sensitive cases with expected treatment duration less than 12 months, Wales, 2019-2023

LHB	2019	2020	2021	2022	2023
Aneurin Bevan UHB	24 (77%)	15 (88%)	12 (75%)	18 (100%)	21 (88%)
Betsi Cadwaladr UHB	13 (87%)	8 (80%)	13 (76%)	7 (88%)	Less than 5 (40%)
Cardiff and Vale UHB	21 (91%)	22 (96%)	15 (94%)	16 (94%)	17 (85%)
Cwm Taf Morgannwg UHB	10 (77%)	7 (100%)	5 (71%)	9 (90%)	Less than 5 (100%)
Hywel Dda UHB	Less than 5 (67%)	Less than 5 (100%)	Less than 5 (40%)	Less than 5 (100%)	5 (83%)
Powys THB	Less than 5 (100%)	Less than 5 (33%)	0	0	Less than 5 (75%)
Swansea Bay UHB	Less than 5 (100%)	Less than 5 (25%)	0	Less than 5 (25%)	9 (75%)
Resident Outside of Wales	0	Less than 5 (50%)	Less than 5 (100%)	Less than 5 (100%)	6 (100%)

Source: NTBS, 2024

Table 13 TB treatment outcome at 12 months by site of disease for drug sensitive cases with expected treatment duration less than 12 months, Wales, 2023[a]

Site of disease	Completed	Died	Lost to follow-up
Pulmonary only	26 (87%)	Less than 5	Less than 5
Pulmonary, with or without EP	31 (89%)	Less than 5	Less than 5
Extra-pulmonary only	33 (100%)	0	0
Extra-thoracic lymph nodes	22 (100%)	0	0
Intra-thoracic lymph nodes	Less than 5	0	0
Pleural	Less than 5	0	0
All other EP sites	10 (100%)	0	0
Total[b]	**64 (94%)**	**Less than 5**	**Less than 5**

[a]Excludes initial and amplified to rifampicin resistant TB and MDR-TB treated cases and those with CNS, spinal, miliary or cryptic disseminated TB
[b]All other extra-pulmonary sites includes gastrointestinal, genitourinary, laryngeal, other and unknown extra-pulmonary disease

Source: NTBS, 2024

Of the 35 cases with a reported treatment outcome and pulmonary disease with or without extra-pulmonary disease, 31 (89%) completed treatment. No cases treated in 2023 were still on treatment after 12 months and treatment was stopped in less than 5.

5.2.1 TB related mortality

In the 5 years, 2019-2023, the proportion of deaths in TB cases has remained relatively low, with highs of 9% in 2021, as shown in Table 14.

Table 14 All drug sensitive and severe TB cases reported to have died at last recorded outcome, Wales, 2023

Year	Cases reported	Total deaths	TB caused or contributed to death	TB incidental to death	Unknown	Postmortem
2019	99	7 (7%)	Less than 5	Less than 5	Less than 5	Less than 5
2020	79	Less than 5	Less than 5	Less than 5	Less than 5	Less than 5
2021	90	8 (9%)	Less than 5	Less than 5	5 (62%)	Less than 5
2022	71	Less than 5	Less than 5	Less than 5	Less than 5	Less than 5
2023	83	Less than 5	Less than 5	Less than 5	Less than 5	Less than 5

Source: NTBS, 2024

6 TB prevention and control

Information on pre-entry screening of UK migrants is not routinely available.

The provision of the Bacillus Calmette-Guérin (BCG) vaccine in the NHS vaccination schedule in Wales ceased in 2005; it is only offered to children who are at high risk of coming into contact with someone with TB[10]. The BCG vaccine is effective in protecting young children against severe forms of TB, such as meningitis, but does not prevent primary infection and reactivation of TB infection[11] (previously known as latent infection).

Table 15 Percentage of cases who have received BCG vaccinations and percentage of cases with known status, 2020-2024

Age Group	2020	2021	2022	2023	2024
0-4	-	0% (100%)	0% (100%)	67% (75%)	0% (0%)
5-14	-	100% (100%)	-	0% (0%)	75% (100%)
15-24	67% (67%)	33% (43%)	100% (33%)	100% (29%)	73% (50%)
25-34	77% (72%)	77% (81%)	82% (55%)	100% (56%)	33% (20%)
35-44	50% (53%)	86% (47%)	75% (27%)	67% (33%)	100% (43%)
45-54	85% (81%)	100% (69%)	80% (36%)	62% (57%)	100% (25%)
55-64	100% (75%)	100% (45%)	67% (60%)	83% (60%)	0% (10%)
65+	43% (54%)	71% (58%)	75% (31%)	57% (64%)	50% (25%)

Source: NTBS, 2024

Of those with a known BCG vaccination status, 77% of cases in 2024 had been vaccinated previously, an increase from 2023 (76%). The highest rates of vaccination were in the 35-44 and 45-54 year old age groups, where 100% with known status were vaccinated.

[10] Public Health Wales (PHW) https://phw.nhs.wales/topics/immunisation-and-vaccines/bcg-tb-vaccine/
[11] World Health Organisation (WHO) https://www.who.int/teams/health-product-policy-and-standards/standards-and-specifications/norms-and-standards/vaccines-quality/bcg

7 Whole genome sequencing

Whole genome sequencing (WGS) of tuberculosis isolates was introduced to Wales in 2019 in order to carry out species typing, resistance typing and cluster analysis. Wales has a TB Cluster Peer Review panel that meeting bi-monthly to consider management of clusters and further public health actions.

A cluster identified with WGS id defined as "2 or more persons with a diagnosis of active TB that have less than 12 SNP difference"[12]. SNP difference refers to single polynucleotide polymorphisms (SNPs), a mutation at a single position in the DNA sequence. Whole-genome SNP comparison is performed to identify SNPs that differ between isolates in a genotype-matched cluster. While a 12 SNP difference can be defined as the upper threshold of genomic relatedness between epidemiologically related hosts, lower limits must be assessed on an individual situation or outbreak basis.

Since the introduction of WGS and cluster analysis in Wales in 2019, a total of 37 clusters of TB with two or more Welsh cases have been identified.

In 2024, 4 new genomically linked clusters were identified. Of the 95 cases notified in 2024, 17 individuals were linked to clusters and were distributed across 10 clusters. Of these cases:

- The majority of cases were *Mycobacterium tuberculosis*
- None were considered multi-drug resistant (MDR)
- The majority of cases (65%) were pulmonary with or without extra-pulmonary disease, with 8/11 (72%) having a positive sputum smear result
- A third of clustered TB cases were observed in Aneurin Bevan University Health Board

Reporting of clusters identified with WGS is undertaken by Public Health Wales Communicable Disease Surveillance Centre to Support Health Protection control measures. As such, these reports are restricted.

[12] UKHSA Mycobacterium tuberculosis whole-genome sequencing and cluster investigation handbook. Available at: https://www.gov.uk/government/publications/tb-strain-typing-and-cluster-investigation-handbook/mycobacterium-tuberculosis-whole-genome-sequencing-and-cluster-investigation-handbook