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Tuberculosis in Wales Annual Report

Data to the end of 2023

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 data provided by UK Health Security Agency (UKHSA), and supplemented using NTBS, to describe clusters of TB infection 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 71 in 2022 to 84 in 2023, representing an increase in annual incidence from 2.3 to 2.7 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.
- Aneurin Bevan and Cardiff and Vale University Health Boards continue to have the highest rates of TB (4.4 per 100,000 population in 2023 each).
- In 2023, rates of TB remained higher amongst males with 2.9 per 100,000 population compared to 2.5 per 100,000 population in females, consistent with previous years with the exception of 2022. The majority of cases are within the 25-54 year age group for both males and females accounting for 68% and 41% in UK born and non-UK born cases respectively
- Three in five (60%) newly diagnosed TB cases in Wales in 2023 were in people born outside the United Kingdom. Of these cases, 21% had an interval period of over 11 years between arrival in the UK and notification to the NTBS (median 4 years, IQR 1-9 years). It is not known what proportion of these cases are the result of reactivation of latent disease 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 (99.6 per 100,000 and 72.2 per 100,000 population respectively).
- Overall, 14% of TB cases in 2023 self-reported having at least one social risk factor, with drug misuse being the most prevalent risk factor (12%). Ten percent self-reported having two or more risk factors.

- Social risk factors were more frequently reported in UK-born cases with 32% of those reported having at least one social risk factor compared to 2% in the non-UK born cases.
- TB infection is more frequently reported in those living in the most deprived areas of Wales. The five-year average rate of TB was over four-times greater in those living within the most deprived decile compared to the least deprived (6.9 and 1.6 per 100,000 population respectively).
- In 2023, 74% of all cases were culture confirmed. The majority (56%) of TB cases in 2023 had a pulmonary site of infection, with 83% of these cases having culture confirmation. This remains above the European Centre for 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, 57% were sputum smear positive indicating high potential risk of onward infection.
- To date, treatment outcome data have been provided on NTBS for all cases in Wales in 2022, an improvement from 96% in the previous year.
- Of the 66 TB cases exhibiting symptoms in 2023, NTBS reports that 26% had started treatment within two months of symptom onset. However, 21% of pulmonary cases started treatment more than four months after displaying symptoms.
- Trends in drug resistant TB in Wales remain low with those identified with 'any resistance to one or more first line drugs' at 0% in 2023.

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 is carried out by UKHSA and data is cleaned to ensure deduplication across 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.

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

2.3 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 through the Forest pipeline using WGS results. There is a 12 single nucleotide polymorphism (SNP) distance cut-off for clustering isolates. Public Health Wales link 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 density). Population statistics for gender, age and location of residence are based on 2022 mid-year figures². Population estimates for Ethnicity are based on the 2021 ONS census³.

² Office for National Statistics. Mid-2022 population estimates. [Estimates of the population for England and Wales - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/estimates-of-the-population-for-england-and-wales-2022)

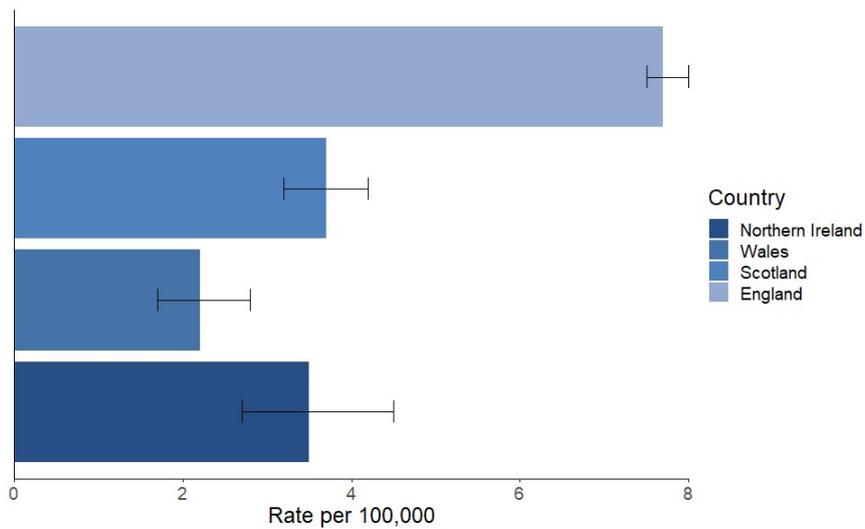
³ Office for National Statistics. 2021 census - Ethnicity and National Identity in England and Wales: 2021 [ONS 2021 Census data - Ethnicity](https://www.ons.gov.uk/peoplepopulationandcommunity/ethnicityandnationalidentity/articles/2021-census-ethnicity-and-national-identity-in-england-and-wales)

3 Tuberculosis (TB) notifications and incidence

In 2023, a total of 84 newly diagnosed cases of TB were reported in Wales. This represents an increase of 18% from the previous year (71 cases, 2.3 per 100,000 population).

The rates of TB in Wales remain the lowest in the UK with a rate of 2.3 per 100,000 in 2022 compared to the UK rate of 7.0 per 100,000 population. Four nations data are not yet available for 2023.

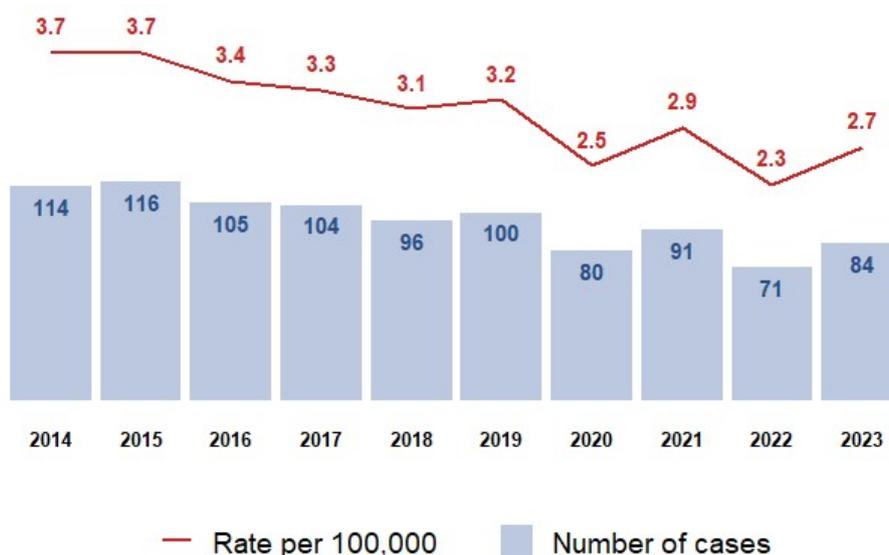
Figure 1 Rates of Tuberculosis per 100,000 population in the UK, 2022



Source: NTBS, 2023

Notifications and rates of TB in Wales have decreased by 27% over the past ten years from 2014 to 2023 (Figure 2).

Figure 2 Number of Cases and Rate of TB per 100,000 population (red line) in Wales, 2014-2023



Source: NTBS, 2024

3.1 Demographic profile of TB cases

3.1.1 Geographical distribution

In 2023, the highest number of new TB cases reported were resident in the Aneurin Bevan University Health Board and Cardiff and Vale University Health Board areas (26 and 22 cases respectively), representing a rate of 4.4 per 100,000 population for both health boards. The lowest rate was reported in Cwm Taf Morgannwg University Health Board at 0.2 per 100,000 population. Rates per 100,000 population by health board of residence are shown in Table 1.

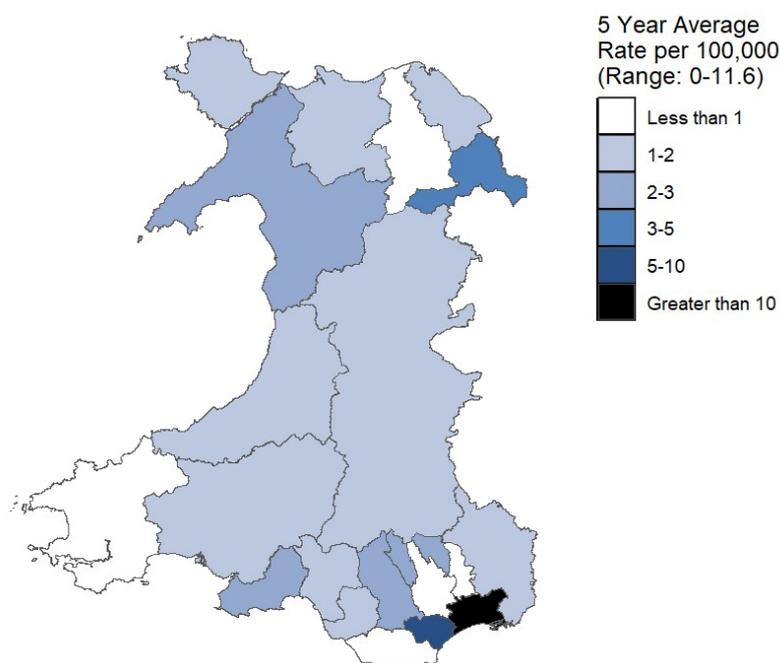
Table 1 Rates per 100,000 population by health board of residence 2019 to 2023, Wales

Local Health Board	2019	2020	2021	2022	2023
Aneurin Bevan UHB	5.2	3.0	3.4	3.2	4.4
Betsi Cadwaladr UHB	2.6	1.3	2.2	1.5	0.7
Cardiff and Vale UHB	5.4	5.2	4.7	3.8	4.4
Cwm Taf Morgannwg UHB	3.1	1.8	2.7	2.3	0.2
Hywel Dda UHB	0.8	0.5	1.8	0.5	1.6
Powys THB	2.3	3.0	0.7	0.0	3.0
Swansea Bay UHB	1.0	2.3	2.4	2.3	3.7

Source: NTBS, 2024

Within health board area there is substantial variation in case rates by local authority of residence, as shown in Figure 3, with Newport and Cardiff reporting the highest rates year on year, with 5-year average rates (2018-2022) of 11.6 and 6.4 per 100,000 population respectively.

Figure 3 Five-year average rate of TB per 100,000 population by Local Authority of Residence, 2019-2023



Source: NTBS, 2024

3.1.2 Sex and age distribution

Of the 84 cases reported in 2023, 52% were male and 48% female (rates of 2.9 and 2.5 per 100,000 population respectively), a consistent trend over time with the exception of 2022, where the majority of cases were female (Table 2).

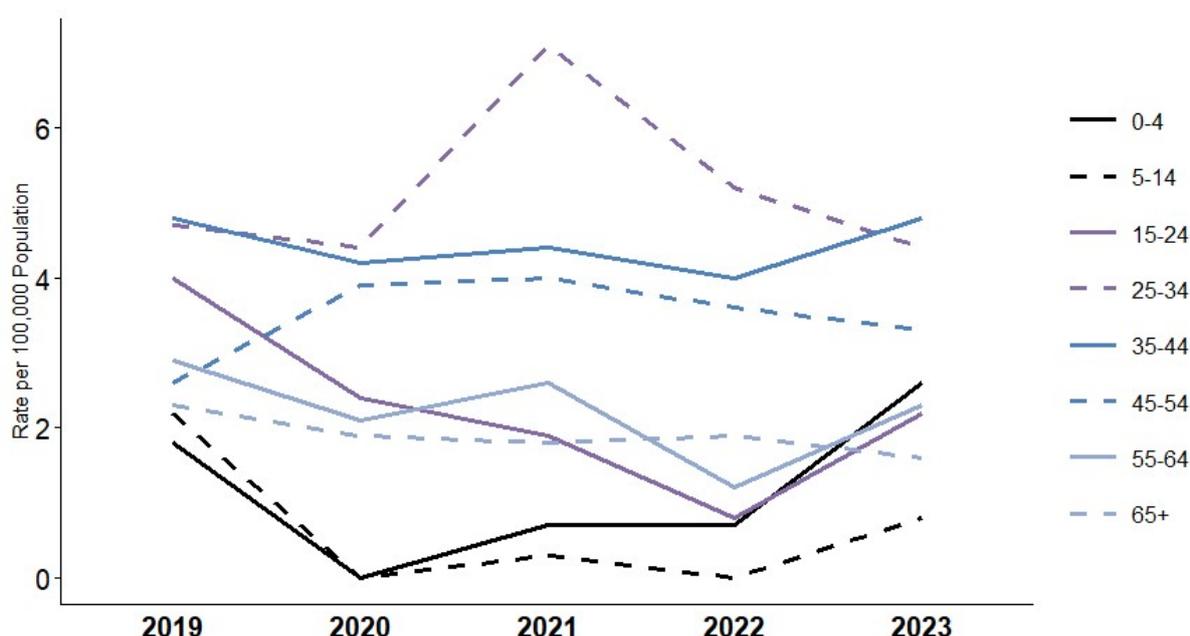
Table 2 Number of notifications and rate of TB in Wales by sex, Rate (Cases) 2019-2023

Sex	2019	2020	2021	2022	2023
Female	2.1 (34)	1.8 (29)	2.3 (37)	2.3 (37)	2.5 (40)
Male	4.2 (66)	3.3 (51)	3.6 (54)	2.2 (34)	2.9 (44)
Total	100	80	91	71	84

Source: NTBS, 2024

The TB incidence rate in those aged 35-44 has increased and is now greater than the rate in the 25-34 year age group (4.8 and 4.4 per 100,000 population respectively). The case rate in those aged 0-4 and 5-14 have risen in 2023, as shown in figure 4.

Figure 4 Rate of TB per 100,000 population by age group and year 2019-2023



Source: NTBS, 2024

3.1.3 Country of birth and ethnicity

Country of birth

Whilst 60% of TB cases reported in Wales were born overseas in 2023 (Table 3), the relative number has decreased only marginally compared to the increase of those born in the UK.

Table 3 Number and proportion (%) of TB cases UK and non-UK born by year, 2019-2023

Place of Birth	2019	2020	2021	2022	2023
Born Abroad	53 (53%)	48 (60%)	58 (64%)	55 (77%)	50 (60%)
Born in UK	42 (42%)	30 (38%)	32 (35%)	16 (23%)	34 (40%)
Not Known	5 (5%)	2 (2%)	1 (1%)	0 (0%)	0 (0%)
Total	100	80	91	71	84

Source: NTBS, 2024

Of the 50 cases born outside the UK and notified in 2023, the most frequent countries of birth of cases were India (14%) and Pakistan (11%).

Table 4 Demographics of UK born and non-UK born TB cases in Wales by year, 2019-2023

		2019		2020		2021		2022		2023	
		Non-UK born	UK born								
Sex	Female	17	16	19	9	24	13	29	8	28	12
	Male	36	26	29	21	34	19	26	8	22	22
Age Group	0-24	13	13	≤5	≤5	≤5	≤5	≤5	≤5	9	6
	25-54	30	16	36	13	42	17	44	5	34	14
	55+	10	13	7	14	11	11	10	8	7	14

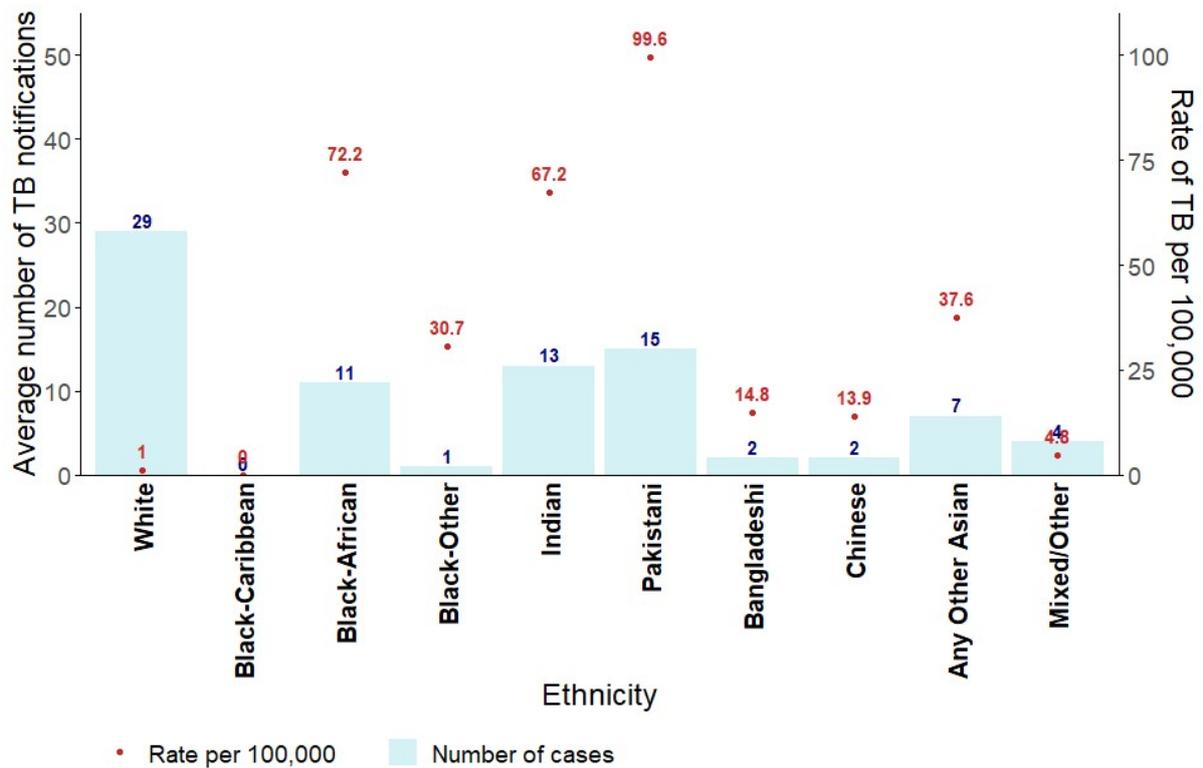
There has been a higher number of non-UK born female cases compared to UK born in 2023, and the majority of cases born outside of the UK were between the ages of 25 and 54 (Table 4).

Ethnicity

In 2023, over one third (34%) of TB cases were reported in the white ethnic group with the remaining 65% reported within other ethnic groups, a decrease of 12% from 2022. The highest rates have been recorded in the Pakistani, Black-African and Indian populations⁴ (Figure 5).

⁴ Rates per 100,000 population by ethnicity derived using ONS census data 2021. [ONS 2021 census data - ethnicity](#)

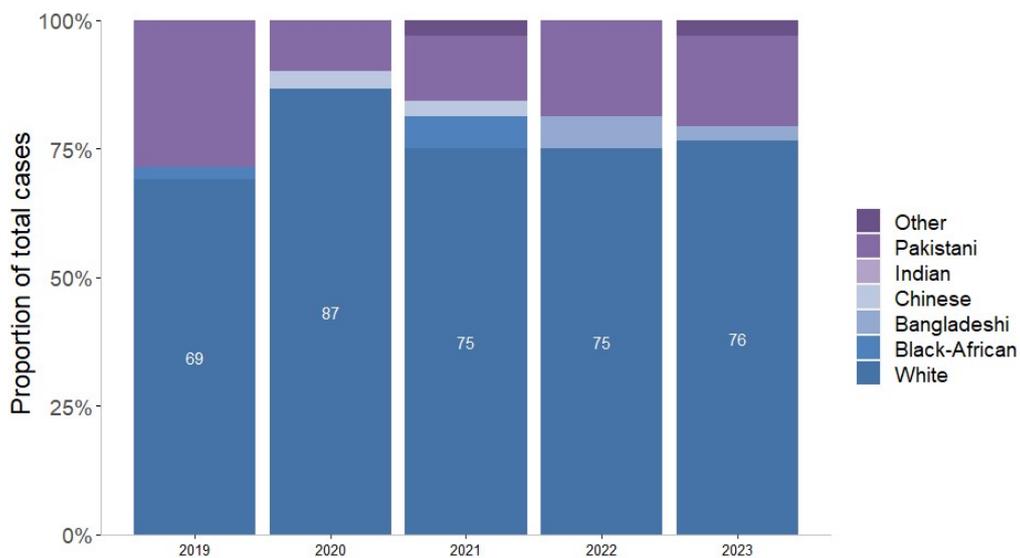
Figure 5 Five-year average annual number of TB cases and rate per 100,000 population by ethnic group, 2019-2023, Wales



Source: NTBS, 2024

In 2023, three quarters (76%) of UK born cases and 6% of non-UK born cases were of White ethnicity. The ethnic profile of UK born TB cases is shown in figure 6.

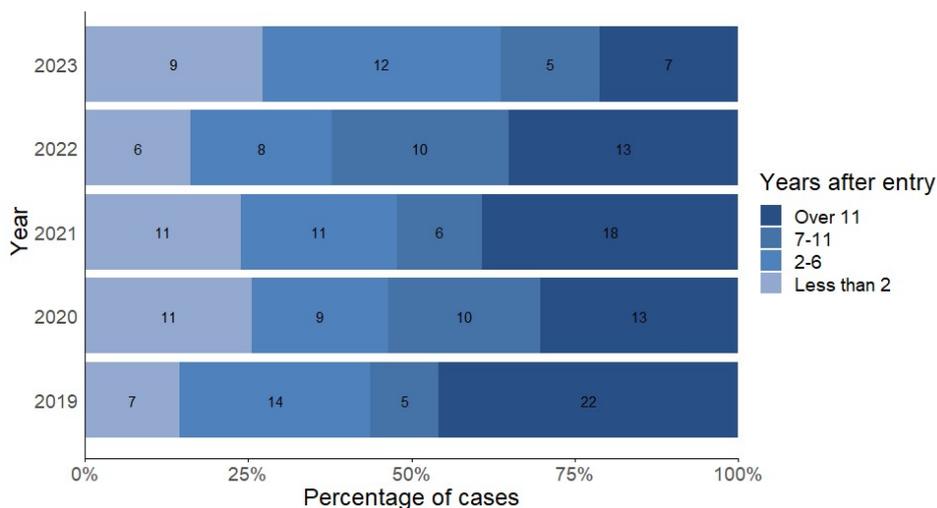
Figure 6 Proportion (%) of UK born TB cases by ethnicity in Wales, 2019-2023



Source: NTBS, 2024

Of the cases notified in 2023 with a date of arrival into the UK, 27% were diagnosed within 2 years of arrival. Around one in five (21%) of cases were diagnosed with TB more than 11 years after arrival (Figure 7). It is not known what proportion of these cases are the result of reactivation of latent disease 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, 2019-2023



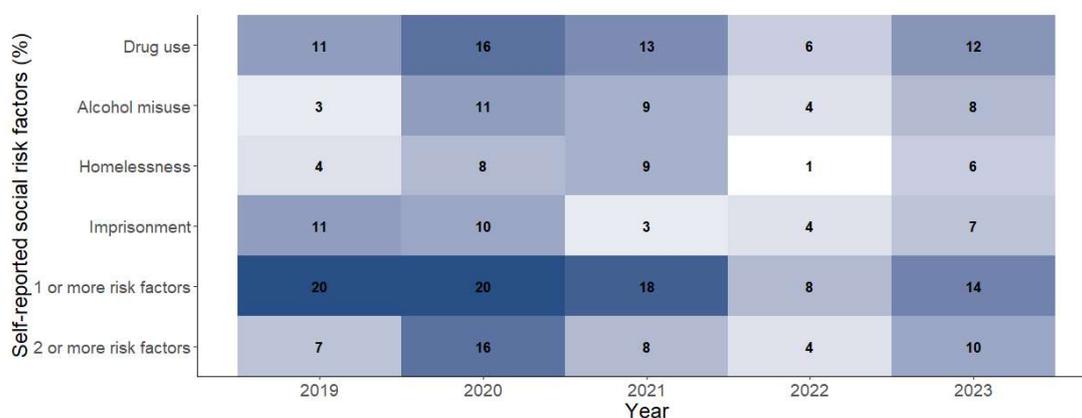
Source: NTBS, 2024

3.1.4 Social risk factors, deprivation and co-morbidities

Self-reported social risk factors

In 2023, overall, 14% of cases self-reported having at least one social risk factors, a reduction compared to the 2019-2021 period, but an increase from 2022 (Figure 8). The most common risk factor in the cohort was drug misuse at 12%. Two or more risk factors, indicative of more complex risk, were reported by 10%, marking a 6% rise from the previous year.

Figure 8 Self-reported history of or current social risk factors among TB patients in Wales 2019-2023

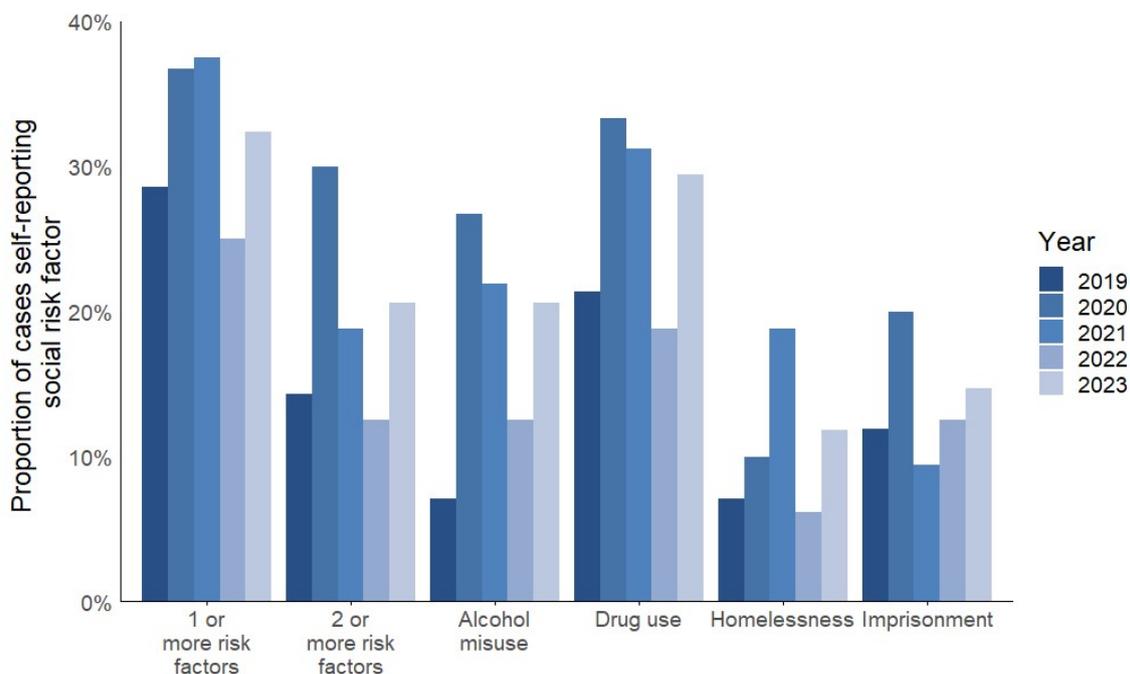


Source: NTBS, 2024

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

In 2023, 32% of UK-born cases reported having at least 1 risk factor and 20% had two or more. The factors with the greatest proportion of cases were drug misuse (29%), alcohol misuse (20%) and imprisonment (15%).

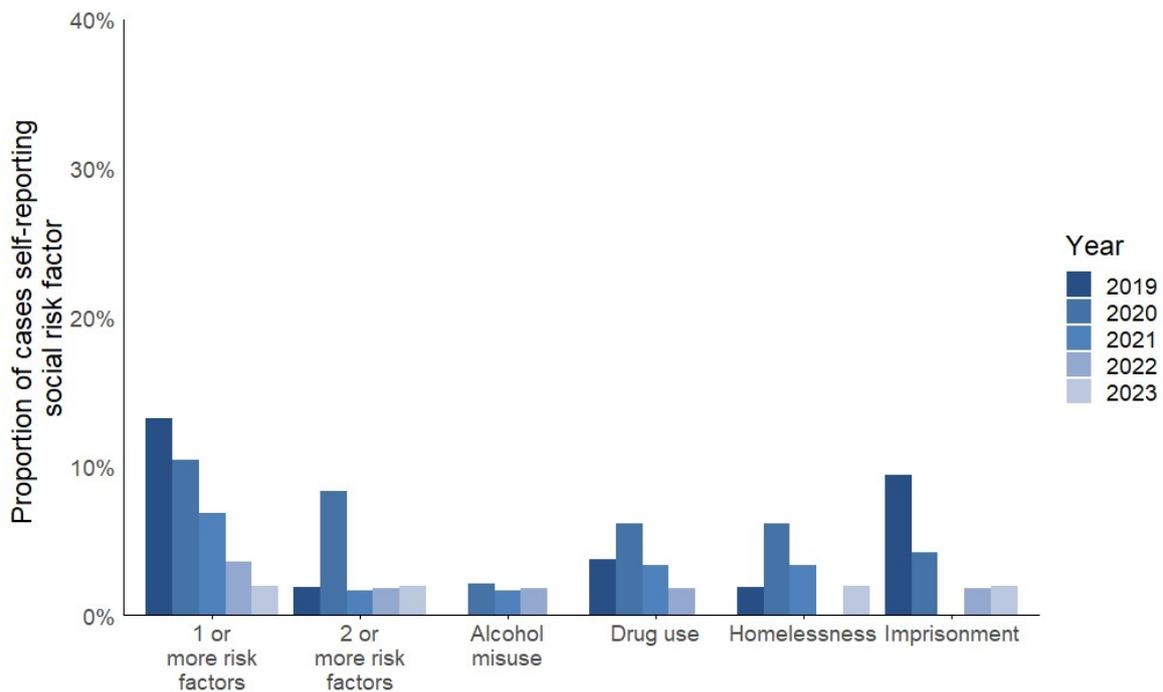
Figure 9 History of or current self-reported social risk factors among UK-born TB patients in Wales, 2019-2023



Source: NTBS, 2024

Of the cases born outside of the UK reported in 2023, 2% reported at least one risk factor and 2% having two or more. Within this population, imprisonment and homelessness were the most frequently reported social risk factors.

Figure 10 History of or current self-reported social risk factors among non-UK born TB patients in Wales, 2019-2023

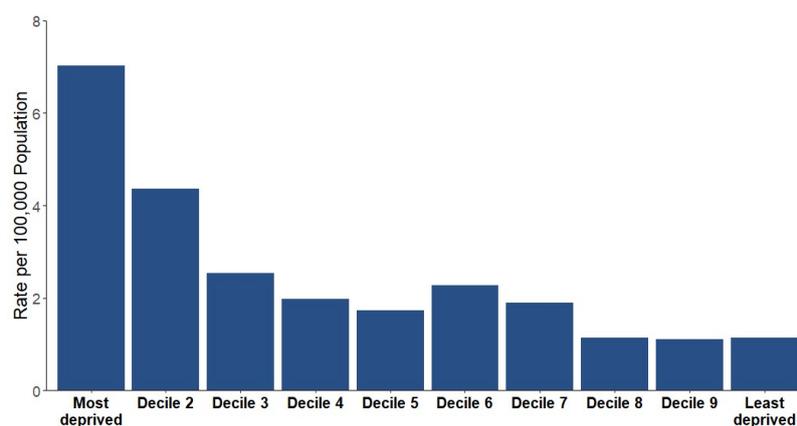


Source: NTBS, 2024

Deprivation

TB infection is more frequently reported in those living in the most deprived communities in Wales (Figure 11). The rate of TB has been highest in the most deprived decile⁵ for the past ten years. In 2023, the rate in the most deprived decile was 6.9 per 100,000 population and 1.6 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, 2019-2023



Source: NTBS, 2024

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

Co-morbidities

Where co-morbidity status was known for those in notified in 2023, 11% of cases had diabetes (Table 5). The next most frequent co-morbidities within the five-year period were immunosuppression and Hepatitis C (4% each).

Table 5 Percentage of TB cases in Wales with co-morbidities, 2019-2023

Comorbidity	5-Year Average (% of total cases)
Diabetes	11%
Hepatitis B Virus	2%
Hepatitis C Virus	4%
Chronic Liver Disease	2%
Chronic Renal Disease	1%
Immunosuppression ¹	4%

¹Immunosuppression 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 tuberculosis with or without extra-pulmonary disease accounted for 56% of cases in 2023 of these 17% also had extra pulmonary disease.

Table 6 Number and percentage of TB cases in Wales by site of disease, 2019-2023, Wales

Site of Disease*	2019	2020	2021	2022	2023
Pulmonary**	75 (75%)	46 (57%)	57 (63%)	41 (58%)	47 (56%)
Extra-thoracic lymph nodes	9 (9%)	9 (11%)	10 (11%)	17 (24%)	24 (29%)
Intra-thoracic lymph nodes	5 (5%)	10 (12%)	10 (11%)	Less than 5	Less than 5
Pleural	9 (9%)	7 (9%)	8 (9%)	7 (10%)	Less than 5
Gastrointestinal	0 (0%)	Less than 5	Less than 5	Less than 5	7 (8%)
CNS-meningitis	Less than 5	Less than 5	Less than 5	0 (0%)	0 (0%)
CNS-other	0 (0%)	Less than 5	Less than 5	Less than 5	0 (0%)
Bone-spine	Less than 5	Less than 5	6 (7%)	Less than 5	Less than 5
Bone-other	Less than 5				
Genitourinary	0 (0%)	Less than 5	Less than 5	Less than 5	Less than 5
Laryngeal	0 (0%)	0 (0%)	Less than 5	0 (0%)	Less than 5
Cryptic	Less than 5	Less than 5	Less than 5	0 (0%)	0 (0%)
Other extra pulmonary	26 (26%)	26 (32%)	21 (23%)	12 (17%)	22 (26%)
Total cases	100	80	91	71	84

*Patients may have disease at more than one site

**Pulmonary TB includes miliary TB in accordance with the WHO's recommendation and international reporting definitions⁷

Source: NTBS, 2024

In 2023, 74% 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 tuberculosis⁶.

Among 62 culture-confirmed cases:

- 90% were due to *M. tuberculosis*
- 3% were due to *M. bovis*
- 2% were due to *M. africanum*
- The remaining 5% cases were not reported

⁶ European Centre for Disease Prevention and Control (ECDC). – [101111_SPR_Progressing_towards_TB_elimination.pdf \(europa.eu\)](https://ecdc.europa.eu/en/101111_SPR_Progressing_towards_TB_elimination.pdf)

Table 7 Number and percentage of TB cases in Wales with bacteriological confirmation, 2019-2023, Wales

Bacteriological Results	2019	2020	2021	2022	2023
Culture confirmed ¹	81 (81%)	66 (82%)	70 (77%)	53 (75%)	62 (74%)
Culture confirmed pulmonary cases ²	63 (84%)	38 (90%)	53 (96%)	34 (85%)	39 (83%)
Pulmonary cases with sputum ²	37 (49%)	29 (69%)	29 (53%)	28 (70%)	23 (49%)
Positive sputum smear pulmonary cases ³	25 (68%)	18 (62%)	21 (72%)	15 (54%)	13 (57%)

¹Denominator for percentage is total number of TB cases

²Denominator for percentage is total number of pulmonary TB cases

³Denominator 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, 2019-2023, Wales

Previous Diagnosis	2019	2020	2021	2022	2023
Yes	7 (7%)	Less than 5	6 (7%)	Less than 5	Less than 5
No	88 (88%)	75 (94%)	74 (81%)	34 (48%)	55 (65%)
Not reported	5 (5%)	Less than 5	11 (12%)	33 (46%)	26 (31%)
Total cases	100	80	91	71	84

Source: NTBS, 2024

Where reported, 67% of cases in 2023 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 a resistance to both rifampicin and isoniazid, two front line antibiotics used to treat TB. In 2021, the WHO created new definitions of pre-XDR and XDR⁷:

- 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 2022 there was a small increase (8.5%) in the number of people treated for MDR-TB globally compared to 2021⁸. Data are not yet available for 2023. In the last 5 years, 3 MDR cases have been reported via NTBS, however, 4 further cases were not rifampicin resistant (MDR marker) but have received MDR treatment.

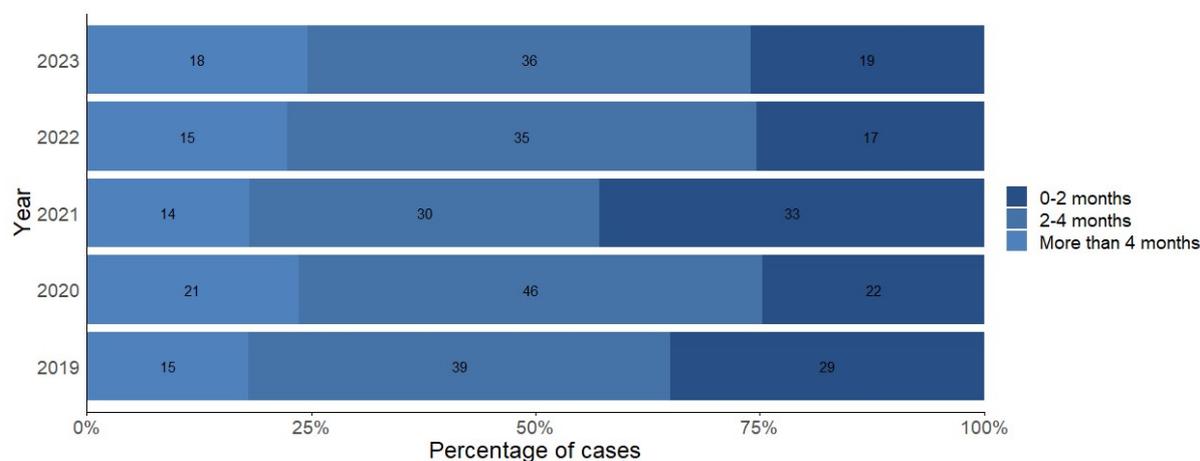
⁷ World Health Organisation (WHO) [WHO announces updated definitions of extensively drug-resistant tuberculosis](#)

⁸ World Health Organisation (WHO) [2.4 Drug-resistant TB treatment \(who.int\)](#)

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, 2019-2023



Source: NTBS, 2024

In 2023:

- Of symptomatic cases, the proportion starting treatment less than two months after symptom onset slightly increased from 25% in 2022 to 26% in 2023
- 21% of pulmonary cases started treatment over four months after symptom onset, compared to 22% in 2022 (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 >4 months between symptom onset and start of treatment in Wales, 2019-2023

Symptom onset to treatment start	2019	2020	2021	2022	2023
More than 4 months	11 (15%)	11 (26%)	7 (13%)	9 (22%)	10 (21%)

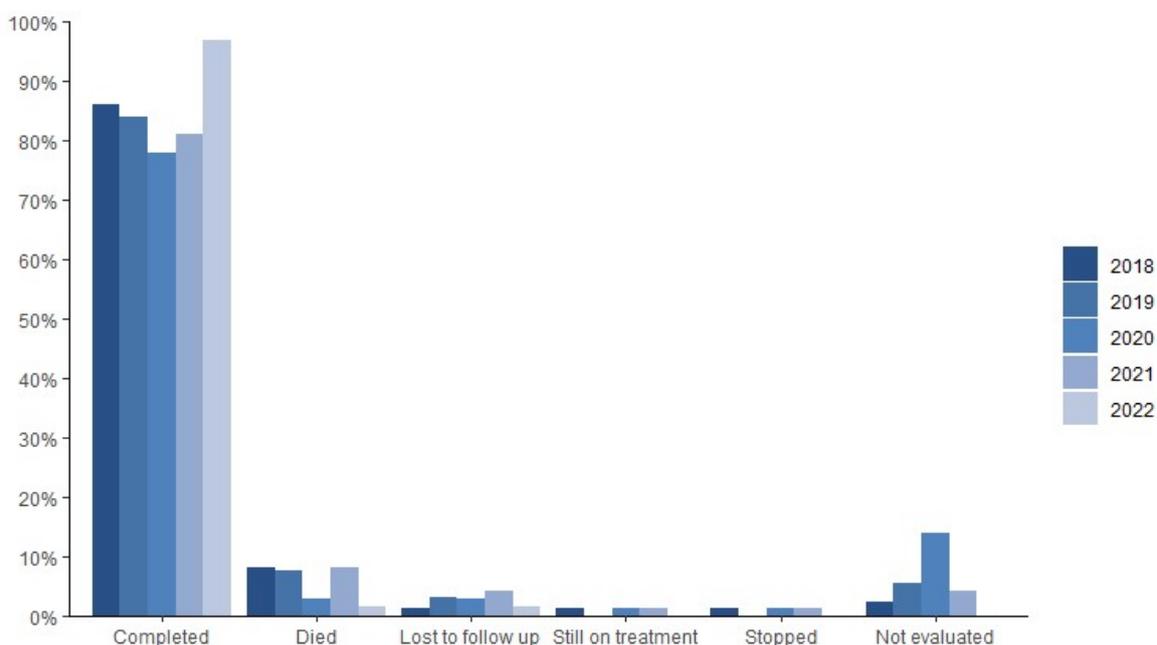
Source: NTBS, 2024

5.2 Treatment outcomes

Treatment outcome data for the drug sensitive cohort is routinely reported according to the year of notification. Outcome data for 2023 are not yet complete due to the duration of treatment.

Outcome data are available for 64 (90%) cases newly diagnosed in 2022⁹. The proportion of drug sensitive cases with expected treatment duration of less than 12 months and who had completed treatment increased from 81% to 97% 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, 2018-2022¹⁰



Source: NTBS, 2024

⁹ 7 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 to 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^a for drug sensitive cases with expected treatment duration greater than 12 months, Wales, 2018-2022¹⁰

Year	5-14	15-24	25-34	35-44	45-54	55-64	65+
2018	0	11 (92%)	14 (78%)	13 (87%)	18 (90%)	11 (79%)	0
2019	8 (100%)	11 (73%)	16 (84%)	14 (82%)	9 (82%)	6 (50%)	11 (73%)
2020	0	9 (100%)	13 (72%)	9 (60%)	10 (62%)	6 (67%)	0
2021	Less than 5 (100%)	5 (71%)	19 (70%)	9 (56%)	11 (69%)	7 (64%)	8 (67%)
2022	0	Less than 5 (100%)	19 (95%)	14 (93%)	12 (86%)	Less than 5 (80%)	0

^a6 cases 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 greater than 12 months, Wales, 2018-2022

Sex	2018	2019	2020	2021	2022
Female	19 (83%)	30 (91%)	20 (77%)	27 (79%)	34 (100%)
Male	54 (87%)	48 (80%)	36 (78%)	33 (82%)	28 (93%)

Source: NTBS, 2024

Table 12 TB treatment outcome at 12 months by Health Board of residence for drug sensitive cases with expected treatment duration greater than 12 months, Wales, 2018-2022

LHB	2018	2019	2020	2021	2022
Aneurin Bevan UHB	12 (75%)	24 (77%)	15 (88%)	12 (71%)	18 (100%)
Betsi Cadwaladr UHB	17 (94%)	14 (88%)	7 (88%)	14 (93%)	7 (88%)
Cardiff and Vale UHB	24 (83%)	21 (91%)	22 (96%)	15 (94%)	16 (94%)
Cwm Taf Morgannwg UHB	6 (100%)	10 (77%)	5 (71%)	5 (71%)	10 (100%)
Hywel Dda UHB	Less than 5 (50%)	Less than 5 (67%)	Less than 5 (100%)	Less than 5 (40%)	Less than 5 (100%)
Powys THB	Less than 5 (100%)	Less than 5 (100%)	Less than 5 (33%)	0	0
Resident Outside of Wales	Less than 5 (100%)	0	Less than 5 (50%)	Less than 5 (75%)	Less than 5 (100%)
Swansea Bay UHB	10 (100%)	Less than 5 (100%)	Less than 5 (25%)	9 (100%)	7 (100%)

Source: NTBS, 2024

Table 13 TB treatment outcome at 12 months by site of disease for drug sensitive cases with expected treatment duration greater than 12 months, Wales, 2022^a

Site of disease	Completed	Died	Lost to follow-up
Pulmonary only	30 (97%)	Less than 5	0
Pulmonary, with or without EP	34 (94%)	Less than 5	Less than 5
Extra-pulmonary only	27 (100%)	0	0
Extra-thoracic lymph nodes	17 (100%)	0	0
Intra-thoracic lymph nodes	Less than 5	0	0
Pleural	6 (86%)	0	Less than 5
All other EP sites ^c	6 (100%)	0	0

^aExcludes initial and amplified to rifampicin resistant TB and MDR-TB treated cases and those with CNS, spinal, miliary or cryptic disseminated TB

^bNot evaluated includes missing, unknown and transferred out

^cAll other extra-pulmonary sites includes gastrointestinal, genitourinary, laryngeal, other and unknown extra-pulmonary disease

Source: NTBS, 2024

Of the 36 cases with a reported treatment outcome and pulmonary disease with or without extra-pulmonary disease, 34 (94%) completed treatment. No cases treated in 2022: were still on treatment after 12 months; stopped treatment; or were not evaluated on NTBS.

5.2.1 TB related mortality

In the 5 years, 2018-2022, the proportion of deaths in TB cases has remained relatively low, with highs of 10% in 2018 and 2021, as shown in Table 14.

Table 14 All drug sensitive and severe TB cases reported to have died at last recorded outcome, Wales, 2018-2022^a

Year	Cases reported	Total deaths	TB caused or contributed to death	TB incidental to death	Unknown	Post mortem
2018	96	10 (10%)	5 (50%)	Less than 5	Less than 5	Less than 5
2019	100	7 (7%)	Less than 5	Less than 5	Less than 5	Less than 5
2020	80	Less than 5	Less than 5	Less than 5	Less than 5	Less than 5
2021	91	9 (10%)	Less than 5	Less than 5	6 (67%)	Less than 5
2022	71	Less than 5	Less than 5	Less than 5	Less than 5	Less than 5

^aExcludes initial and amplified to rifampicin resistant TB and MDR-TB treated cases

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 was ceased in 2005; it is only offered to children who are at higher risk of coming into contact with someone with TB¹⁰. 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 latent infection¹¹.

Table 15 Percentage of cases who have received BCG vaccinations and percentage of cases with known status, Vaccinated% (Known Status %), 2019-2023

Age Group	2019	2021	2022	2020	2023
0-4	0% (67%)	0% (100%)	0% (100%)	-	67% (75%)
5-14	75% (100%)	100% (100%)	-	-	0% (0%)
15-24	78% (60%)	33% (43%)	100% (33%)	67% (67%)	67% (38%)
25-34	85% (68%)	77% (81%)	82% (55%)	77% (72%)	100% (59%)
35-44	79% (82%)	88% (50%)	75% (27%)	50% (53%)	67% (33%)
45-54	86% (64%)	100% (69%)	80% (36%)	85% (81%)	62% (62%)
55-64	50% (50%)	100% (45%)	67% (60%)	100% (78%)	83% (60%)
65+	57% (47%)	71% (58%)	75% (31%)	43% (54%)	57% (64%)

Source: NTBS, 2024

Of those with a known BCG vaccination status, 74% of cases in 2023 had been vaccinated previously, a decrease from 2022 (75%). The highest rates of vaccination were in the 25-34 and 55-64 year old age groups, where 100% and 83% with known status were vaccinated respectively.

¹⁰ Public Health Wales (PHW) [Bacillus Calmette-Guérin Vaccine \(BCG\) / TB vaccine - Public Health Wales \(nhs.wales\)](#)

¹¹ World Health Organisation (WHO) [BCG \(who.int\)](#)

7 Whole genome sequenced clusters

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.

A cluster identified with WGS is 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 basis¹³.

Since the introduction of WGS and cluster analysis in Wales in 2019, a total of 33 clusters of TB with two or more Welsh cases have been identified.

In 2023, 3 new genomically linked clusters were identified. Of the 84 cases notified in 2023, 16 individuals were linked to clusters and were distributed across 7 clusters. Of these cases:

- The majority of cases were *Mycobacterium tuberculosis*
- None were considered Multi-drug resistant (MDR)
- The majority of cases (88%) were pulmonary with or without extra-pulmonary disease, with 5/13 (38%) having a positive sputum smear result.
- The majority (81%) 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: [TB WGS and cluster investigation handbook](#)