



Public Health
England

Tuberculosis in Berkshire: a Health Needs Assessment

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1 Executive Summary

This report presents the findings of a comprehensive assessment of the health and health care needs related to tuberculosis (TB) in Berkshire.

The first section considers the epidemiology of TB in Berkshire, based on data from the Enhanced Tuberculosis Surveillance (ETS) dataset from 2000-2014, and socio-demographic data from the Office for National Statistics (ONS). Key findings include:

- Berkshire has a TB incidence rate of 20.2 per 100,000, which is higher than the incidence rate for England (13.5) and the South East (8.3).
- Within Berkshire, the unitary authorities of Slough and Reading have the highest incidence rates (51.5 and 36.3 per 100,000), and have a higher proportion of their population born outside of the UK, from minority ethnic groups and from areas with higher deprivation scores.
- Three-year average incidence rates in Slough appear to have remained constant over the past 14 years. Rates in Reading show a stark increase over the same period, from 23.1 (2000-2002) to 36.3 per 100,000 (2012-2014).
- Three wards in Reading and six wards in Slough have very high TB incidence rates of 60 cases per 100,000 or more.
- Across Berkshire, the majority of cases were born in India (n=416), Pakistan (n=247), UK (n=224) or Nepal (n=97).
- Few cases in Berkshire have social risk factors when compared to the rest of England (0.7-1.1% vs 3.3-3.4%)
- Fifteen wards across Berkshire have an incidence greater than 40 per 100,000 (defined as high incidence areas in the TB Green Book)

The second section considers current service provision in Berkshire, which is primarily run for the West of Berkshire (Reading, Wokingham, West Berkshire) via Royal Berkshire Hospital NHS Foundation Trust, and for the East of Berkshire (Slough, Windsor and Maidenhead) via Frimley Health NHS Foundation Trust. Through interviews with service providers, and an analysis of data from the TB-ETS (Enhanced Tuberculosis Surveillance) dataset, the assessment found the following areas of strong performance and areas that could be improved.

Areas of good performance:

- The majority of cases seen in both TB services start treatment within 2 months of symptom onset (58.5% in Berkshire West, 55.7% in Berkshire East), this is much higher than in the South East (30.7%) and England (39.5).
- The vast majority completed their course of treatment within 12 months (89.7% in Berkshire West and 90.5% in Berkshire East). This is higher than the average of 84.8% for England and 86.2% in South East.

Areas for improvement:

- A comparison of staffing levels delivering the TB services in Berkshire East and Berkshire West, shows that the former has 1 nurse per 32 TB cases, while the latter has 1 nurse per 42 cases. Furthermore, this staffing level in Berkshire West covers management of active cases, as well as screening and management of latent TB, whereas in Berkshire East there is an

additional and administrator for the latent TB services. This may need to be reviewed given the increasing trend in cases in Reading.

- Since the closure of the Port Health Authority referral scheme, there has been a reduction in the flow of patients into new entrant screening services in Berkshire. This has been particularly evident in the West of Berkshire. In the East of Berkshire, a small number of GP practices continue to refer patients but there is considerable room to improve the identification and referral process to increase the number of eligible new entrants who are screened in both services.
- Both services report difficulty in arranging social support and housing for cases with complex social needs and both identified a role for working with and engaging community groups.
- Historically neonatal BCG policy has differed in East and West Berkshire, recent changes to the national service specification offer an opportunity to create a single policy across Berkshire..

Berkshire benefits from strong local services and dedicated staff within those services. However the area faces a variety of issues, highlighted in this report, which shall require addressing in order to strengthen local provision. Recommendations to achieve this are listed in relation to the ten 'areas for action' identified in the Collaborative Tuberculosis Strategy for England.

2 Introduction

2.1 Background

The Collaborative Tuberculosis Strategy for England 2015 to 2020¹ sets out a vision for how high-quality and cost-effective TB control can be achieved. Formal TB control boards have been established that cover the whole of the country to enable co-ordinated action of key partners and develop clear lines of accountability. It is expected TB control boards will work closely with local TB networks, who will ultimately deliver the local TB strategy. TB HNAs will support local TB networks in answering the following strategic questions:

- Should a universal or targeted strategy be deployed to reduce TB incidence?
- Are the correct composite of services in place to manage the needs of individuals affected by TB and are there any significant gaps in terms of provision and capacity to deliver?
- Where should commissioners target their resources in order to reduce TB incidence and maximise treatment outcomes?
- What are the three priority objectives the TB network should focus on and monitor over the year ahead in order to reduce TB incidence and maximise treatment outcomes?

2.2 Aims

The overall aim of this project is to produce a comprehensive TB Health Needs Assessment for Berkshire.

This will be done by describing the epidemiology of TB, establishing a baseline for current TB services, considering the unmet health needs and gaps in service provision, and making recommendations on how to meet these needs and improve the treatment and control of TB in Berkshire.

3 Epidemiology

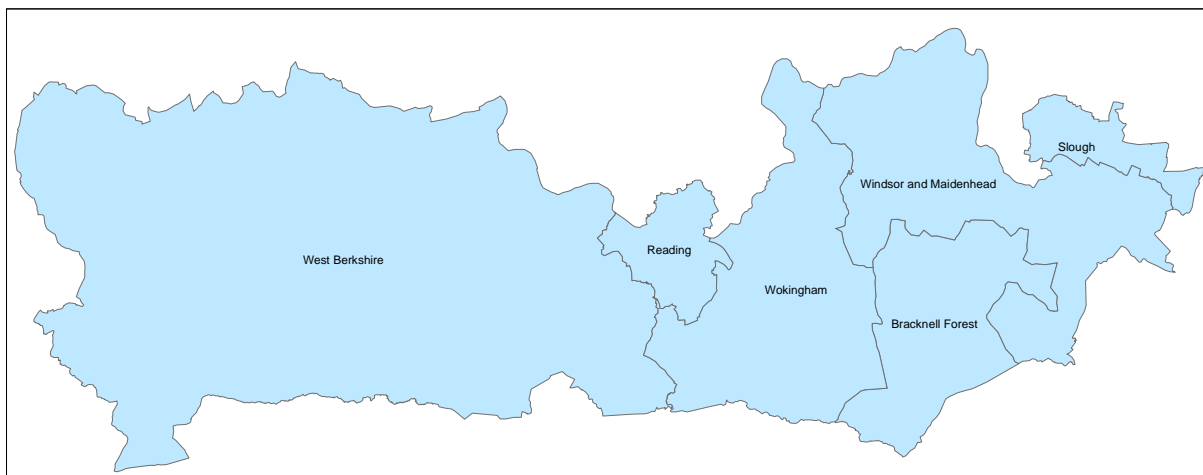
This section considers the epidemiology of TB in Berkshire, primarily based on data from the Enhanced Tuberculosis Surveillance (ETS) dataset covering 2008-2014, and with some reference to socio-demographic data from the Office for National Statistics (ONS). For most of this section, the data is grouped by unitary authority boundaries, but, where available, a breakdown by Clinical Commissioning Group or smaller geographic areas has been included. For some tables and graphs, 2015 data (not yet complete) has been included if annual trends are not being considered. Where annual trends have been considered, this has been displayed for 2000-2014. Finally, where possible, comparisons have been made to the epidemiology of TB in England, the South East and Thames Valley.

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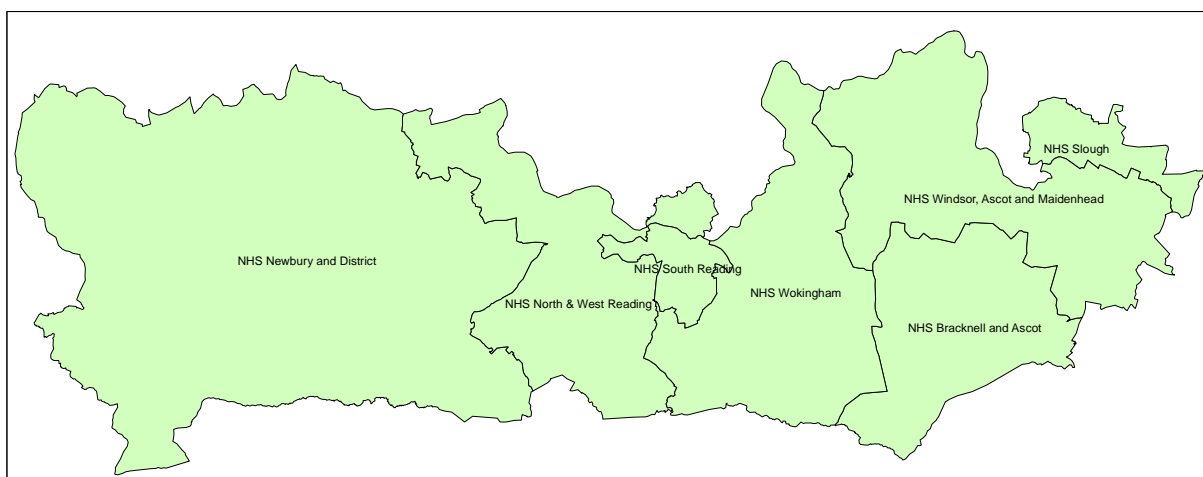
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/403231/Collaborative_TB_Strategy_for_England_2015_2020_.pdf

3.1 Demography of the local population

The county of Berkshire has a population of around 900,000² and consists of six unitary authorities: West Berkshire, Reading, Wokingham, Bracknell Forest, Windsor and Maidenhead, Slough (see Map 1). Health services are commissioned by seven Clinical Commissioning Groups (CCGs): Newbury and District CCG, North and West Reading CCG, South Reading CCG, Wokingham CCG, Bracknell and Ascot CCG, Windsor, Ascot and Maidenhead CCG and Slough CCG (see Map 2).

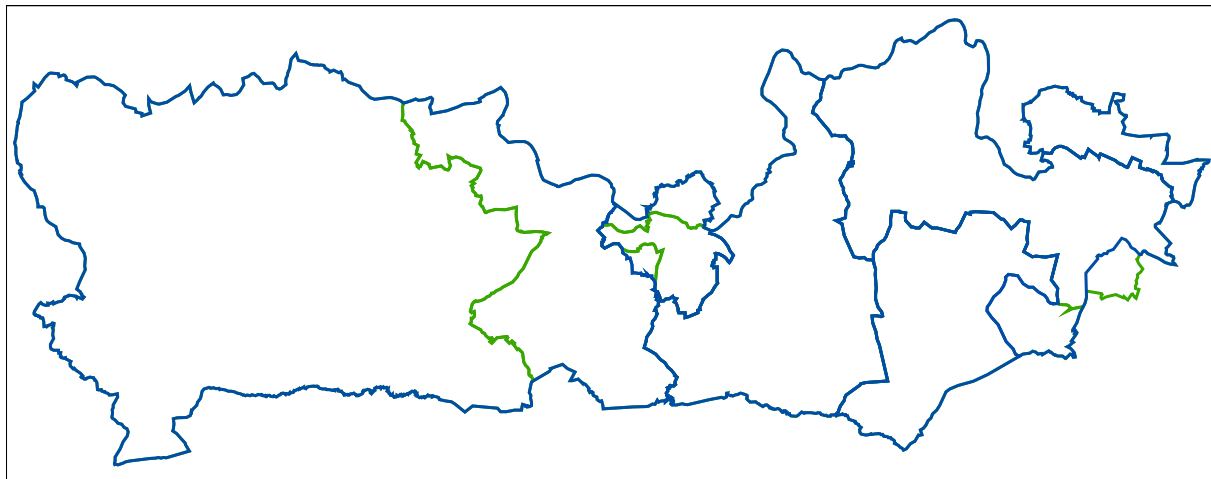


Map 1 Unitary authority boundaries in Berkshire



Map 2 CCG boundaries in Berkshire

² See breakdown in Table 1



Map 3 Unitary authority and CCG boundaries in Berkshire†

† Unitary authority boundaries in blue, CCG boundaries in green.

As shown in Map 3, The CCGs (green) cover similar areas to the unitary authorities (blue) but are not coterminous. The main differences are that North and West Reading CCG covers a large part of West Berkshire and parts of Reading, and that Ascot is covered by two CCGs. In addition, Windsor, Ascot and Maidenhead CCG extends beyond Berkshire into Surrey.

Each unitary authority has a population of around 145,000 to 160,000, except for Bracknell Forest with a population of around 120,000. The unitary authorities each vary in terms of the socio-demographics of their local population, as can be seen in Table 1.

The populations born outside of the UK and ethnic diversity are highest in Slough and Reading, where 34.5% and 65.3% of the population are white and UK-born. In West Berkshire, Wokingham, Bracknell Forest and Windsor and Maidenhead, a larger proportion of the population is white and UK-born (90.4%, 83.6%, 84.9% and 77.5%, respectively).

A similar pattern can be seen for socio-economic indicators, as represented by the Index of Multiple Deprivation (IMD), which is based on the following domains (with weighting in parentheses):

- Income Deprivation (22.5%)
- Employment Deprivation (22.5%)
- Education, Skills and Training Deprivation (13.5%)
- Health Deprivation and Disability (13.5%)
- Crime (9.3%)
- Barriers to Housing and Services (9.3%)
- Living Environment Deprivation (9.3%)

Two indices from the IMD are presented in Table 1. The first indicator, “IMD rank”, represents the rank of the local authority compared to all others in the country. It is generated by averaging the ranks of all the small areas that form the authority area (lower super output areas or LSOAs) and then ranking it against all other authorities to give a rank out of 326, with 1 being the most deprived and 326 being least deprived.

The second indicator, “IMD extent”, represents the proportion of that local authority’s population living in the most deprived 30% of LSOAs in the country, with a weighting that is skewed towards the most deprived 10%.

As shown in Table 1, West Berkshire, Wokingham, Bracknell Forest and Windsor and Maidenhead, have populations that have some of the lowest deprivation scores for England (rank 291, 325, 287 and 306, respectively) and with only 0-1% of their populations living in the most deprived LSOAs. In contrast, Slough ranks as 79th most deprived, with 11% of population living in the most deprived wards. Reading also has 11% of the population living in the most deprived wards, but ranks 143rd most deprived. This difference between Reading and Slough is because the ranking method means that areas that are more uniformly deprived will rank higher than those with polarised deprivation³, despite the same proportion of the population living in the most deprived LSOAs.

Table 1 Population, ethnicity and index of multiple deprivation for unitary authorities in Berkshire

	Local authority	Population estimate ⁱ	White UK population (%) ⁱⁱ	IMD Rank ⁱⁱⁱ (out of 326)	IMD Extent
West	West Berkshire	155,732	90.4	291	0.0106
	Reading	160,825	65.3	143	0.1137
	Wokingham	159,097	83.6	325	0
East	Bracknell Forest	118,025	84.9	287	0.0031
	Windsor and Maidenhead	147,400	77.5	306	0.0014
	Slough	144,575	34.5	79	0.1118

Data source: ONS^{4,5}, Department for Communities and Local Government⁶

ⁱ Mid-year population estimate, 2014; ⁱⁱ Based on 2011 Census data ⁱⁱⁱ Most of IMD data based on 2012-2013

This is further supported by the breakdown of IMD indicators by Clinical Commissioning Group (CCG). As shown in Table 2, the ranking of CCGs has a similar pattern to unitary authorities, except for South Reading CCG and North and West Reading CCG. Here North and West Reading CCG appears to be one of the least deprived in England with a rank of 198, and only 3% of the population living in the most deprived LSOAs. In contrast, South Reading CCG has a rank of 77 and has 14% of the population living in the most deprived LSOAs.

³ See accompanying notes to English Indices of Deprivation 2015. **File 10: Local authority district summaries.** <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>

⁴ Office for National Statistics (ONS). Population estimates for UK, England and Wales, Scotland and Northern Ireland, Mid-2014 <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-368259>

⁵ Office for National Statistics (ONS). 2011 Census: KS201EW Ethnic group, local authorities in England Wales. <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-286262>

⁶ Department for Communities and Local Government. English Indices of Deprivation 2015. **File 10: Local authority district summaries.** <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>

Table 2 Population and index of multiple deprivation for CCGs in Berkshire

	Clinical Commissioning Group	Population estimate ⁱ	IMD Rank ⁱⁱ (out of 209)	IMD Extent
West	Newbury and District CCG	105,971	191	0.0155
	North and West Reading CCG	100,382	198	0.0292
	South Reading CCG	110,204	77	0.1396
	Wokingham CCG	159,097	209	0
East	Bracknell and Ascot CCG	135,911	200	0.0027
	Windsor, Ascot and Maidenhead CCG	141,312	174	0.0015
	Slough CCG	144,575	68	0.1118

Data source: ONS⁷, Department for Communities and Local Government⁸

ⁱ Mid-year population estimate, 2014

3.2 Number of cases and incidence of TB

Between 2008 and 2014, there were a total of 1191 notifications of TB in Berkshire (Table 3), with an average of 170 per year. This translates to an annual incidence rate ranging between 18.1 and 20.7 per 100,000 people.

Table 3 TB notifications and incidence rate, Berkshire (2008-2014)

	2008	2009	2010	2011	2012	2013	2014
Number of cases	149	161	175	173	171	181	181
Incidence rate (per 100,000)	18.1	18.7	20.2	20.0	19.6	20.5	20.7

Data source: Enhanced Tuberculosis Surveillance (ETS)

The total number of TB cases in Berkshire in 2014 was 181, representing 2.8% of the total case burden for the UK (n= 6,520).

Breakdown of cases by local authority shows that the majority of cases are from Reading and Slough (Table 4), which together accounted for 75% of notifications (n=894). The number of notifications outside of Reading and Slough remain small, with no obvious trends over the past 8 years, except higher number of notifications in 2014 from Windsor and Maidenhead UA and Wokingham UA. However, due to the small numbers, it is difficult to know whether this is a true increase or natural variation.

⁷ Office for National Statistics (ONS). Mid-2014 Population Estimates for Clinical Commissioning Groups (CCGs) in England <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-318167>

⁸ Department for Communities and Local Government. English Indices of Deprivation 2015. **File 13: Clinical Commissioning Group Summaries** <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>

Table 4 TB notifications by local authority, Berkshire (2008-2014)

Year	2008	2009	2010	2011	2012	2013	2014	Total	
West	West Berkshire	5	11	7	6	9	11	7	56
	Reading	58	57	59	52	42	66	63	397
	Wokingham	9	10	16	10	14	12	19	90
East	Bracknell Forest	7	9	12	10	10	6	14	68
	Windsor and Maidenhead	11	12	9	10	12	9	20	83
	Slough	59	62	72	85	84	77	58	497
Total	149	161	175	173	171	181	181	1191	

Data source: Enhanced Tuberculosis Surveillance (ETS)

Graph 1 displays the number of notifications and trends, by local authority. As mentioned, it highlights the high number of notifications from Reading and Slough when compared to surrounding areas. Additionally, it appears that, between 2010 and 2013, the number of cases increased in Slough and decreased in Reading, with the caveat that these remain notification numbers rather than incident rates.

Graph 1 TB notifications by local authority, Berkshire (2008-2014)

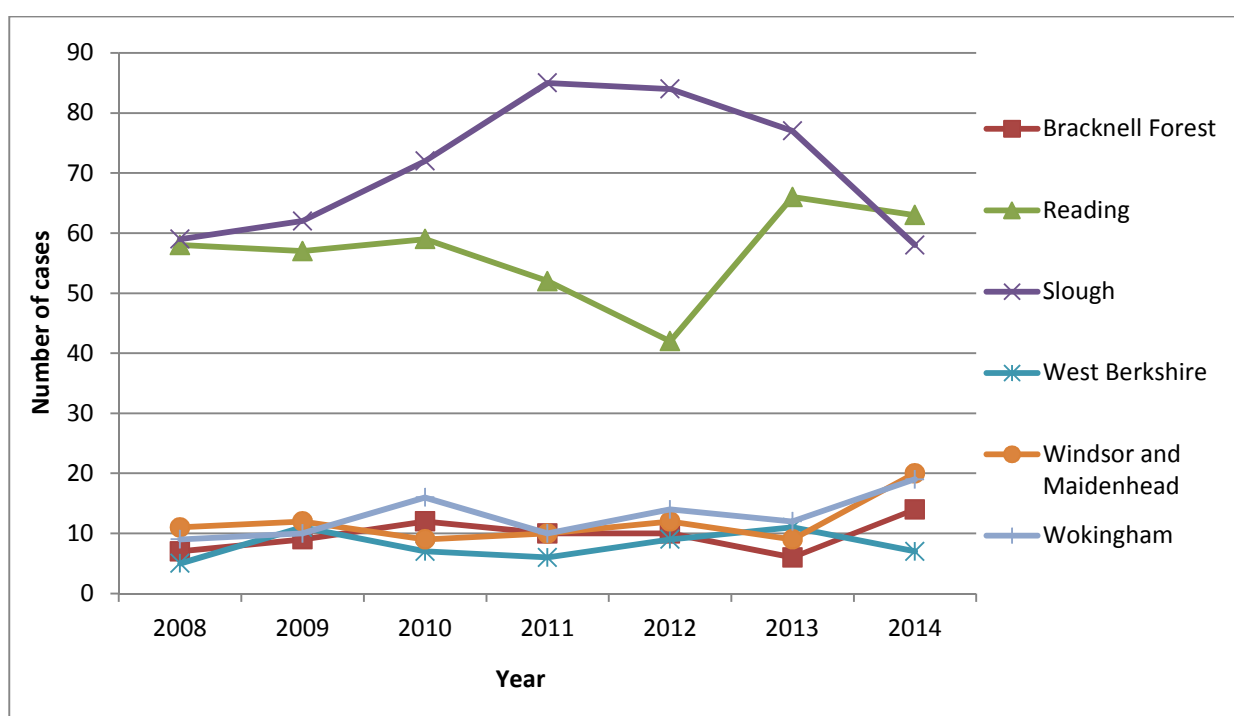


Table 5 and Table 6 display the average incidence rates over three-year periods, with confidence intervals, for 2012-2014 and 2011-2013. Both tables show that Slough and Reading have incidence rates far higher than, and statistically significantly different to, the incidence rate for England and the South East. The incidence rates for the rest of Berkshire (5.8-9.6 per 100,000) are significantly lower than the rest of England. The rate for Slough (51.5, 95% CI 44.9-58.7) is higher than for Reading (36.3, 95% CI 31.1-42.1) and this is statistically significant.

Table 5 Three-year average TB incidence rates (per 100,000) across Berkshire (2012-2014)

	Number of cases	Incidence rate	95%CI
England	21,863	13.5	13.3 – 13.7
South East	2,128	8.3	8.0 – 8.7
Berkshire	533	20.2	18.5 – 22.0
Slough	221	51.5	44.9 – 58.7
Reading	173	36.3	31.1 – 42.1
Windsor and Maidenhead	42	9.6	6.9 – 12.9
Wokingham	45	9.5	6.9 – 12.7
Bracknell Forest	30	8.6	5.8 – 12.2
West Berkshire	28	5.8	3.8 – 8.4

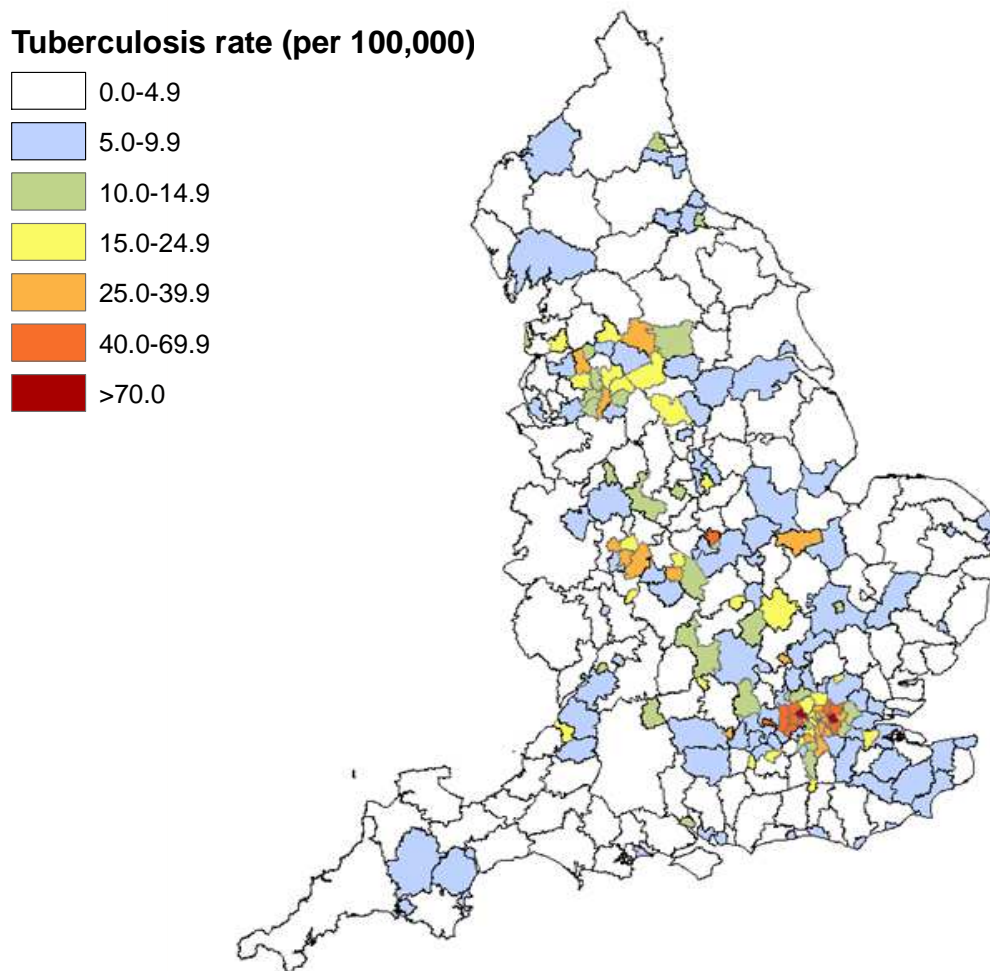
Data source: All data from Fingertips PHE tool (originally ETS and ONS)⁹ except for Berkshire, which has been calculated by the main author using ONS population data and ETS cases

Table 6 Three-year average TB incidence rates (per 100,000) across Berkshire (2011-2013)

	Number of cases	Incidence rate	95%CI
England	23,619	14.7	14.5 – 14.9
South East	2,272	8.9	8.6 – 9.3
Berkshire	524	20.1	19.2 – 22.8
Slough	247	57.8	46.0 – 71.8
Reading	161	33.7	25.3 – 44.1
Windsor and Maidenhead	31	6.9	3.3 – 12.6
Wokingham	36	7.7	4.0 – 13.4
Bracknell Forest	26	7.0	3.0 – 13.7
West Berkshire	26	5.2	2.2 – 10.2

⁹ Accessed via <http://fingertips.phe.org.uk/profile/tb-monitoring/>

Data source: All data from Fingertips PHE tool (originally ETS and ONS)¹⁰ except for Berkshire, which has been calculated by the main author using ONS population data and ETS cases



Map 4 Three-year average TB incidence rates (per 100,000) by local authority district, England (2012-2014)

Data source: Public Health England (Tuberculosis in England: 2015 Report)¹¹

A comparison to nationwide data for all local authorities in England shows that Slough has one of the highest rates outside of London, and that rates in Reading are also comparatively high.

Breakdown by CCG reveals that the majority of cases in Reading were covered by the South Reading CCG area (n=47), with few cases in North and West Reading (n=8). This reveals a similar pattern to the socio-demographic indicators on population, ethnicity and deprivation.

In addition, the difference between South Reading and Slough is less obvious, with the incidence rate in South Reading CCG at 45.8 per 100,000 and in Slough CCG at 51.6 per 100,000. As the confidence intervals overlap, this difference is no longer statistically significant (38.8-53.8 vs 45.1-58.9 in 2012-2014).

¹⁰ Accessed via <http://fingertips.phe.org.uk/profile/tb-monitoring/>

¹¹ Accessed via <https://www.gov.uk/government/publications/tuberculosis-in-england-annual-report>

Table 7 TB incidence (per 100,000) by Clinical Commissioning Group in Berkshire, 2012-2014

	Average annual number of cases	Incidence rate	95% CI	
West	Newbury and District CCG	7	6.9	4.4 – 10.5
	North and West Reading CCG	10	9.7	6.5 – 13.9
	South Reading CCG	50	45.8	38.8 – 53.8
	Wokingham CCG	15	9.5	6.9 – 12.7
East	Bracknell and Ascot CCG	11	8.0	5.4 – 11.2
	Windsor, Ascot and Maidenhead CCG	14	9.8	7.0 – 13.3
	Slough CCG	74	51.6	45.1 – 58.9

Table 8 TB incidence (per 100,000) by Clinical Commissioning Group in Berkshire, 2011-2013

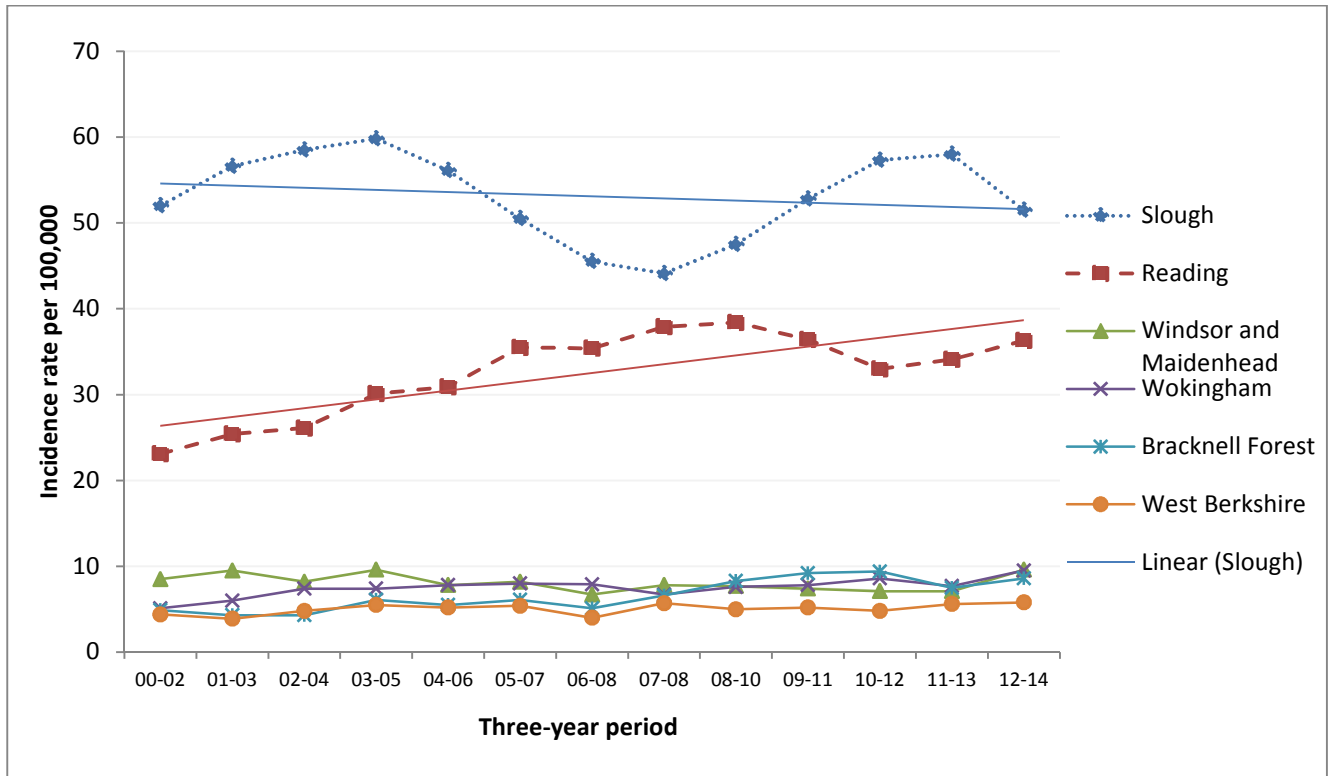
	Average annual number of cases	Incidence rate	95% CI	
West	Newbury and District CCG	7	6.7	2.7 – 13.7
	North and West Reading CCG	8	8.0	3.5 – 15.8
	South Reading CCG	47	43.8	32.2 – 58.3
	Wokingham CCG	12	7.7	4.0 – 13.4
East	Bracknell and Ascot CCG	9	6.8	3.1 – 12.8
	Windsor, Ascot and Maidenhead CCG	10	7.2	3.5 – 13.2
	Slough CCG	83	58.5	46.6 – 72.5

Table 9 and Graph 2 show the three-year average incidence rates by local authority from 2000 to 2014. The most pertinent findings are that the incidence rates in Slough appear to have remained constant, or decreased slightly over the past 14 years. Conversely, the rates in Reading show an obvious increase over the same period. Wokingham and Bracknell Forest appear to have an increase in rates, though they remain low compared to the rest of England.

Table 9 TB three-year average incidence rates (per 100,000) by local authority, Berkshire (2000-2014)

	00-02	01-03	02-04	03-05	04-06	05-07	06-08	07-09	08-10	09-11	10-12	11-13	12-14
Slough	52.0	56.6	58.5	59.8	56.1	50.5	45.5	44.1	47.5	52.8	57.3	58.0	51.5
Reading	23.1	25.4	26.1	30.1	30.9	35.5	35.4	37.9	38.4	36.4	33.0	34.1	36.3
Windsor and Maidenhead	8.5	9.5	8.2	9.6	7.8	8.2	6.7	7.8	7.7	7.4	7.1	7.1	9.6
Wokingham	5.1	6.0	7.4	7.4	7.8	8.0	7.9	6.7	7.6	7.8	8.6	7.7	9.5
Bracknell Forest	4.9	4.3	4.3	6.1	5.5	6.1	5.1	6.6	8.3	9.2	9.4	7.5	8.6
West Berkshire	4.4	3.9	4.8	5.5	5.2	5.4	4.0	5.7	5.0	5.2	4.8	5.6	5.8

Graph 2 TB three-year average incidence rates (per 100,000) by local authority, Berkshire (2000-2014)



Breakdown by wards in each local authority (Map 5), shows that the incidence rates for TB are highest in wards clustered around urban areas, particularly in Reading and Slough. One ward in Bracknell Forest appears to have experienced an increase in incidence since 2012.

Reading appears to have the ward with the highest incidence rate in Berkshire (Table 10), with incidence rate ranging from 83.6 to 121.0 for each of the three-year periods from 2005 to 2014. Slough has high incidence rates throughout most of its wards, with six wards with an average rate above 60 per 100,000.

Map 5 TB three-year average incidence rates (per 100,000) by ward, Berkshire (2012-2014)

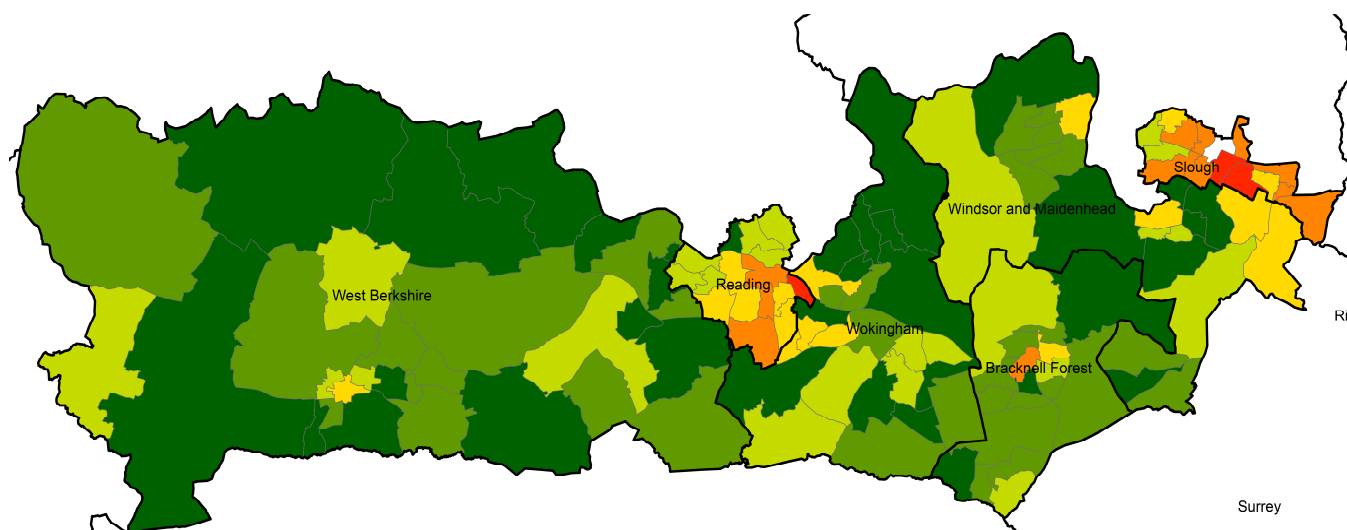


Table 10 TB three-year average incidence rates by ward, for wards with 2012-2014 average incidence rate > 40 per 100,000, Berkshire (2005-2014)

Local Authority	Ward	Three-Year Average Incidence rate							
		2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14
Bracknell	Wildridings and Central	0.0	0.0	0.0	0.0	0.0	<40	<40	40-60
Reading	Park	80-100	80-100	100-120	100-120	100-120	80-100	80-100	>120
	Katesgrove	40-60	40-60	60-80	60-80	60-80	40-60	40-60	60-80
	Whitley	<40	<40	<40	<40	<40	<40	40-60	40-60
	Abbey	100-120	80-100	80-100	60-80	60-80	60-80	60-80	40-60
Slough	Central	80-100	80-100	60-80	60-80	60-80	80-100	80-100	80-100
	Upton	60-80	80-100	80-100	60-80	40-60	60-80	80-100	80-100
	Foxborough	<40	<40	<40	<40	<40	<40	40-60	60-80
	Wexham Lea	60-80	60-80	60-80	60-80	60-80	60-80	80-100	60-80
	Baylis and Stoke	100-120	80-100	60-80	60-80	80-100	80-100	80-100	60-80
	Chalvey	100-120	60-80	80-100	80-100	80-100	80-100	60-80	60-80
	Farnham	60-80	40-60	40-60	40-60	60-80	80-100	60-80	40-60
	Colnbrook with Poyle	<40	<40	40-60	60-80	60-80	40-60	40-60	40-60
	Langley St Mary's	<40	<40	<40	40-60	40-60	40-60	40-60	40-60
	Cippenham Meadows	<40	40-60	40-60	<40	40-60	40-60	40-60	40-60

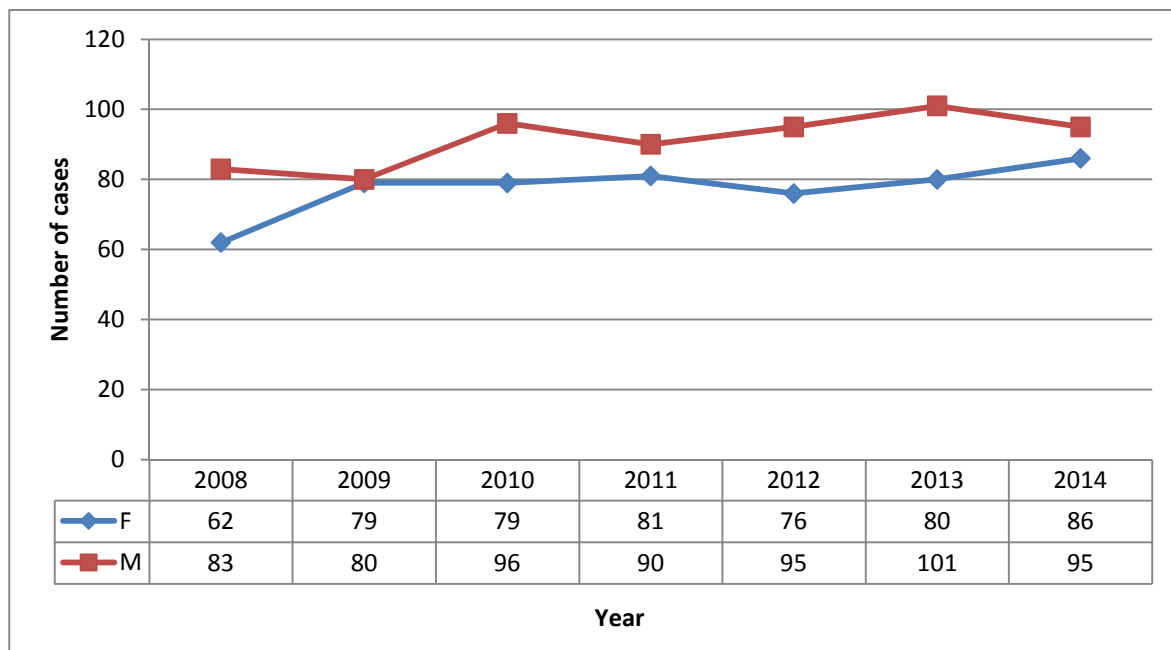
3.3 Age and gender distribution

An overview of the gender distribution of cases shows that the majority of cases (54%) are male (640/1183), and this has been consistent during the past seven years (Graph 3). This is similar to data for the rest of England, which shows that the majority of cases (58.8%) were male.¹²

¹² Public Health England. 2015. Tuberculosis in England: 2015 Report (presenting data to end of 2014) <https://www.gov.uk/government/publications/tuberculosis-in-england-annual-report>

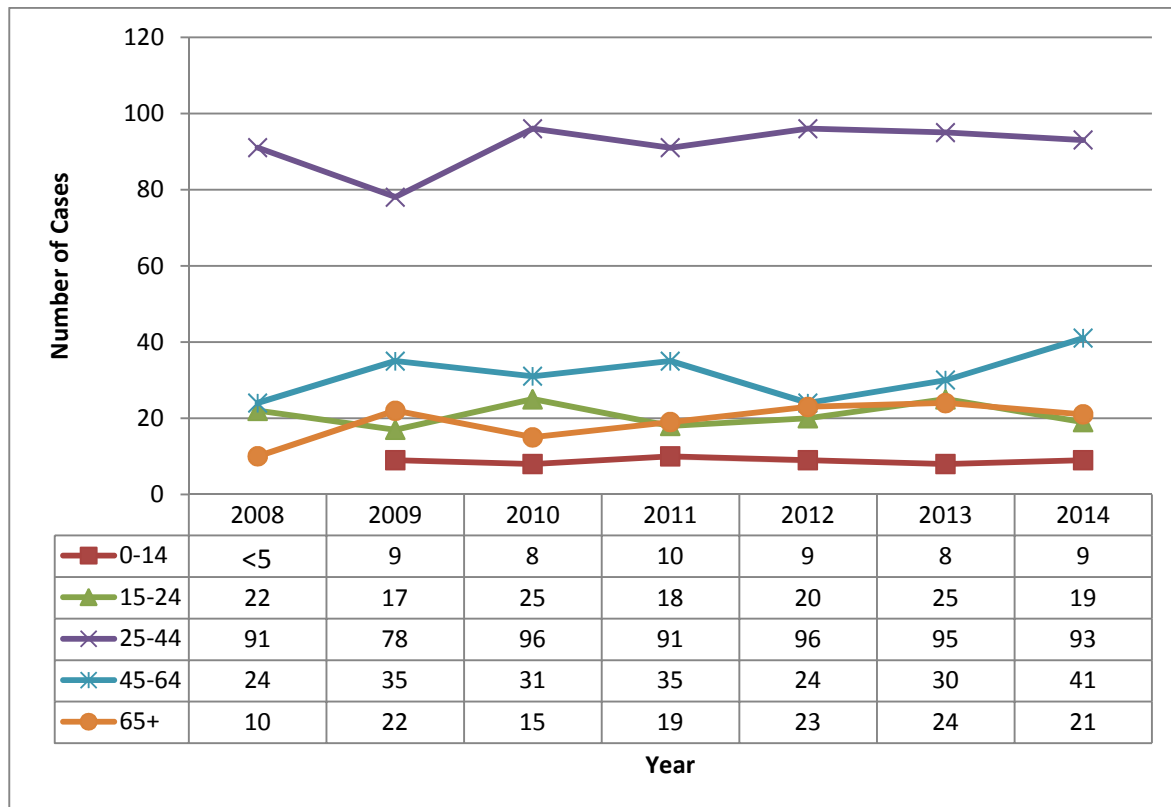
The majority of cases were in the 25-44 category (53%), and this is similar to national data (57% in 15-44 category), and does not appear to have changed over the time period. Fewer than 10 cases each year are in the 0-14 category.

Graph 3 TB case reports by gender, Berkshire (2008-2014)



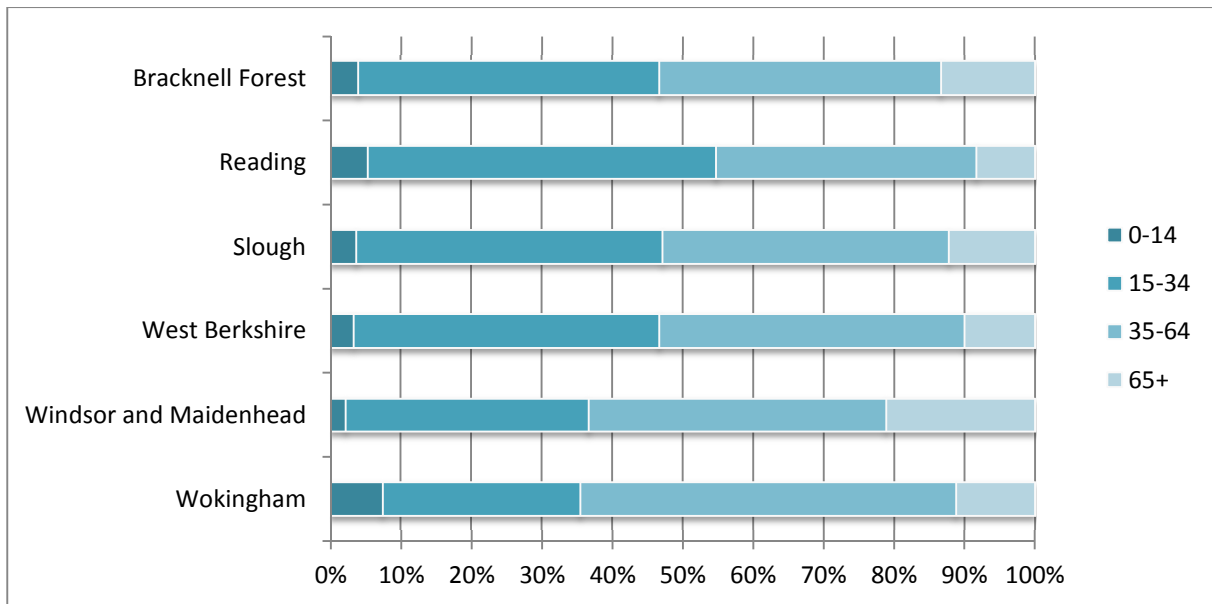
Data source: Enhanced Tuberculosis Surveillance; Note: total number of cases included is 1183 – missing data for 8 cases.

Graph 4 TB case reports by age group, Berkshire (2008-2014)



Data source: Enhanced Tuberculosis Surveillance;

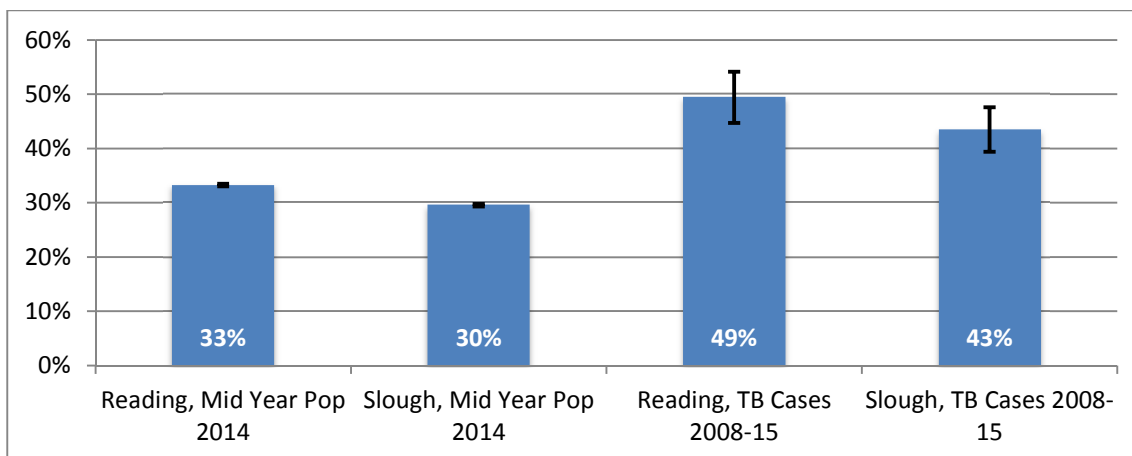
Graph 5 Proportion of TB cases by age group and local authority, Berkshire, 2008-2015* data



Breakdown of age distribution by local authority shows that there is some variation between the areas. Reading has the greatest proportion of cases aged 15-34, Wokingham has the greatest proportion of cases aged 35-64 and Windsor and Maidenhead has the greatest proportion aged 65 and over. The age distribution of TB cases in Reading suggests a younger range affected by TB, than those in Slough. Outside of Reading and Slough, the results should be interpreted with caution due to the small number of cases.

A disproportionate volume of cases are aged 15-34 years compared to the population as a whole. Graph 6 compares the proportion of the Reading and Slough populations aged 15-34 years (based on Office of National Statistics population projections for 2014) against the proportion of this age group observed within all TB cases in the years 2008-2015. The difference in these proportions appears to be significant, indicating that the TB case cohort may tend to be younger than the general population.

Graph 6: Proportion of Reading and Slough populations aged 15-34 years, comparison between population projections and reported TB cases (95% confidence intervals displayed)



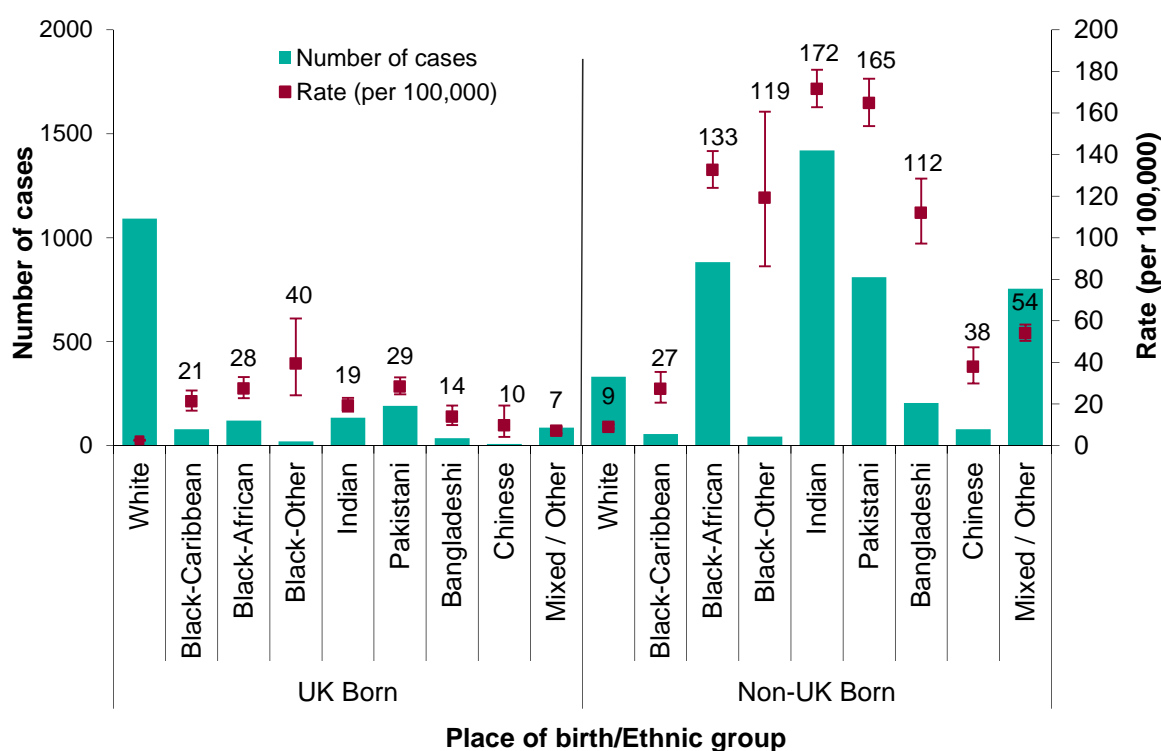
3.4 Ethnicity and place of birth

The greatest number of cases in England (2014) were in the Indian, non-UK born population (n=1,419). This group also exhibited the highest rate (171.6 per 100,000), followed by the Pakistani, non-UK born population (164.8 per 100,000). Conversely, the highest number of cases in the UK-born population was in the White population (n=1,091), though this represented an incidence rate of only 2.6 per 100,000.

In Berkshire, of the 1327 cases (2008-2015),¹³ there were 224 UK born (16.9%) and 1095 non-UK born (82.5%) cases (data not shown). There were 8 cases where the place of birth was unknown (0.6%).

Similar to the data for England, the highest number of cases for Berkshire were in the Indian non-UK born population (n=388), which represented 39% of the total number of cases in people who were not born in the UK and 33% of all cases in Berkshire (see Table 11). In the UK-born population, the highest number of cases was in the White population (87, 45% of UK born cases). In addition, there are a high number of cases amongst the Black-African non-UK born, Pakistan non-UK born and Mixed/Other non-UK born populations. This pattern is broadly similar to the data for England.

Graph 7 TB case notifications and rates by place of birth and ethnic group, England, 2014



Source: Public Health England¹⁴

¹³ Not all cases for 2015 had been reported at time of writing, but those available have been included

¹⁴ Enhanced Tuberculosis Surveillance (ETS), Labour Force Survey (LFS), Data extracted: March 2015. Prepared by: TB Section, National Infection Service, Public Health England
<https://www.gov.uk/government/publications/tuberculosis-in-england-annual-report>

Table 11 TB case reports and rates by place of birth and ethnic group, Berkshire, 2008-2014, with indirect standardisation

Place of birth	Ethnic group	Number of cases 2008-2014 ⁱ	Berkshire population ⁱⁱ	Local Rate per 100,000 ⁱ ⁱⁱ	National Rate per 100,000, 2014	Standardised incidence ratio ^{iv}
UK born	White	87	616,327	2	3	78
	Black-Caribbean	5	4,870	15	21	69
	Black-African	9	4,903	26	28	95
	Black-Other	<5	2,083	7	40	17
	Indian	36	18,073	28	19	147
	Pakistani	46	21,448	31	29	108
	Bangladeshi	0	1,068	0	14	0
	Chinese	<5	1,475	10	10	99
	Mixed / Other ^v	10	20,333	7	7	98
Non-UK born	White	39	73,551	8	9	83
	Black-Caribbean	9	3,606	36	27	131
	Black-African	140	13,261	151	133	114
	Black-Other	<5	1,245	34	119	29
	Indian	388	25,218	220	172	128
	Pakistani	236	18,482	182	165	111
	Bangladeshi	7	1,150	87	112	78
	Chinese	10	4,414	32	38	85
	Mixed / Other ^v	152	10,075	216	54	398

ⁱ Cases data is for 2008-2014 ⁱⁱ Berkshire population data based on 2011 Census ⁱⁱⁱ Local rate is calculated by averaging number of cases for 2008-2014 and dividing by 2011 population data ^{iv} Standardised incidence ratio has been calculated by dividing the average annual number of cases by the expected number of cases (based on multiplying the national rate for 2014 by the local population) ^v Includes "Other Asian" in this category

Table 11 shows the local rates for Berkshire and the standardised incidence ratio. It shows that for most ethnic groups, the incidence rates in Berkshire are similar to or lower than would be expected from the national rate. For example, in the Indian non-UK born population, the local number of cases is the same as the expected number of cases. In the Pakistani non-UK born, the Black African non-UK born and the White UK born population, the rates are 11 to 36% lower than national rates. For the "Mixed/Other" non-UK born population, the rate is 353% higher than expected. All other rates should be interpreted with caution, due to the small number of cases after breakdown by place of birth and ethnicity.

Table 12 gives a breakdown of TB cases by country of birth and this shows that the most frequently reported countries in Berkshire are India, Pakistan, UK, Nepal and Kenya, which together were responsible for 76.6% of cases. Conversely, for England, the most frequently reported countries were UK, India, Pakistan, Somalia and Bangladesh. The high number of cases in the Nepalese population in Berkshire, may explain why the standardised incidence ratio in the "Mixed/Other" non-UK born population is much higher than expected.

Table 12 Most frequent countries of birth for TB cases in Berkshire (2008-2015) vs TB cases in England (2014)

Berkshire (2008-2015)				England (2014 only)		
Place of birth	n	%		Place of birth	n	%
India	416	31.2		UK	1,774	28.2
Pakistan	247	18.6		India	1,228	20.5
UK	224	16.8		Pakistan	791	12.6
Nepal	97	7.3		Somalia	230	3.7
Kenya	36	2.7		Bangladesh	207	3.3
Zimbabwe	30	2.3		Nepal	168	2.7
Somalia	25	1.9		Nigeria	118	1.9
Philippines	24	1.8		Philippines	111	1.8
South Africa	20	1.5		Zimbabwe	107	1.7
Hong Kong	17	1.3		Afghanistan	96	1.5

Table 13 shows further breakdown by local authority in Berkshire. For most of the authorities, the most frequently reported countries of birth are India, UK and Pakistan. In Reading and Bracknell, the numbers reported from Nepal are a notable exception to this pattern. This is likely to reflect migration patterns into those areas and the local communities. Only ten cases in people born in Nepal have been reported outside of Reading and Bracknell since 2008. Six of these were in Slough, where Nepal is the tenth most common country of birth, but represents only 1% of cases.

Table 13 Top 3 countries of birth for TB cases, by local authority, 2008-2015*

West Berks	Reading	Wokingham	Bracknell	Windsor and Maidenhead	Slough
India (17, 28%)	India (105, 24%)	India (42, 39%)	UK (16, 21%)	India (36, 40%)	India (199, 35%)
UK (13, 22%)	Nepal (73, 17%)	UK (33, 31%)	India (15, 20%)	UK (24, 27%)	Pakistan (155, 27%)
All others 5 or less	UK (67, 15%)	Pakistan (13, 12%)	Nepal (14, 19%)	Pakistan (7, 8%)	UK (71, 13%)

Data source: Enhanced Tuberculosis Surveillance (ETS)

3.4.1 Time since entry to the UK

For the 1095 non-UK born cases, the time of entry into the UK was known for 1089 cases (99.5%). As shown in Table 14, the majority of cases in Berkshire were detected after 2 or more years in the UK. This is similar to data for England, except the data for England shows that the greatest number of cases were detected after more than 11 years in the UK.

Table 14 Time between entry to the UK and TB notification for non-UK born cases in Berkshire, with comparison to England

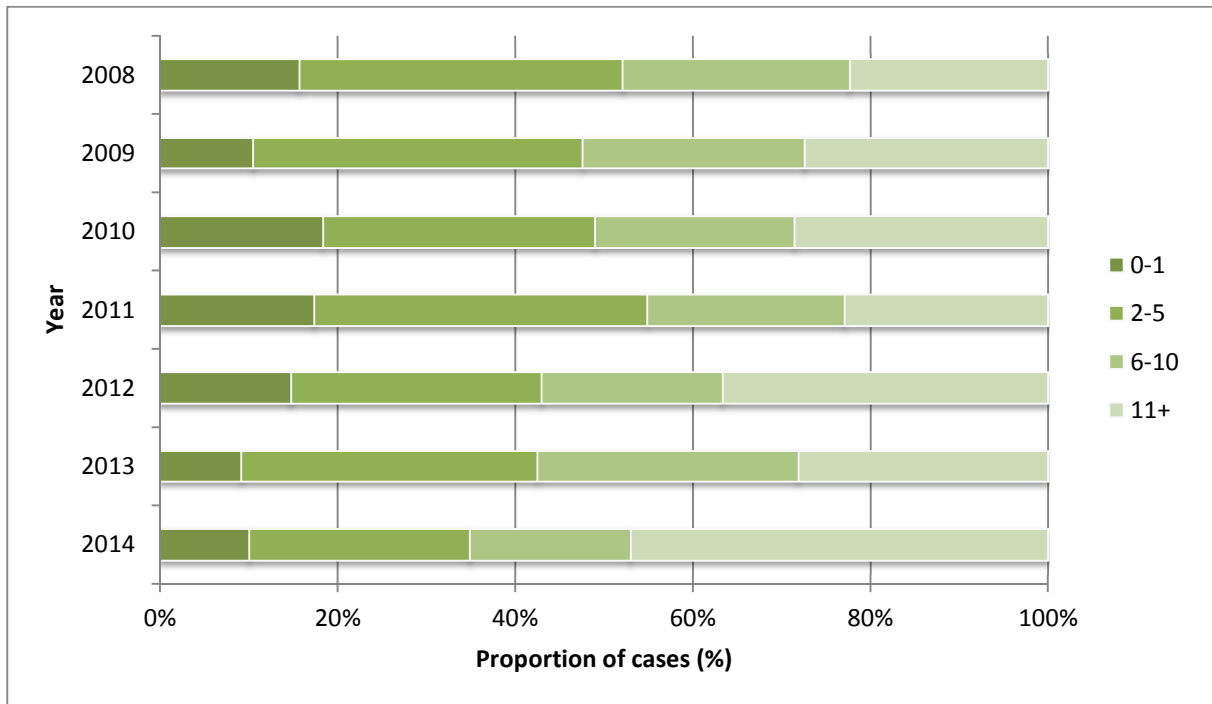
Years since entry	0-1		2-5		6-10		11+		Total
	n	%	n	%	n	%	n	%	
Berkshire (2008-2015*)	145	13.3	339	31.1	262	24.1	343	31.5	1089
England (2014 only)	591	14.0	1083	25.7	886	21.0	1656	39.3	4216

Data source: ETS data for Berkshire and PHE Report; Note that data for 2015 is not yet complete

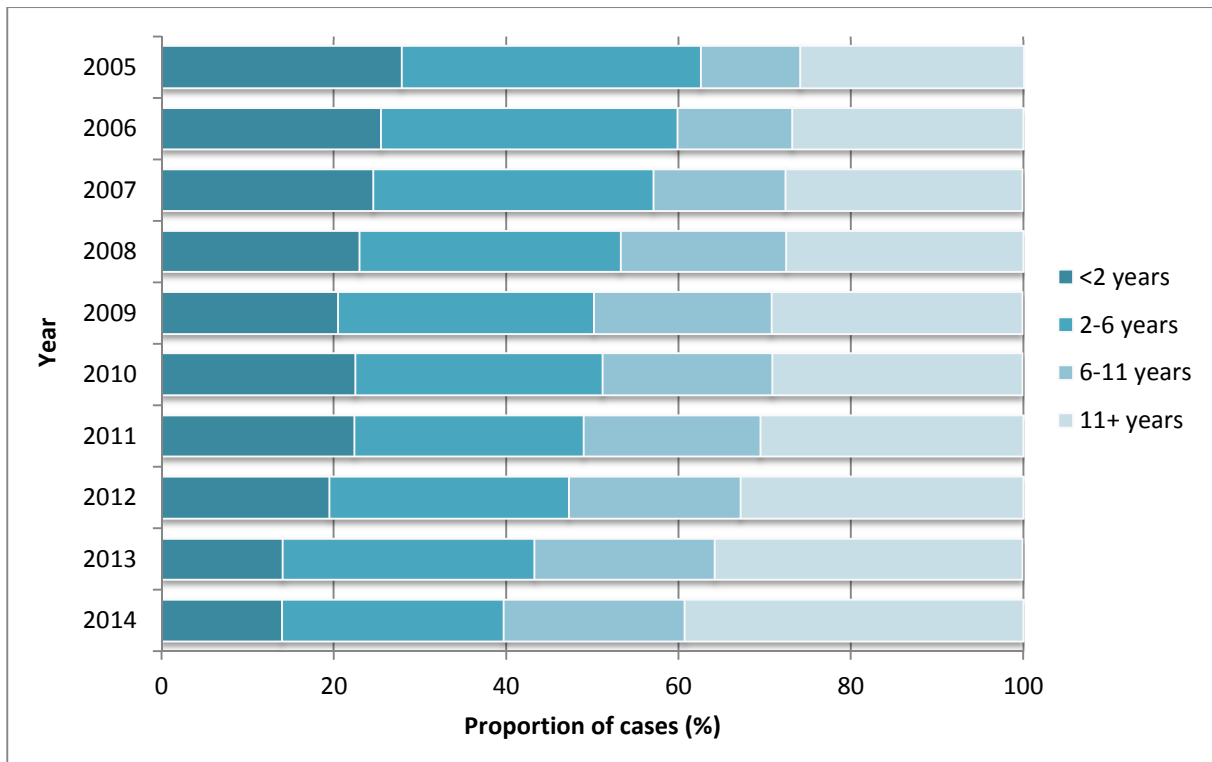
Though based on small numbers, there is a suggestion (Graph 8) that the time between entry to the UK and TB notification has been increasing over time. In particular, the number diagnosed more than

11 years after entry appears to be increasing. This trend is more obvious in the data for England (Graph 9).

Graph 8 Time between entry to the UK and TB notification for non-UK born cases by year, Berkshire, 2008-2014



Graph 9 Time between entry to the UK and TB notification for non-UK born cases by year, England, 2005-2014



3.5 Occupation and risk factors

Of the 1117 TB cases aged 16-64 in Berkshire, the occupation was known for 1077 (96.4%). Of those with known occupation, 25.3% were not in education or employment in Berkshire, compared to

34.1% in England. The remainder were either studying or working in education (8.4% in Berkshire, 11.8% in England), working in healthcare (7.5% in Berkshire, 6.9% in England) or classed as working in other occupations (58.7% in Berkshire, 47.2% in England).

Table 15 TB cases by occupation for Berkshire (2008-2015)* and England (2014)†

Occupation	TB cases			
	Berkshire		England	
	n	%	n	%
None	272	25.3	1,639	34.1
Education	91	8.4	566	11.8
Health care worker	81	7.5	331	6.9
Other	633	58.7	2,267	47.2

*Includes data for 1077 TB cases with known occupation in Berkshire, 2008-2015, aged between 16-64; †Includes data for 4803 TB cases with known occupation (92.2%, n= 5,207) for England, 2014, aged between 16-64

Table 16 shows the data on the presence of four social risk factors associated with TB: drug misuse, alcohol misuse, homelessness and imprisonment. In Berkshire, for each of the risk factors, around 0.7 – 1.3% of cases were affected. Though not tested for statistical significance, this appears to be much lower than the data for England which showed that for each of the risk factors, around 3.3-3.4% are affected. The national data shows that the proportion of UK-born cases with at least one social risk factor (15%) was more than double that of the non-UK born population (7%).

Table 16 Number and proportion of TB cases with a social risk factor (2008-2015)* and England (2014)

Social risk factor	TB cases			
	Berkshire		England	
	n	%	n	%
Drug misuse	9	0.7	201	3.3
Alcohol misuse	14	1.1	198	3.3
Homelessness	14	1.1	206	3.4
Prison	17	1.4	192	3.3

*Includes data for 1334 TB cases in Berkshire, 2008-2015

3.5.1 Underserved and High-Risk Populations

Tuberculosis disproportionately affects those individuals from deprived and marginalised backgrounds, groups which have reduced levels of access to social support such as housing.¹⁵ These groups tend to fall under one or more of the following categories:

- Homeless people (including those in insecure, poor or temporary housing)
- Prisoners
- People who misuse substances
- Vulnerable migrants (e.g. refugees, asylum seekers etc.)

Specific issues which can affect these populations include complexities around funding of treatment, immigration concerns and legal issues. A co-ordinated approach is required to ensure commissioning of both clinical and community support services is effective for those undergoing treatment. NICE has released guidance documents covering tuberculosis in vulnerable groups (LGB11) and its

¹⁵ Potter et al. 2015. Support of vulnerable patients throughout TB treatment in the UK. J Public Health. Available from: <http://jpubhealth.oxfordjournals.org/content/early/2015/04/17/pubmed.fdv052.full>

identification and management in under-served groups (PH37).^{16, 17} These highlight the benefits of tackling tuberculosis transmission in these groups, in order to reduce disease burden, narrow health inequalities and build local partnerships.

3.6 Clinical characteristics of TB

The majority of TB cases in Berkshire had pulmonary disease (59.5%), but with sizeable proportions presenting with extrathoracic or intrathoracic lymph nodes (29.5 and 15.9%). This is broadly similar to data for England, where 52.9, 22.3 and 13.3% presented with pulmonary disease, extrathoracic and intrathoracic lymph nodes, respectively.

Table 17 TB notifications by site of disease, Berkshire (2008-2015*) and England (2014)

Site of disease	TB notifications			
	Berkshire		England	
	n	%	n	%
Pulmonary	539	59.5	3,434	52.3
Extrathoracic lymph nodes	394	29.5	1,445	22.3
Intrathoracic lymph nodes	212	15.9	863	13.3
Pleural	135	10.1	566	8.7
Gastrointestinal	75	5.6	368	5.7
Bone – spine	54	4.1	310	4.8
Miliary	43	3.2	179	2.8
CNS – meningitis	34	2.6	148	2.3
Bone – other	27	2.0	168	2.6
Genitourinary tract	25	1.9	129	2.0

Data source: Public Health England. 2015. Tuberculosis in England: 2015 Report (presenting data to end of 2014)
<https://www.gov.uk/government/publications/tuberculosis-in-england-annual-report>

¹⁶ NICE. 2013. *Tuberculosis in vulnerable groups*. Available from <https://www.nice.org.uk/advice/lgb11/chapter/introduction>

¹⁷ NICE. 2016. *Tuberculosis*. Available from: <https://www.nice.org.uk/guidance/ng33>

4 Service provision

This section considers the current TB service provision and performance in Berkshire. In contrast to the previous section, this section considers cases by service they have accessed (rather than local authority), and this may include service users who live outside of Berkshire and the Thames Valley. The main sources of data are the Enhanced Tuberculosis Surveillance (ETS) dataset, covering 2011-2014, and information obtained from interviews with service providers (see Service-User Questionnaire).

4.1 Current service provision

Tuberculosis (TB) services for Berkshire are delivered by two main providers:

1. The **Berkshire West TB service**, run by Royal Berkshire NHS Foundation Trust offers services primarily to patients residing in Reading, Wokingham and West Berkshire (see Table 18). The service is based in Royal Berkshire Hospital (Reading), from 8am to 4pm on weekdays, with some ad-hoc clinics run in West Berkshire Community Hospital (Newbury).
2. The **Berkshire East TB service**, run by Frimley Health NHS Foundation Trust¹⁸ offers services primarily to patients residing in Slough, Windsor and Maidenhead and Bracknell Forest (see Table 18). The service is based in King Edward VII Hospital (Windsor), runs from 8am to 5pm on weekdays, and offers in-patient consultations for patients at Wexham Park Hospital (Slough).

Table 18 TB cases notified by TB services in Berkshire, by local authority, 2011-2014¹⁹

TB Service, and local authority	2011	2012	2013	2014
Berkshire West TB service	71	67	91	92
West Berkshire	6	8	11	6
Reading	51	41	64	62
Wokingham	10	12	11	18
Bracknell Forest	<5	<5	<5	<5
Windsor and Maidenhead	-	-	<5	-
Slough	-	-	-	-
South Buckinghamshire	-	<5	-	-
Unknown	-	<5	-	<5
Out-of-area	-	-	<5	<5
Berkshire East TB service	99	103	81	95
West Berkshire	-	-	-	-
Reading	-	-	-	-
Wokingham	-	<5	<5	-
Bracknell Forest	<5	<5	<5	10
Windsor and Maidenhead	9	12	6	17
Slough	80	80	71	53
South Buckinghamshire	<5	6	<5	6
Wycombe	<5	-	-	<5
Unknown	<5	-	-	<5

¹⁸ Note: Frimley Health NHS Foundation Trust provides services across administrative boundaries, including Surrey, Hampshire, Berkshire and south Buckinghamshire via three hospitals: Frimley Park Hospital, Wexham Park Hospital and Heatherwood Hospital. Frimley Park Hospital offers a separate TB service.

¹⁹ Public Health England. 2015. Tuberculosis in South East Centre: Annual Review (2014 data)

Both areas offer a TB nurse-led service, which includes:

- Diagnosing and treating TB cases, including enhanced case management and/or directly observed therapy (DOT)
- Tracing and managing contacts of TB cases and managing latent TB
- BCG vaccination clinics
- Screening for latent TB infection (LTBI) to new entrants into the UK
- Reviewing hospitalised patients
- Raising awareness with colleagues
- Liaising with other specialties
- Providing screening/BCG assessment for occupational groups on a private basis

Both services accept self-referrals and referrals from other professionals and organisations (GPs, hospital clinicians, Public Health England and other TB services). According to the service providers, in Berkshire East the majority arrive on an open access basis, whereas in Berkshire West the majority are referrals.

Royal Berkshire Hospital (RBH) and Wexham Park Hospital (WPH) do not have negative pressure rooms, therefore both services refer any multi-drug-resistant tuberculosis (MDR-TB) cases to the Churchill Hospital in Oxford.

There are no prisons or immigration and removal centres in Berkshire, and few cases relate to drug misuse, alcohol misuse, homelessness or imprisonment. As shown in Section 1, the most common risk factors are ethnicity and being born outside of the UK. Both TB services use telephone (Language Line) and face-to-face interpretation when needed, as well as providing leaflets in a variety of languages, including in Nepali in Berkshire West. In Berkshire East, the TB nursing team speak Punjabi, Urdu, Hindi and Polish, which covers a large proportion of their service users.

4.1.1 Workforce

The workforce covering each service includes 3 nurses, with support from a respiratory consultant (lead for TB) when required. However, in the Berkshire East TB service, the nurses work full-time on TB as 3.0 whole-time equivalent (WTE; two Band 7 and one Band 8), while in Berkshire West, it equates to approximately 1.9 WTE (one Band 6, one Band 7 and one Band 8).

Over the past four years (2011-2014), the Berkshire West TB service has managed an average of 80 cases per year (range 67-92), while the Berkshire East TB service has managed an average of 95 cases per year (range 81-103). When taken into account with the WTE, this equates to average staffing levels of 1:42 for Berkshire West and 1:32 for Berkshire East (2011-2014). The Royal College of Nursing (RCN) recommends one TB nurse per 40 cases requiring standard management and one per 20 cases requiring enhanced case management.²⁰ Though this seems reasonable, the capacity of services in Berkshire West may be stretched more than the figures suggest, as the Band 6 nurse covers the New Entrant Screening Service (NESS) predominately, and the Band 8 nurse manages the Consultant Nurse Specialist (CNS) service. In addition to this, the NESS service in West Berkshire is

²⁰ Royal College of Nursing (RCN) 2012. Tuberculosis case management and cohort review: Guidance for health professionals. Royal College of Nursing: London.

currently believed to be under-prescribed due to issues surrounding reduced referrals to the service (see 4.1.4 Gaps in service provision). Increases in the volume of referrals as this issue is addressed could generate additional strain on the service. On the other hand, Berkshire East has a separate NESS, based in Upton Hospital (Slough), with a full-time Band 7 nurse and administrative support. This is of concern, given the increasing incidence rates in Reading (see Table 9, p.16)

Table 19 Comparison of nursing staff and case notifications across TB services in Berkshire, 2011-2014

	TB nurse specialists (WTE), 2014	Total TB cases, 2014	Average cases per year, 2011-2014	Nurses to notifications ratio, 2011-2014
Berkshire West	1.9*	92	80.3	1:42
Berkshire East	3.0	95	94.5	1:32

*Based on one Band 6 working 0.6 WTE, Band 7 at 0.8 WTE and Band 8 at approximately 0.5 WTE spent on the TB service

The majority of Berkshire residents with TB (92.7%) use TB services in Berkshire West and Berkshire East (see Table 20). A minority will attend services in Frimley Park Hospital (2.1%), mainly residents in Bracknell Forest unitary authority.

Table 20 Main hospital for accessing TB services, for residents in Berkshire, 2008-2015*

Hospital		
Royal Berkshire Hospital, Reading	595	44.6
King Edward VII Hospital, Windsor	468	35.1
Wexham Park Hospital, Slough	174	13.0
Frimley Park Hospital, Frimley	28	2.1
Other or unknown	69	5.2
Total	1334	100

4.1.2 BCG vaccination

There have been various policies regarding BCG vaccination for new-borns in Berkshire over the past few years, partly in relation to national shortage of the vaccine since April 2015.²¹

Before the shortage, the policy across Berkshire was as below:

West Berkshire:

- to vaccinate infants (aged 0 to 28 days) with a parent or grandparent who was born in a country where the annual incidence of TB is 40/100,000 or greater **and** any infants from five postcodes with high incidence of TB
- a CQUIN²² payment was available locally, for maintaining uptake rates above 90% in the eligible cohort, and to monitor rates and cleanse the data
- vaccinations were primarily administered by maternity services at birth, at Royal Berkshire Hospital, and with some administered by community services

East Berkshire:

²¹ Public Health England. 2015. *Vaccine Update: Issue 227, March 2015.*

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/418490/PHE_9284_VU_227_Mar2015_special_04.pdf

²² Commissioning for Quality and Innovation (CQUIN)

- to vaccinate infants (aged 0 to 28 days) with a parent or grandparent who was born in a country where the annual incidence of TB is 40/100,000 or greater
- no CQUIN payment, and no reporting or monitoring system in place
- vaccinations administered by maternity services at Heatherwood and Wexham Park Hospitals , and by community services
- new-borns born to mothers living in Berkshire, but delivered in Frimley Park are referred to the community service as maternity services in Frimley Park do not offer BCG

During the shortage, the national policy advised prioritising the categories (below) above other indications for BCG (such as children under 16 years of age, contacts of TB cases and occupational reasons):

- all infants (aged 0 to 12 months) living in areas of the UK where the annual incidence of TB is 40/100,000 or greater
- all infants (aged 0 to 12 months) with a parent or grandparent who was born in a country where the annual incidence of TB is 40/100,000 or greater

All TB and maternity services were advised to keep a record of high risk infants for any subsequent catch up programme.

Since September 2015, the BCG vaccine has been available²³ and a catch-up programme was commissioned by NHS England-South to run from November 2015 to February 2016. This included immunisations for 440 infants in Berkshire West (77.1%) and 378 infants in Berkshire East (85.7%).

The proposed local Berkshire policy²⁴ has aligned universal and targeted BCG vaccination across Berkshire. Based on incidence data for 2012-2014, the new policy recommends universal BCG vaccination for any wards (rather than postcodes) with incidence over 40 per 100,000. However, due to the overall high incidence levels within Slough (where 10 out of 14 wards have incidence levels greater than 40 per 100,000), a pragmatic decision has been made by local screening and immunisation service commissioners that all wards will be eligible to receive BCG vaccination. Ward BCG eligibility for Slough and Reading is listed in Table 21.

²³ Public Health England. 2015. *Vaccine Update: Issue 233, September 2015*.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/461653/PHE_9494_VU_233_Sept_2015_special_BGC_11_web.pdf

²⁴ As at April 2016

Table 21 Wards within Reading and Slough with BCG Eligibility

Local Authority	Ward	Incidence Category (per 100,000)	2012-14 Incidence (per 100,000)	BCG Eligible
Reading	Park	>40	121.0	✓
	Katesgrove	>40	60.7	✓
	Whitley	>40	56.7	✓
	Abbey	>40	51.5	✓
	Redlands		36.1	✗
	Battle		32.7	✗
	Southcote		30.8	✗
	Minster		26.2	✗
	Church		23.6	✗
	Norcot		19.5	✗
	Caversham		17.4	✗
	Kentwood		17.2	✗
	Tilehurst		10.9	✗
	Peppard		10.5	✗
	Thames		10.3	✗
Mapledurham		0.0	✗	
Slough	Central	>40	87.9	✓
	Upton	>40	80.7	✓
	Foxborough	>40	70.2	✓
	Wexham Lea	>40	68.5	✓
	Baylis and Stoke	>40	65.8	✓
	Chalvey	>40	61.5	✓
	Farnham	>40	59.7	✓
	Colnbrook with Poyle	>40	53.3	✓
	Langley St Mary's	>40	45.4	✓
	Cippenham Meadows	>40	41.6	✓
	Kedermister		24.2	✓
	Britwell		21.5	✓
	Cippenham Green		13.8	✓
	Haymill		12.8	✓

Outside of these wards, any infants with parents or grandparents born in a country with incidence over 40 per 100,000 are to be offered BCG vaccination.

4.1.3 Local Initiatives Targeting Under-Served or High Risk Groups

Both services within Berkshire provide different interventions targeted at specific under-served and high-risk populations in their areas.

4.1.3.1 West Berkshire

New-entrant screening is provided via community venues on an ad-hoc basis. Due to there no longer being a detention centre within Reading, refugees and asylum seekers tend to be identified when they present via A&E. The homeless population are generally only screened in relation to contact tracing operations; however proactive work is performed amongst this group in the form of awareness-raising and offers of screening. Uptake of screening amongst the homeless population tends to be low and is potentially restricted by the lack of a mobile x-ray screening unit for identification of active pulmonary tuberculosis.

4.1.3.2 East Berkshire

East Berkshire provides annual screening events with three local charity groups (Slough Homeless Our Concern, Look Ahead and Foyer). Screening is incentivised with £5 vouchers. The service is also liaising with the charity Destiny Support to provide information in the form of posters and leaflets to asylum seekers and recent new entrants.

4.1.4 Gaps in service provision

Interviews with front-line professionals highlighted several gaps in service provision. In the Berkshire West TB service this included:

- Difficulty getting referrals to the NESS since closure of the Port Health Authority in March 2014, despite sustained efforts by the TB team to engage with local GPs
- No negative pressure room despite the professionals concerns around multi drug-resistant TB (MDR-TB). These cases are referred to the Churchill Hospital in Oxford.
- Concern regarding pathology services moving from Royal Berkshire Hospital to Frimley Park Hospital, resulting in a potential delay in diagnosis, particularly of MDR-TB
- Difficulty and a lack of clarity around the process of arranging housing for homeless cases and other social support

In the Berkshire East TB service, front-line professionals raised the following issues with service provision:

- Working with and engaging community leaders and community groups on tuberculosis
- Arranging social support or housing for cases with complex social needs, though they noted that this had improved since developing a closer relationship with Public Health in local authority

Interestingly, the Berkshire East service has continued to receive some referrals since the Port Health Authority closed and they attribute this to ongoing engagement from some local GPs. Work is now underway to support GPs in other Slough practices to refer eligible patients on registration. The service also runs two clinics per week for screening new entrants.

An additional concern relates to referrals to newborns whose mothers are resident in Berkshire (particularly within Bracknell Forest) who are then referred on to community TB services based around Wexham. This is both inconvenient for the mothers themselves but also for community services and presents a higher risk of loss of contact or low attendance amongst service users.

4.2 Activity and performance of TB services

The following sub-section considers the data on activity and performance of Berkshire West and Berkshire East TB services based on ETS data for Thames Valley residents who use those services. As the ETS system only collects data on the management of presumptive or confirmed TB cases, it is difficult to compare the levels of activity for other aspects of each TB services work, such as screening and management of contacts, new entrants and/or latent TB infection, and BCG vaccination.

4.2.1 Hospital admissions

Of the 1158 patients who used TB services in Berkshire between 2008 and 2014, there is information for 915 regarding whether or not they were hospitalised (79%). In total, there were 183 admissions

(15.8%), though it is difficult to compare between services due to the incomplete data. No national data was available for comparison.

Table 22 Inpatient admissions for Berkshire East and West TB services, 2008-2014

Hospitalisation	n	%
Berkshire West TB services	556	
Yes	69	12.4
No	348	62.6
Unknown	132	23.7
Berkshire East TB services	602	
Yes	114	18.9
No	354	58.8
Unknown	123	20.4

4.2.2 Delay in diagnosis and treatment

Information on the time between onset of symptoms and onset of treatment was available for 249 of the 269 pulmonary TB cases (92.6%) who used Berkshire TB services between 2011 and 2014. The majority were Berkshire residents (257 out of 269, 95.5%). The delay is one of the PHE TB Strategy Monitoring Indicators²⁵ and represents the time from onset of symptoms to first presentation to a clinician, to diagnosis and to the start of treatment. As such, it can reflect a myriad of underlying factors including:

- The level of awareness amongst the public regarding TB and its symptoms
- Attitudes and beliefs regarding TB, including perceived and actual stigma towards the diagnosis
- The level of awareness amongst front-line professionals, including GPs and A&E staff around TB, latent TB and local referral pathways
- The accessibility of TB services and referral pathways

Table 23 and Table 24 present this data for Berkshire, with the time delay categorised in months and displayed for 2011-2014, due to the small number of cases being considered for each area.

As can be seen, the majority presenting to TB services in Berkshire will start treatment within 2 months (55.7% for East and 58.5% for West, Table 23). By residence, a similar picture is seen with 58.3% of cases resident in Berkshire receiving treatment within 2 months (Table 24). This is much higher than the proportion starting treatment within 2 months in the South East (30.7%) and England (39.5).²⁶ Of all the regions in England, the South East has the lowest proportion starting within 2 months.

Table 23 Pulmonary TB cases by delay from symptom onset to treatment start and TB service, Berkshire, 2011-2014

TB Service	0-2 months		2-4 months		4+ months		Total
	n	%	n	%	n	%	
Berkshire West	69	58.5	29	24.6	20	16.9	118
Berkshire East	73	55.7	40	30.5	18	13.7	131
Total	142	57.0	69	27.7	38	15.3	249

²⁵ PHE TB Strategy Monitoring Indicators. <http://fingertips.phe.org.uk/profile/tb-monitoring>

²⁶ See Fingertips tool. PHE TB Strategy Monitoring Indicators. <http://fingertips.phe.org.uk/profile/tb-monitoring>

The proportion presenting within 2 months appears to be broadly similar throughout Berkshire (Table 24), though West Berkshire and Wokingham appear to have lower proportions. However, the small number of cases in both areas makes it difficult to determine the significance of this difference.

Table 24 Pulmonary TB cases by delay from symptom onset to treatment start by residence, Berkshire, 2011-2014

Local authority	0-2 months		2-4 months		4+ months		Total
	n	%	n	%	n	%	
Bracknell Forest	11	68.8	<5	18.8	<5	12.5	16
Reading	55	62.5	18	20.5	15	17.0	88
Slough	60	58.3	32	31.1	11	10.7	103
West Berkshire	<5	33.3	6	66.7	0	0.0	9
Windsor and Maidenhead	13	56.5	6	26.1	<5	17.4	23
Wokingham	9	45.0	6	30.0	5	25.0	20
Total	151	58.3	71	27.4	37	14.3	259

When compared to Slough, residents in Reading appear to be more likely to start treatment within 2 months (62.5% vs. 58.3%). The median time from symptoms to treatment is 46 days in Reading and 53 days in Slough. This compares favourably to 2014 data for the rest of the South East (median delay is 89 days) and England (median delay is 74 days).

Table 25, Table 27 and Table 26 show the variation in delay from symptom onset to treatment start by gender, ethnicity and age group. Though based on small numbers, the data suggests that men and people in the 45-64 and 65+ age bands have longer delays. Those in the White population appear to have the longest delays, with 20% starting treatment more than 4 months after symptom onset. These factors are likely to relate to the difficulty in differentiating pulmonary TB from other respiratory illnesses in older age groups and non-migrant populations, and the low index of suspicion amongst clinicians.

Table 25 Pulmonary TB cases by delay from symptom onset to treatment and gender, Berkshire TB services, 2011-2014

Gender	0-2 months		2-4 months		4+ months		Total
	n	%	n	%	n	%	
Female	65	59.1	27	24.5	18	16.4	110
Male	76	55.1	42	30.4	20	14.5	138
Total	141	56.9	69	27.8	38	15.3	248

Table 26 Pulmonary TB cases by delay from symptom onset to treatment and age group, Berkshire TB services, 2011-2014

Age group	0-2 months		2-4 months		4+ months		Total
	n	%	n	%	n	%	
0-14	6	66.7	<5	22.2	<5	11.1	9
15-44	98	62.0	39	24.7	21	13.3	158
45-64	22	44.0	17	34.0	11	22.0	50
65+	16	50.0	11	34.4	5	15.6	32
Total	142	57.0	69	27.7	38	15.3	249

Table 27 Pulmonary TB cases by delay from symptom onset to treatment and ethnic group, Berkshire TB services, 2011-2014

Ethnicity	0-2 months		2-4 months		4+ months		Total
	n	%	n	%	n	%	n
Indian	41	60.3	18	26.5	9	13.2	68
Pakistani	32	57.1	15	26.8	9	16.1	56
White	25	51.0	14	28.6	10	20.4	49
Mixed/Other	24	63.2	8	21.1	6	15.8	38
Black-African	17	54.8	13	41.9	<5	3.2	31
Total	139	57.4	68	28.1	35	14.5	242

The delay in treatment starting appears to be lower in ethnic minority groups, than it is in the White population. However, there remains room for improvement.

A community consultation in Reading and Slough²⁷ found that a variety of factors likely to contribute to delays in starting treatment, including knowledge and awareness about TB and stigma around the diagnosis of TB.

4.2.3 Directly observed therapy

Overall, 5% of cases notified from TB services in Berkshire, between 2011 and 2014, received directly observed therapy (DOT). This is lower than for the rest of the South East, where 13% received DOT, and nationally (12%). This difference may in part be explained by the lower proportion of cases with social risk factors in Berkshire. Social risk factors associated with TB include, but are not limited to, crowding, poverty, malnutrition and alcohol/substance abuse.²⁸

Table 28 TB cases by delay from symptom onset to treatment and ethnic group, Berkshire TB services, 2011-2014

TB Service	Received DOT		Did not receive DOT	
	n	%	n	%
Berkshire West	20	6.3	299	93.7
Berkshire East	15	4.0	357	96.0
Total	35	5.1	656	94.9

4.2.4 Treatment outcomes

For TB cases between 2008 and 2013, the treatment outcome at 12 months was available for 98.7%. The vast majority completed their course of treatment (89.7% in Berkshire West and 90.5 in Berkshire East). This is higher than the average of 84.8% for England and 86.2% in South East.

²⁷ Lizzie Moore and Jo Jefferies. 2015. "T-what?!" Report on community consultation activities to inform the latent tuberculosis infection screening strategy for Slough and Reading. Berkshire Shared Public Health Team, Bracknell Forest Borough Council

²⁸ Hargreaves JR, Boccia D, Evans CA, Adato M, Petticrew M, Porter JDH. *The Social Determinants of Tuberculosis: From Evidence to Action*. Am J Public Health 2011;101(4):654–62.

Table 29 Treatment outcome for TB cases seen at Berkshire TB services, 2008-2013

Treatment outcome at 12 months	Berkshire West		Berkshire East	
	n	%	n	%
Not completed	12	2.2	21	4.1
Patient died before or while on treatment	<10	1.9	<10	1.6
The patient was lost to follow-up before the end of treatment	14	3.0	12	2.3
The patient's care was transferred to another clinic	<10	0.7	<10	0.2
Yes	417	89.7	464	90.5
Unknown	10	2.2	<10	1.4
Total	465	100	513	100

5 Service-User Views

A service user questionnaire was designed and piloted with the Royal Berkshire TB clinic. This was through a combination of face-to-face questioning after clinic appointments, postal questionnaire forms, phone calls and electronic surveys collected via Public Health England's Select-Survey tool. Responses tended to be greatest through face-to-face interviewing and through e-mailing service users a link to the online survey tool. Service-users often did not answer telephone calls, this could potentially be because outgoing calls from PHE display as 'unknown number' on mobile phones. Language issues were a cause for concern during the design phase of the survey and issues around this have still not been fully resolved. Nurses in the service utilise a mixture of booked translators attending in person, language-line phone translation service and peer translation via friends or family. We were unable to fully utilise the language-line service with one service-user who wanted to engage in the survey, simply due to them being hard of hearing. It is of concern that as it stands, the survey will not be answered by those who are in groups that are more difficult to engage in treatment. Generally service-users seemed happy to take part in the survey, though there was some concern about the possibility of responder bias leading towards overly positive responses.²⁹

Whilst only a small number of responses have been collected to date, these have been summarised in brief below. It is hoped that going forward, service-users will be able to utilise the tool to provide feedback to the service as part of a continuous evaluation process and that this will be expanded to cover East Berkshire services.

Respondents tended to speak English and primarily identify as Asian/Asian British (see Table 30). In terms of gender, a broadly equal split was observed with 7 (53.8%) females and 6 (46.2%) males responding. This broadly reflects the gender split observed in data pertaining to Berkshire tuberculosis cases. Most responders had been referred either by their GP (4, 30.8%) or by a hospital consultant/ward (4, 30.8%). Most comments about the service itself were extremely positive with most negative comments relating to either delays in being diagnosed/referred or to issues around car parking capacity and charges. Referral delays tended to be associated with complex clinical pictures but one responder reported a combined delay, with their GP taking some time to identify the problem and then a consecutive delay in A&E where the service-user expressed frustration about not being taken seriously. When asked what they particularly disliked about the clinic, car-parking was mentioned by 6 (50%) of responders. When asked what they particularly liked about the service, 75% of responders highlighted the relationship with the nurse team as being positive. Waiting times

²⁹ Davis et al. 2010. *Interviewer effects in public health surveys*.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2805402/>

and 'not feeling rushed' were also raised as good experiences. Most patients (82%) reported a journey time of 30 minutes or less to travel to the clinic, with the maximum reported being 45 minutes. In general service-users received written information and were happy with the information they received from the service, with a small number of suggestions around increasing the use of lay definitions (see Table 31). Service users routinely received contact details for the nursing team and had their test results explained to them.

Regarding clinic times, 12 (92.3%) responders thought their appointments were at convenient times, 1 responder suggested that clinics after 5:00pm or on weekends would be a good idea.

Table 30 Ethnicity Breakdown of Survey Responders

Ethnic Category	Count	Percentage
Asian/Asian British	6	46.2%
Black/ African/Caribbean/Black British	4	30.8%
White	2	15.4%
Prefer not to say	1	7.7%
Grand Total	13	100.0%

Table 31 Answers to the question 'Was the written information you were given useful, could it be improved?'

Responses
<i>Did not receive any written information</i>
<i>Fine as is, direct and to the point</i>
<i>It was detailed enough</i>
<i>It was very useful.</i>
<i>Leaflets were all ok</i>
<i>More information about children's tests</i>
<i>More layman's terms would be useful and make it more accessible</i>
<i>No problem understanding this information</i>
<i>Thinks it is good. Verbal reassurance is very good and very supportive.</i>
<i>Yes</i>
<i>Yes it was useful and handy to refer back to</i>
<i>Yes they were good but texts or emails could be sent as reminder rather than being in a leaflet which may be thrown away.</i>
<i>Yes, it was.</i>

6 Review of best practice

This section contains an outline of TB policies and strategies, and examples of best practice in service delivery based on available evidence.

6.1 TB policies and Strategies

- **Collaborative tuberculosis strategy for England: 2015 to 2020**

<https://www.gov.uk/government/publications/collaborative-tuberculosis-strategy-for-england>

- **Tuberculosis (NG33), NICE Guidelines, 2016**
<https://www.nice.org.uk/guidance/ng33>
- **The organisation and delivery of TB services: an evidence review, NICE, 2015**
<https://www.nice.org.uk/guidance/NG33/documents/tuberculosis-update-appendix-g7b2>
- **Latent TB Testing and Treatment for Migrants: A practical guide for commissioners and practitioners, PHE, 2015**
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/442192/030615_LTBI_testing_and_treatment_for_migrants_1.pdf
- **Tuberculosis case management and cohort review, Royal College of Nursing, 2012**
https://www2.rcn.org.uk/_data/assets/pdf_file/0010/439129/004204.pdf

6.2 Best Practice

- **Pan-London tuberculosis services: a service evaluation, Belling et al, 2011**
<http://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-12-203>
- **A new latent TB toolkit is due to be launched in July 2016 by TB Alert**
<http://www.thetruthabouttb.org/>

7 Summary and recommendations

7.1 Summary Points

Reading and Slough present the greatest level of concern in terms of incidence of tuberculosis within Berkshire, with Slough having one of the highest rates outside of London. Incidence rates for the whole of Berkshire have been increasing over the period 2008-2014, with this being driven primarily by increases in Reading. Certain ethnic background populations are at heightened risk, notably the following groups: Non-UK Born Indian; Non-UK born Pakistani and Non-UK Born Black-African. Despite being at a lower risk, the UK born white population also present a significant absolute volume of cases in the Berkshire area. In Reading, individuals born in Nepal also present in higher numbers than is observed in England as a whole. Individuals with tuberculosis in Berkshire appear to be younger than the population as whole, with a larger proportion of 15-34 year olds than is observed in the local area.

The time between entering the UK and being diagnosed with TB appears to be increasing, indicating a delay in diagnosis. It should be considered that this may be due to a relatively constant proportion of latent cases becoming activated in those who have been established in the area for some time.

A high proportion of TB cases are not in education or employment, however Berkshire appears to have a relatively lower proportion of TB cases who present with known risk factors such as homelessness or alcohol misuse when compared to England as a whole.

Staffing ratios in Berkshire East do not currently meet the level recommended by the Royal College of Nurses, although the situation is better in West Berkshire, staffing numbers may need to increase further if measures are taken to increase new entrant screening service referrals. West Berkshire is experiencing issues around reduced volumes of referrals of new entrants since the closure of the

Port Health authority, conversely the volume of referrals appears to have remained consistent within East Berkshire.

Supplies of BCG vaccine have now stabilised and a pragmatic policy has been established, aimed at prioritising delivery to high incidence areas, specifically areas of Reading and the entirety of Slough. A lack of negative pressure rooms in West Berkshire is a matter of concern, particularly regarding the handling of multi-drug resistant cases.

Limited information is available on specific under-served and high-risk populations, these may require further investigation. Both services have raised concerns around difficulties faced when attempting to arrange housing and social support for service-users in need of these. The location of the East Berkshire clinic is sited in Windsor, not in the area with highest incidence (Slough). This potentially presents some issues around access for individuals in East Berkshire.

7.2 Recommendations

Recommendations based on the findings of this health needs assessment are presented below and are aligned to the main headings of the Collaborative Tuberculosis Strategy for England.

7.2.1 Improve access to services and ensure early diagnosis

- Increase awareness about TB amongst local health and social care professionals as well as third sector organisations
- Ensure that new entrants are referred routinely to local services for screening through addressing issues with local pathways
- Work with local authorities to address social and economic risk factors related to TB

7.2.2 Provide universal access to high quality diagnostics

- Ensure that any issues resulting from the transfer of pathology services from Royal Berkshire to Frimley Park are fed back to the trust and to the appropriate commissioner to ensure a 24 hour turnaround on microscopy

7.2.3 Improve treatment and care services

- Ensure that there is adequate provision of negative pressure facilities for local TB services
- Provide service users with a means to feed into service design discussions
- Attempt to address barriers to access such as parking charges, language issues and travel time.

7.2.4 Ensure comprehensive contact tracing

- Continue to work closely with health protection colleagues to ensure robust and effective contact tracing takes place as standard

7.2.5 Improve BCG vaccination uptake

- Agree an evidence-based Berkshire BCG policy
- Monitor provision and uptake of BCG vaccination as new policies are implemented
- Ensure processes are in place to identify eligible babies, even in low-incidence areas

7.2.6 Reduce drug-resistant TB

- Tackle the clinical and social risk factors associated with development of drug resistance in under-served populations by maintaining high treatment completion rates and ensuring thorough contact tracing around MDR cases

7.2.7 Tackle TB in under-served populations

- Work to develop the provision of in-reach services to under-served and high-risk populations
- Align local service provision to these groups with NICE recommendations

7.2.8 Systematically implement new entrant latent TB screening

- Work to decrease the incidence of TB in Berkshire through investigating how a co-ordinated, local latent TB screening processes can be improved

7.2.9 Strengthen surveillance and monitoring

- Use available data sources to monitor and drive improvement in performance
- Gather service-user views on local services to identify and address potential issues and barriers to care

7.2.10 Ensure an appropriate workforce to deliver TB control

- Work with commissioners to ensure robust plans are in place for maintaining recommended levels of staffing for current and near-term future capacity

8 Appendices

8.1 “T-WHAT?!” REPORT ON COMMUNITY CONSULTATION ACTIVITIES TO INFORM THE LATENT TUBERCULOSIS INFECTION SCREENING STRATEGY FOR SLOUGH AND READING



COMMUNITY
CONSULTATION REP

8.2 SUMMARY OF THE COMMUNITY CONSULTATION WORKSHOPS HELD IN READING AND SLOUGH FOR THE LATENT TB NEW ENTRANT SCREENING SERVICE



Summary report for
community organisati

8.3 Service-User Questionnaire



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8.4 TB Profile for Slough, 2014



Slough TB profile
2014.pdf

8.5 TB Profile for Reading, 2014



Reading TB profile
2014.pdf

8.6 Service Mapping Questionnaire



Berkshire_Service_M
apping_Questionnaire