Public Health England

Protecting and improving the nation's health

Tuberculosis in North East England: Annual review (2015 data)

Data from 2000 to 2015

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

Public Health England, Wellington House, 133-155 Waterloo Road, London SE1 8UG
Tel: 020 7654 8000 www.gov.uk/phe
Twitter: @PHE_uk Facebook: www.facebook.com/PublicHealthEngland

About the Field Epidemiology Service

The Field Epidemiology Service (FES) supports Public Health England Centres and partner organisations through the application of epidemiological methods to inform public health action. FES does this in two main ways. Firstly, by providing a flexible expert resource, available, as and when needed, to undertake epidemiological investigations for key health protection work. Secondly, through the expert analysis, interpretation and dissemination of surveillance information to PHE Centres, local health partners, service providers and commissioners of services. Within the FES network, excellence and innovation is encouraged. We foster academic collaborations and take active part and lead in research, development and training. You can contact your local FES team at: FES.SEaL@phe.gov.uk Prepared by Field Epidemiology Service. For queries relating to this document please contact: se.TBsupport@phe.gov.uk

Facebook: www.facebook.com/PublicHealthEngland

Prepared by: Field Epidemiology Services (North East)
For queries relating to this document, please contact: Angela.Cox@phe.gov.uk

Published March 2017
PHE gateway number: 2016711

PHE supports the UN
Sustainable Development Goals

Contents

The data presented in this report are correct as at April 2016.

Acknowledgements

We are grateful to all those who contribute information on tuberculosis cases in the North East, including nurses, physicians, microbiologists, scientists, outreach and social care and administrative staff. We also acknowledge colleagues at the Newcastle Reference Laboratory for information on culture confirmation and drug susceptibility testing. Further thanks are due to the national Centre for Infectious Disease Surveillance and Control for matching the clinical and laboratory information, the North East Centre Health Protection team and the Field Epidemiology North East team for their work supporting Enhanced Tuberculosis Surveillance.

Authors

This report was prepared by Angela Cox of the Field Epidemiology Service North East, National Infection Service, PHE.

Suggested citation

Public Health England. (December 2016) Tuberculosis in North East: Annual review (2015 data), 2016. Public Health England: (North East)

Dear colleagues,

Tackling tuberculosis is one of PHE's seven national priorities for the next five to ten years. The Collaborative TB Strategy for England, published in 2015, has a clear aim to reduce the incidence of TB, ultimately to the point of elimination as a public health problem. This summaries our progress towards this aim in the North East in 2015.

The North East remains one of the lowest incidence regions in England, with only 4.9 cases per 100,000 population (compared with a national incidence of 10.5 cases per 100,000 population). However, this regional figure masks considerable in-region challenges: for example, Newcastle has 15.7 cases per 100,000 population, Middlesbrough 9.3 per 100,000. In addition, while the national incidence has shown a sustained significant descrease for three consecutive years, incidence in the North East has remained relatively static (subject to expected year-to-year variation).

Most North East pulmonary TB cases complete their treatment within 12 months. Given the prolonged nature of TB treatment, this is testament to the hard work undertaken and effective therapeutic relationships built by TB teams across the North East. Successful treatment on the first attempt contributes to the low incidence of antibiotic resistant TB in the North East (3% of cases). The commonest reasons for not completing treatment within 12 months were that a longer course of treatment was clinically necessary, or that the patient had died during treatment. However, a small number of patients were lost to follow-up: these were disproportionately patients born outside of the UK.

Hence, while TB cases are treated to a high standard in the North East, to reduce the incidence of TB in the population, we need to do more to identify and tackle TB in 'hard to reach' groups. There is a relationship between TB and deprivation in the North East, with incidence in the most deprived areas more than thrice that in the least deprived areas. Similarly, those born outside the UK are more likely to be diagnosed with TB, and also more likely to be lost to follow up during treatment. Under-diagnosis in under-served groups may further exacerbate the disparity.

The Yorkshire, Humber and North East TB Control Board was established in 2015, and has established a number of workstreams to co-ordinate action on tackling TB across our two regions. This has also stimulated the re-establishement of a North East multidisciplinary TB Network. As a result of the particular demography of TB cases in the North East, a focus of our region's work with the Board and Network over the coming year will be to explore how we can better target underserved groups.

Paul Davison,
Deputy Director of Health Protection,
PHE North East Centre

Notes on the report

Intended audience

This report is aimed at healthcare professionals involved in the diagnosis and/or treatment of TB patients, commissioners involved in planning and financing TB services, public health professionals working in the control of TB or health of at-risk populations, researchers with an interest in TB, and government and non-governmental organisations working in the field of TB. In particular we aim to update the Yorkshire and Humber and the North East TB Control Board.

Aim of report

This report describes the recent epidemiology of TB in the North East of England, providing an update on local trends, identifying areas of high burden of disease, at risk population groups, and opportunities for interventions and prevention of future cases.

Data sources

This report presents detailed data on TB case notifications made to the Enhanced Tuberculosis Surveillance system (ETS) in England to the end of 2015. Data from notifications made to ETS from 2000 are updated annually to take into account denotifications, late notifications and other updates. The data presented in the current year's report supersedes data in previous reports.

Other data displays

The national report presenting recent epidemiology of TB in England is available at https://www.gov.uk/government/publications/tuberculosis-in-england-annual-report

Additional high-level data on TB notifications in the UK to the end of 2015, and breakdowns by country, can be found in the Official Statistic for TB, 'Reports of cases of tuberculosis to enhanced tuberculosis surveillance systems: United Kingdom, 2000 to 2015'. This is available at https://www.gov.uk/government/collections/tuberculosis-and-other-mycobacterial-diseases-diagnosis-screening-management-and-data.

As part of the Collaborative TB Strategy for England 2015-2020, a suite of TB Strategy Monitoring Indicators have been developed (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/403231/Collaborative_TB_Strategy_for_England_2015_2020_.pdf).

Where data for these indicators are presented in this report, the indicator name is shown, and a summary table of national-level indicators is presented in Appendix V.

Data for indicators which are presented at Upper Tier Local Authority and Clinical Commissioning Group can be found at http://fingertips.phe.org.uk/profile/tb-monitoring and was updated with data for 2015 in October 2016. Specific indicators are also shown throughout the report where data are presented in relation to the indicator.

Executive summary

National

A total of 5758 cases were reported in England in 2015[1] a rate of 10.5 per 100,000 population, a decrease from the previous year (11.9 per 100,000) in 2014.

Regional

A total of 129 cases were reported to the Enhanced Surveillance system in the North East of England in 2015 a rate of 4.9 per 100,000 population, a decrease from the previous year (6.4 per 100,000 in 2014).

Local

Newcastle continued to have the highest rate, at 15.7 per 100,000 population in 2015. This was an increase from the previous year 14.5 per 100,000 population. North Tyneside and Redcar and Cleveland had the lowest rates, at 1.5 per 100,000 population a decrease from the previous year (North Tyneside 6.4 per 100,000 population) and (Redcar 4.4 per 100,000 population).

Age groups

In 2015 The age specific rates were highest in the 25-29 age group at 12.4 per 100,000 population. The rate in the <16 age group was 1.8 per 100,000 a decrease from the previous year (3.2 per 100,000)

Ethnic groups

As in recent years the most common ethnic group of TB patients in the North East was white, followed by Mixed/Other. Numbers of cases among the Bangladeshi and Mixed/ Other populations increased where as other groups saw a decrease in 2015 from previous year.

In 2015 a greater number of cases were born outside of the UK. Rates in UK born remain very low at 2.2 per 100,000 while the rate in non UK born was 58.3 per 100,000.

Clinical characteristics

In 2015 41% of cases reported in the North East had pulmonary disease of those cases 46% had a sputum smear result. Among those with a result 72% were sputum smear positive. In 2015 65% of all cases were confirmed by culture, 77% among pulmonary cases.

Treatment outcome

In cases reported in 2014 the last recorded TB outcome for the entire drug sensitive cohort (excludes cases in the drug resistant cohort) was 80.7%. The most common reason for non-completion was due to death
Among drug sensitive TB cases with non-CNS, spinal, miliary or cryptic disseminated disease, 82.4% of those notified in 2014 completed treatment within 12 months (compared with 81.1% in 2013). The most common reasons for non- completion were due to death (7%) and cases being lost to follow up (7%), of which most had left the UK. Half of the number of deaths were seen in th 65+ category. In most cases the relationship between TB and death was unknown.

Among drug sensitive TB cases with CNS, spinal, miliary or cryptic disseminated disease, 47% of those reported in 2014 completed treatment within 12 months; however many required continued treatment. A total of 63% had treatment completed at the last recorded outcome.

Drug resistance

Drug resistance was low in cases in 2015 with 4% of patients with isoniazid resistance and no cases with multi-drug resistance. Those with isoniazid resistant disease had no previous history of TB treatment: 1 of which were white and 1 were mixed/ other ethnicity, and all had pulmonary disease.

Complete and accurate surveillance data provides the evidence to review case management standards, and identify if opportunities for prevention have been missed.

Recommendations for local NHS and PHE staff include (i) ensuring that accurate information is completed on the PHE enhanced TB surveillance system, and (ii) that best case management is followed for all patients, including universal HIV testing, obtaining smear results. Reviewing of cases through cohort review ensures opportunities for prevention, early detection and successful treatment are not missed.

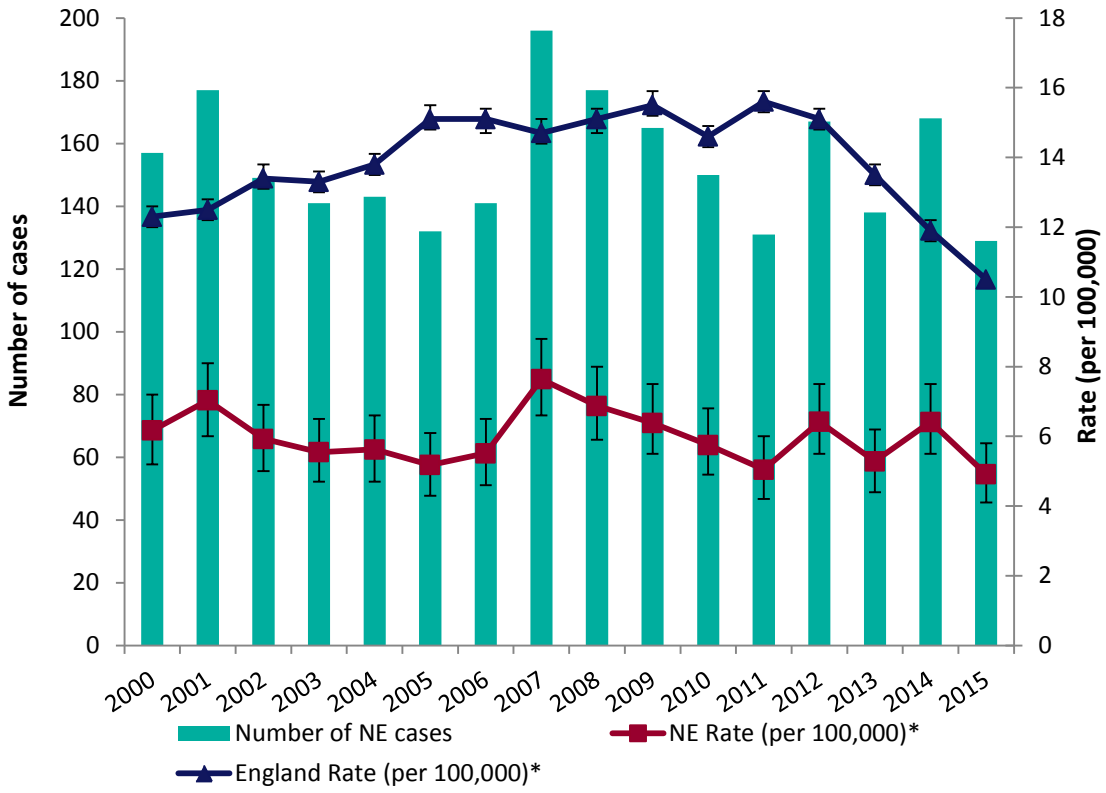
1. TB notifications and incidence

Overall numbers, rates and geographical distribution

In 2015, 129 tuberculosis (TB) cases were reported among North East residents, a rate of 4.9 per 100,000 population. This was an decrease of 23% compared to 2014 (Figure 1). The TB rate in the North East remained well below the national figure of 10.5 per 100,000 population.[1]

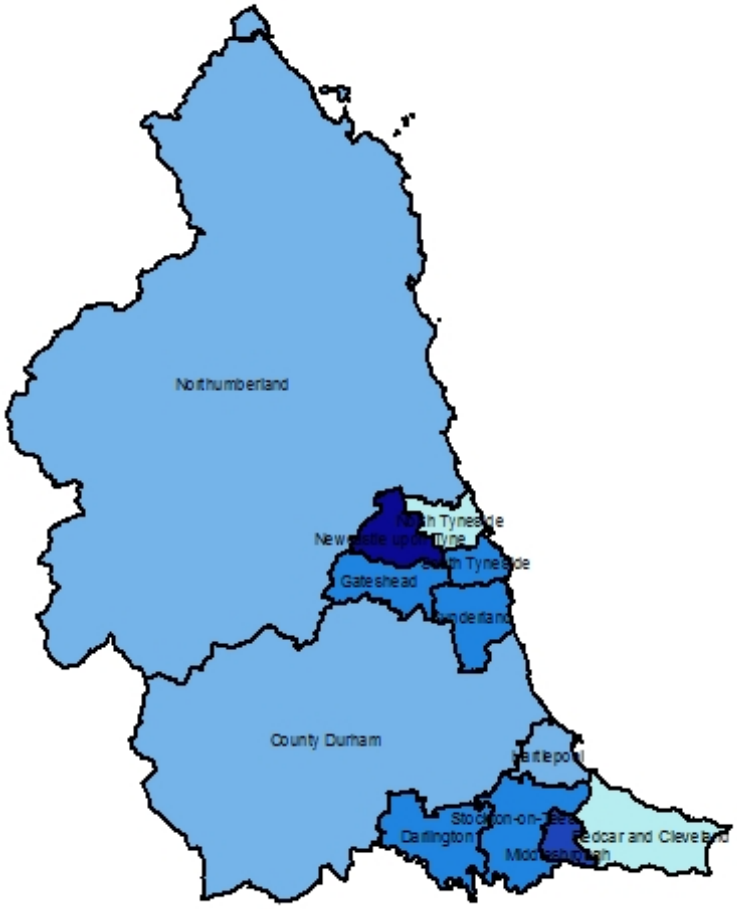
TB Monitoring Indicator 1: Overall TB incidence per 100,000 population (England and PHEC)

Figure 1: TB case reports and rates, North East and England rate, 2000 – 2015



The TB rate across each upper tier local authority in 2015 was between 1.5 and 15.7 per 100,000 (Figure 2). The highest rates could be seen in Newcastle upon Tyne and Middlesbrough and the lowest in County Durham and North Tyneside.

Figure 2: TB case rate* by upper tier local authority of residence, North East, 2015



*Rate per 100,000 population

Demographic characteristics

Age and sex

In 2015, 66% of TB patients were male and rates among males were slightly higher than females (4.9 per 100,000 and 3.3 per 100,000 in females). 12% of cases were aged 25 – 29.

In 2015, 6 children aged under 15 years old were reported, lower than previous year, (11 reported in 2014): 5 were UK born, 2 of which were Mixed/ other group; 1 white 1 Bangladeshi and 1 Pakistani group.

Three children aged under 5 years old were diagnosed with TB. All of whom were UK born: one white and two one mixed / other ethnicity. One of which had pulmonary/extra pulmonary and two had extra pulmonary disease.

Figure 3: TB case reports and rate by age and sex, North East, 2015

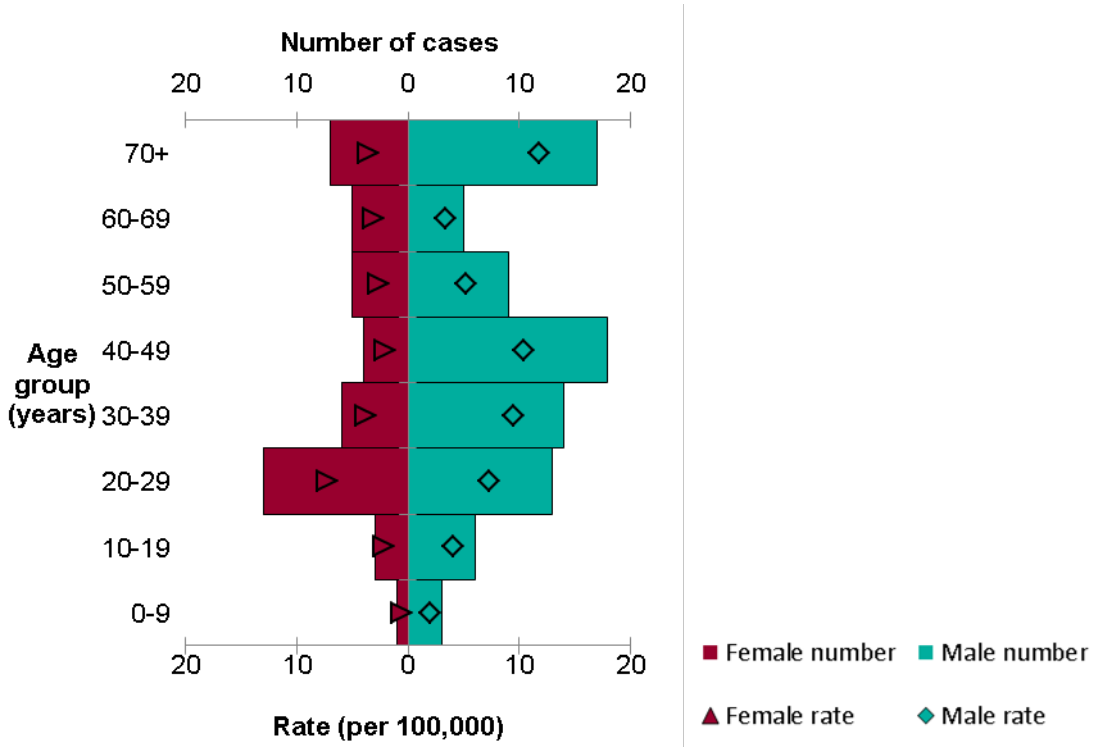
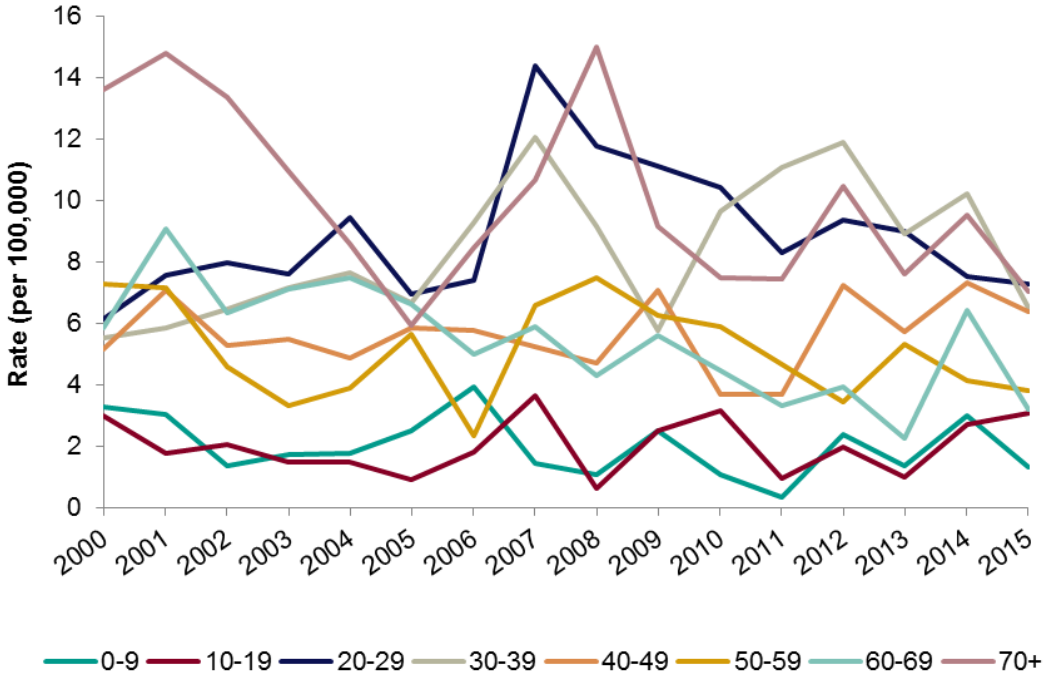


Figure 4: TB case rates by age group, North East, 2000 – 2015

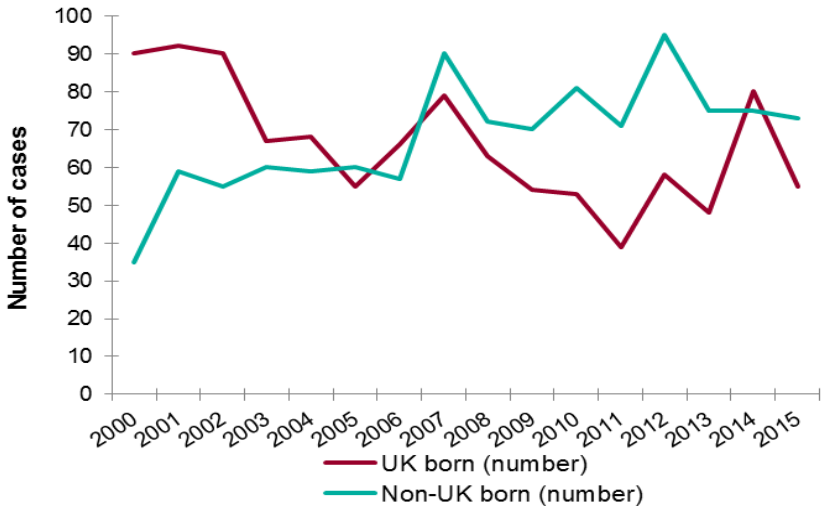


Place of birth and time since entry

In 2015 place of birth was known for 99% of North East TB cases. Of these 43% of TB patients were born in the UK. Rates in the UK born remain very low at 2.2 per 100,000 population while the rate in non UK born was 58.3 per 100,000. Numbers of UK born decreased in 2015 (Figure 4)

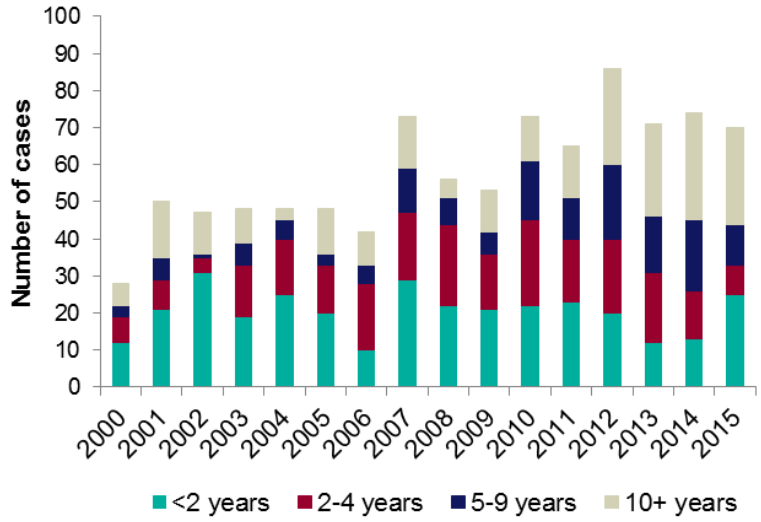
TB Monitoring Indicator 2: TB incidence in UK born and non-UK born populations (PHEC)

Figure 5: TB case reports by place of birth, North East, 2010 – 2015



Among those born abroad the number of cases in individuals who had been in the country for less than 2 years has increased from previous year.

Figure 6: Time between entry to the UK and TB notification for non-UK born cases by year, North East, 2000 – 2015



In 2015 21% non-UK born TB patients were born in India (Table 1). The next most common countries of birth were Pakistan, Philipines and Bangladesh. The two most common countries of birth remained the same as previous years.

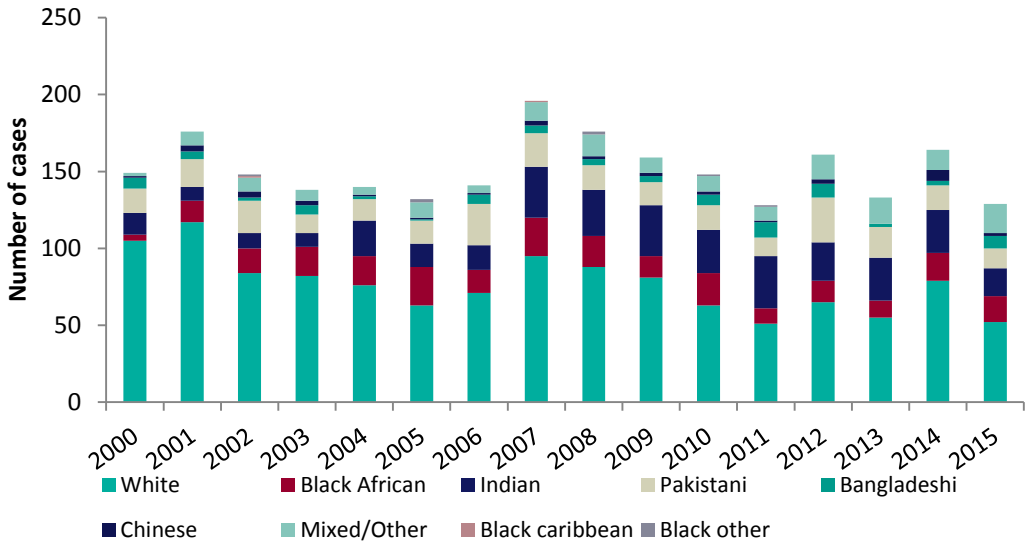
Table 1: Ten most common countries of birth of non-UK born TB patients, North East, 2015

Country of birth	n	% of non-UK born patients
India	15	21
Pakistan	12	16
Philippines	8	11
Bangladesh	7	10
Eritrea	5	7
Sudan	4	5
Congo	2	3
Hong Kong	2	3
Indonesia	2	3
Latvia	2	3
Nigeria	2	3
Romania	2	3
Others (each <=2 %)	9	12
Unknown	1	1

Ethnicity

As in recent years, the most common ethnic group of TB patients in the North East was white, accounting for 40% of cases (52/129).

Figure 7: TB case numbers by ethnic group, North East, 2000 – 2015



Of the UK born cases in 2015, the greatest proportion (87%, 48/55) were in the White ethnic group (Figure 8). Among the Non UK born, 23% (17/73) were in the Mixed/Other group; 22% (16/73) were in the Indian and Bangladeshi group.

Figure 8: TB case numbers by ethnic group and place of birth, North East, 2015

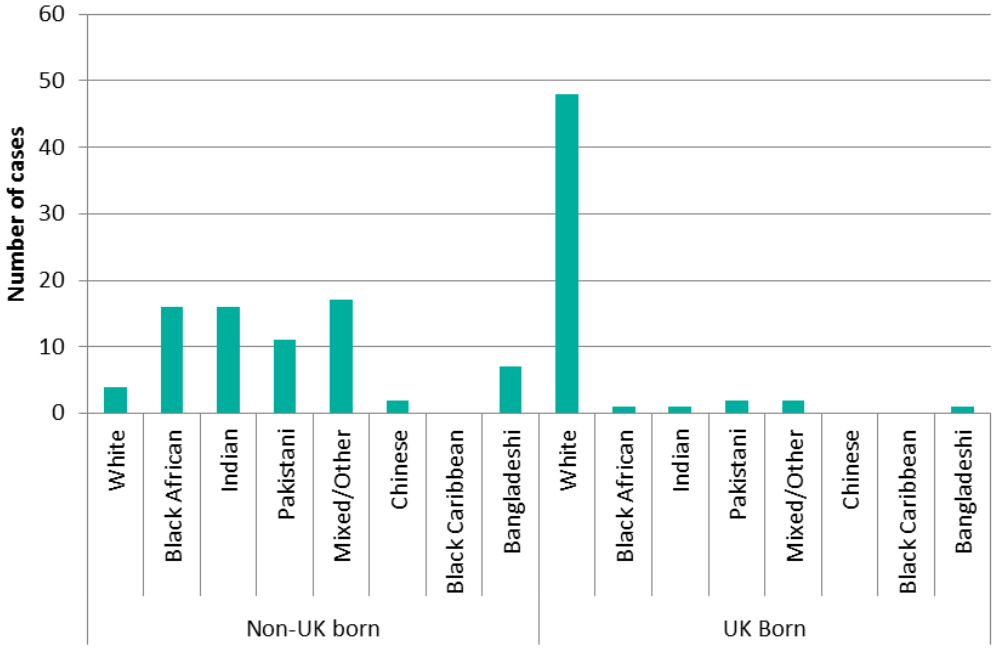
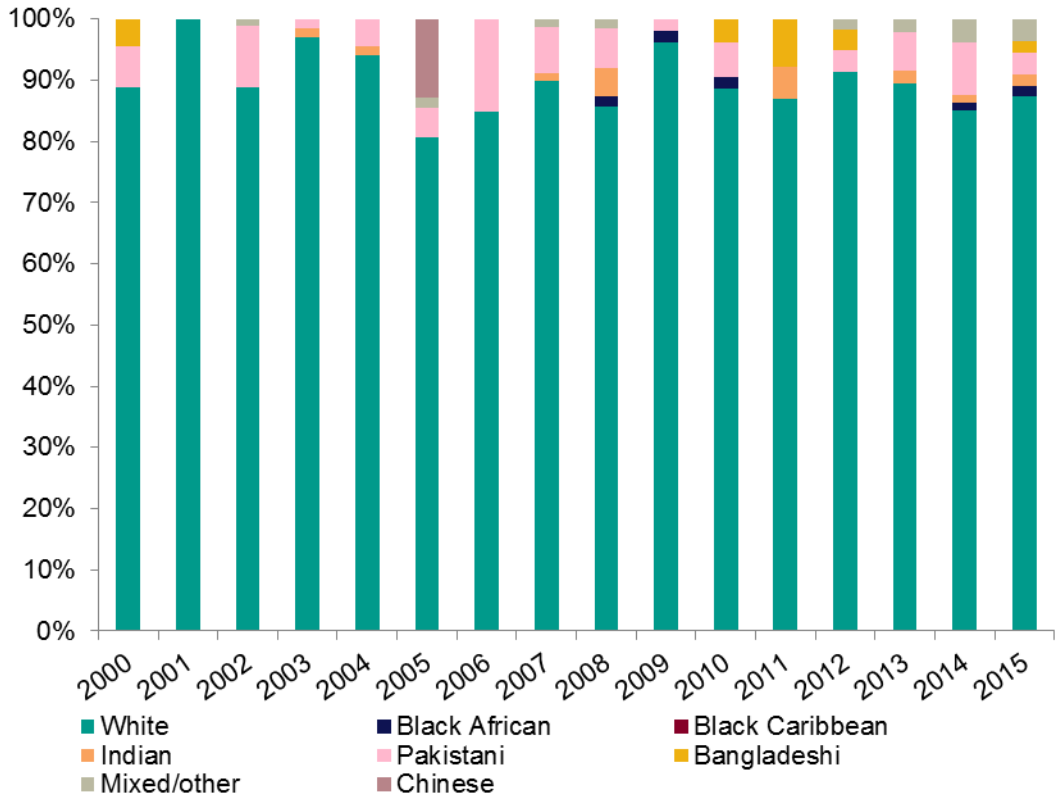


Figure 9: Proportion of UK born TB patients by ethnic group, North East, 2000 – 2015



Occupation

Table 2: Occupational category of TB patients aged 18 to 65 years, North East, 2015

Occupation	n	%	Total
Health care worker	6	7	89
Student	13	15	89
Other	34	38	89
None	36	40	89

In 2015 occupation was known for 95% (89/94) of North East TB cases aged between 18 and 65 years. Of these 40% (36/89) were not in education or employment; 15% (13/89) were either studying or in full time education; 7% (6/89) were healthcare workers and the remaining 38% (34/89) were working in other occupations.

Clinical characteristics

Site of disease

In 2015 41% of TB patients had pulmonary disease (Table 3). The next most common site was extra-thoracic lymph node TB. Pulmonary disease was more common among UK born than non-UK born (76%, 42/55 vs 37%, 27/73) and those with social risk factors: 71% of those with social risk factors had pulmonary disease (10/14).

Table 3: Site of disease of TB patients, North East, 2015

Site of disease	2015 n	%
Pulmonary	69	41
Lymph Node (extra thoracic)	26	15
IT Lymph Nodes	10	6
Other	13	8
Pleural	10	6
Gastrointestinal/Peritoneal	5	3
Bone/Joint (spine)	3	2
Bone/Joint (other - not spine)	2	1
Miliary	2	1
CNS (meningitis)	2	1
Genitourinary	6	4
CNS (Other - not meningitis)	3	2
Cryptic Disseminated	1	1
Laryngeal	0	0

*patients may have disease at more than one site, therefore the total % will not equal 100%

BCG Vaccination

BCG status was available for 83% of cases in 2015. Where data was available 70% of cases had received the BCG vaccination.

Table 4: Number and proportion of TB patients with BCG vaccination, North East, 2015

	<5 years old BCG vaccination			<16 years old BCG vaccination			All ages BCG vaccination		
	n	%	N	n	%	N	n	%	N
UK born	1	33	3	3	50	6	54	86	63
Non-UK born	0	0	2	2	100	2	21	48	44
All cases	**1**	**33**	**3**	**5**	**63**	**8**	**75**	**70**	**107**

Previous history of tuberculosis

In 2015, 4% (5/129) of cases had a previous diagnosis of TB, compared to 58% in 2014 (8/168).

2. Laboratory confirmation of TB

Laboratory tests data collection

Data for all culture confirmed TB isolates from the Mycobacterium Reference Laboratories, including speciation, drug susceptibility testing and Mycobacterial Interspersed Repetitive Unit-Variable Number Tandem Repeats (MIRU-VNTR) typing were matched to TB case notifications (see Appendix II: Methods), and the results were used to report culture confirmation. Results for microscopy, PCR and histology were also collected in ETS (see Appendix II: Methods).

Culture confirmation and speciation

In 2015, 65% of all cases were confirmed by culture (84). This increased to 77% (53/69) among pulmonary cases. 53% (31/59) of cases with extra pulmonary disease were culture confirmed.

Among the culture confirmed cases notified in the North East 98% (82/84) were identified as *Mycobacterium Tuberculosis (M.tuberculosis)* infection, 1.8% (2/114) with 2.4% (2/84) with *Mycobacterium africanum* (*M.africanum*) There were no cases of *Mycobacterium microti* or *Mycobacterium bovis*.

Sputum smear

Of the 69 pulmonary cases in 2015, (46%, 36) had a sputum smear result. Of these 72% (23) were sputum smear positive.

3. TB transmission

Rate of TB in UK born children

TB Monitoring Indicator 5: Incidence of TB in UK born children aged under fifteen years

In 2015, 6 children aged under 15 years were reported, 5 of which were UK born. 2 had pulmonary disease and 4 had extra pulmonary disease. This is a reduction from previous year where 11 children aged under 15 years were reported.

Strain typing and clustering

The National TB Strain Typing Service in England, established in 2010, prospectively types TB isolates using MIRU-VNTR. Clusters of TB cases with indistinguishable MIRU-VNTR strain types (clustered cases) may reflect cases that are part of the same chain of transmission, but could also reflect common endemic strains circulating either within England or abroad. MIRU-VNTR strain typing can be used to refute transmission between individuals, who have different strain types, but a common strain type does not confirm transmission; additional epidemiological information is required to assess whether a common strain type is likely to reflect recent transmission. Proportion of cases clustered and geographical distribution

Propotion of cases clustered

In 2015 there were 84 culture confirmed cases, all of which had an isolate that was strain typed. Of those whch had at least 23 loci typed, 52 (84%) did not cluster with any other strain type within the North East. The remaining 10 (16%) cases clustered with at least one other case in the North East. In total, different strain type clusters were reported during 2010 to 2015.

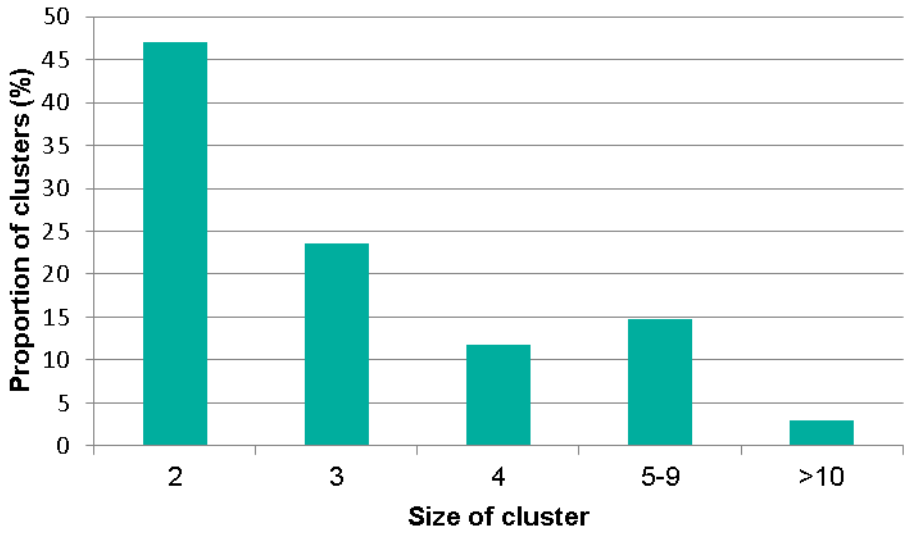
Table 5: Number and proportion of culture confirmed cases typed and number and proportion of cases in clusters, North East 2010 - 2015

Years	Culture confirmed cases n	Strain typed cases n	%	Strain typed >=23 loci n	%	Cases clustered n	%	Clusters n
2010	97	91	94	57	59	15	26	3
2011	104	103	99	85	82	18	21	5
2012	114	114	100	88	77	23	26	9
2013	106	105	99	69	65	27	39	7
2014	115	115	100	69	60	21	30	8
2015	84	84	100	62	74	10	16	2
	620	**612**	**99**	**430**	**69**	**114**	**27**	**34**

Size of clusters

Of the 34 clusters identified in the North East from 2010 – 2015 the majority of clusters (47%) consisted of two cases (Figure 10)

Figure 10: Proportion of TB clusters by size, North East 2010 - 2015



WGS

Whole genome sequencing (WGS) of Mycobacterium tuberculosis complex (MTBC) isolates provides information on single nucleotide polymorphism (SNP) differences between isolates, which provides more information than the currently deployed method (MIRU-VNTR strain typing) on how isolates are related to each other. WGS may therefore provide greater understanding of whether isolates are likely to be part of the same transmission chain, and may also help determine the timing and direction of transmission [2, 3, 4]. PHE is close to deploying the use of whole genome sequencing for TB for the NHS throughout England. It is hoped that this new technology will continue to add to the learning of TB transmission by providing robust genomic information to be used in conjunction with epidemiological and surveillance information.

4. Delay from onset of symptoms to start of treatment

Time symptomatic

The time between onset of symptoms and starting treatment was available for 92% of cases. (Table 6): the remaining patients were either asymptomatic at diagnosis, did not have a date of onset recorded or did not have a start or treatment date recorded.

The median number of days was 60. This was lower among those with pulmonary disease at 49 days.

82 % of pulmonary TB cases with a delay of four months or over were born in the uk; 73% of which were in the white ethnic group.

Table 6: Time between symptom onset and diagnosis*, North East, 2015

	Median days (IQR)	0-2 months		2-4 months		>4 months		
		n	%	n	%	n	%	N
Extra-pulmonary	**95 (7-1919)**	21	37	16	28	20	35	57
Pulmonary	**49 (0-302)**	39	64	11	18	11	18	61
Pulmonary smear positive	**45.5(0-295)**	14	61	4	17	5	22	23
All cases	**60 (0-1919)**	**60**	**50**	**27**	**23**	**32**	**27**	**119**

*excluding asymptomatic cases, and those with missing onset dates

TB Monitoring Indicator 6: Proportion of pulmonary TB cases starting treatment within two months of symptom onset (England, PHEC and UTLA data shown on Fingertips)

TB Monitoring Indicator 7: Proportion of pulmonary TB cases starting treatment within four months of symptom onset (England, PHEC and UTLA data shown on Fingertips)

5. TB outcome in drug sensitive cohort

Drug sensitive cohort

For the purposes of TB outcome reporting the drug sensitive cohort excludes all TB cases with rifampicin resistant TB (initial or amplified) including MDR-TB (initial or amplified), and non-culture confirmed cases treated as MDR-TB [5]. Under this definition, cases with resistance to isoniazid, ethambutol and/or pyrazinamide but *without* resistance to rifampicin are included in the drug sensitive cohort. For TB outcomes in the drug resistant cohort, see Chapter 6.

Treatment outcomes for the drug sensitive cohort are reported separately for the following groups:

- for cases with an expected duration of treatment less than 12 months, TB outcomes at 12 months are reported. This group excludes cases with CNS disease, who have an expected duration of treatment of 12 months. In addition, those with spinal, cryptic disseminated or miliary disease are excluded from this group, as CNS involvement cannot be reliably ruled out for the purposes of reporting.
- for cases with CNS, spinal, cryptic disseminated or miliary disease, the last recorded treatment outcome is reported.

1: Outcomes for TB patients with expected duration of treatment less than 12 months

82% of all cases with non – CNS, spinal, miliary or cryptic disseminated disease completed treatment within 12 months, higher than in previous years (Table 7) . This increases to 87% with deceased cases removed from the calculation.

Table 7: Number and proportion completing treatment at 12 months, North East, 2002 – 2014

	TB patients		
	n	%	Total
2001	128	77	167
2002	103	71	145
2003	87	65	134
2004	96	75	128
2005	77	61	126
2006	98	71	138
2007	139	78	178
2008	120	72	166
2009	111	73	153
2010	111	79	140
2011	89	74	121
2012	120	79	152
2013	99	81	122
2014	112	82.4	136

*** excludes rifampicin resistant TB, and patients with CNS, spinal, miliary or cryptic disseminated disease**

The most common reasons for not completing treatment was due to cases being lost to follow up and death on or before starting treatment (5%, Table 8). Of the 7 deaths recorded the relationship between TB and death was unknown for 4 cases. Of the 3 where this was reported 2 cases TB contributed to death and 1 case TB was incidental to death.

Table 8: TB outcome at 12 months, North East, cases diagnosed in 2014*

Outcome at 12 months	n	%
Completed	112	82
Died	7	5
Lost to follow up	7	5
Still on treatment	6	4
Treatment stopped	3	2
Not evaluated	1	1
Total	**136**	

*excludes rifampicin resistant TB, and patients with CNS, spinal, miliary or cryptic disseminated disease

Older patients were less likely to complete: just 72 % of those aged 65 years and over completed treatment (23/32), with higher rates of death (16%, 5). Treatment completion was higher in females (92% 49/53) than males (76%, 63/83).

Treatment completion was 82% among the UK born and 85% for those born abroad. Those born abroad were more often lost to follow up (8%, 3 vs. 0%, 0), while the UK born were more likely to die (8 %, 5 vs. 0%, 0) or still be on treatment (8%, 5 vs 2%,1)

2: Outcomes for drug sensitive cohort of patients with CNS, spinal, miliary or cryptic disseminated TB

Just under half of the 30 patients with rifampicin sensitive, CNS, spinal, miliary or cryptic disseminated disease, completed treatment within 12 months (Table 9). Patients were commonly still on treatment (23%). The cases that did not complete treatment most often due to death (17%), TB being incidental to death for 60% (3/5) cases, contributed to death 20% (1/5) case and caused death 20% (1/5).

Table 9: TB outcome at 12 months for patients with rifampicin sensitive, CNS, spinal, miliary or cryptic disseminated disease, North East, cases diagnosed in 2014* excludes rifampicin resistant TB

Outcome at 12 months	n	%
Completed	14	47
Died	5	17
Lost to follow up	1	3
Still on treatment	7	23
Treatment stopped	2	7
Not evaluated	1	3
Total	**30**	

Deaths and lost to follow up in the entire drug sensitive cohort

The proportion of cases in the entire drug sensitive cohort who had died at the last recorded outcome has remained fairly stable since 2004, ranging from 8% to 12% overall; and remaining at 7% from 2013 to 2014. Of the 166 cases notified in 2014, 12 cases died. Of these, the relationship between TB and death was unknown for 58% (7/12) of cases. TB caused 25% (3/12) of deaths; contributed to 8% (1/12) of deaths and was incidental to 8% (1/12) of deaths.

The proportion of drug sensitive cases that were lost to follow up at the last recorded outcome has ranged from 1% to 9% overall since 2004. Five per cent (8/166) of cases were lost to follow up in 2014. Of these, 88% (7/8) were born outside the UK; 12% country of birth was unknown (1/8). Males accounted for 88% (7/8) of cases lost to follow up and 75% (6/8) were in the 15-44 age group.

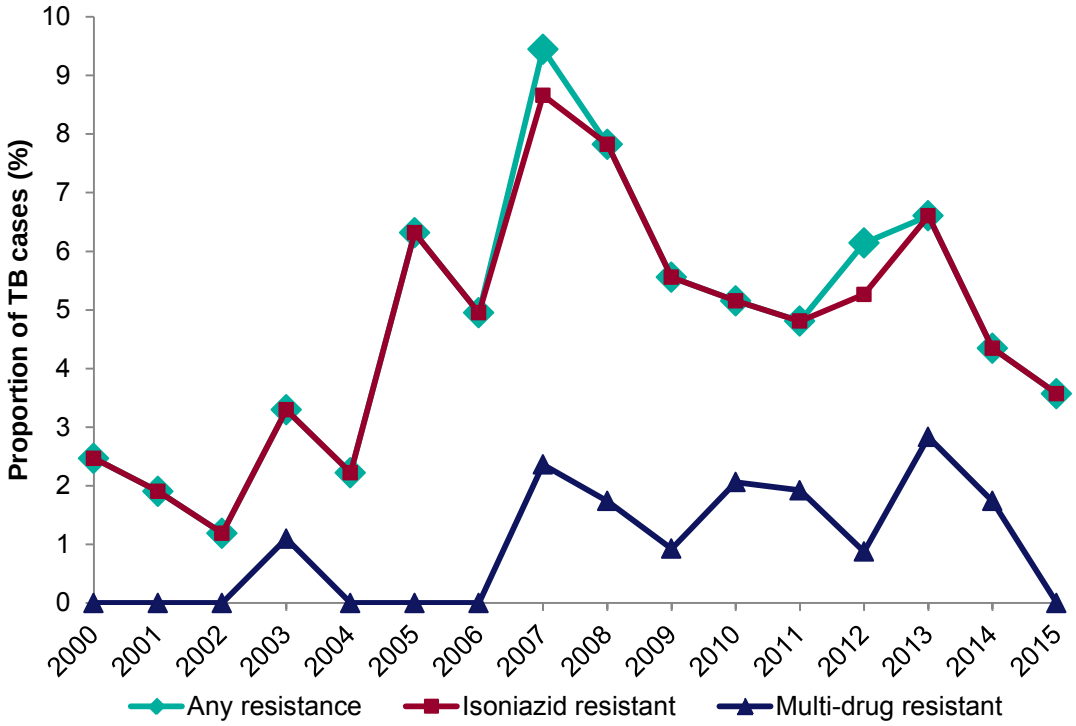
6. Drug resistant TB (including outcomes in the drug resistant cohort)

Drug resistance

Overall initial drug resistance and geographical distribution

In 2015, 3.6% (3) of TB cases were resistant to one or more first line drugs: all had isoniazid resistance. All of those with isoniazid resistance disease had no previous diagnosis of TB. Most were male and aged between 32 and 43 years old. Patients were most often white, 67% (2/3), and 67% were Non UK born (2/3). All had pulmonary disease.

Figure 11: Proportion of TB cases with initial first line drug resistance, North East, 2000 – 2015



TB outcome at 24 months for patients with rifampicin resistant disease

In 2013, 3 cases had rifampicin resistant TB and each of these cases had MDR-TB. 2 cases were male and 1 case was female; 2 cases were in the 15-44 age group and 1 case in the 46-64 age group. Two cases were born outside the UK and entered the UK between 4 to 6 years prior to notification.
At 12 months, 2 cases were still on treatment and treatment was stopped for the remaining case. At 24 months both cases still remained on treatment.

Table 10: TB outcome at 24 months for patients with rifampicin resistant disease, North East, cases diagnosed in 2013

Outcome at 24 months	n	%
Completed	0	0.0
Died	0	0.0
Lost to follow up	0	0.0
Still on treatment	2	66.7
Treatment stopped	1	33.3
Not evaluated	0	0
Total	**3**	

7. TB in under-served populations

Social risk factors

In 2015, 14 patients were reported as having one or more social risk factor (11% of all patients, and 12% of those where this information was recorded). 5 patients were recorded as having 2 or more social risk factors (4%) For each risk factor, 4% reported alcohol misuse, (5/121), 7% imprisonment (8/121), 4% reported homelessness (5/121) 3% reported drug use (4/118).

50% of all patients with a social risk factor were UK born (7/14).

Table 11: Social risk factors among TB patients, North East, 2009 – 2015

	Any risk factor		Total
	n	%	
2009	14	14	103
2010	12	9	131
2011	14	12	113
2012	15	10	143
2013	12	10	124
2014	13	9	149
2015	14	12	115

Table 12: individual social risk factors among TB patients, Noth East. 2015

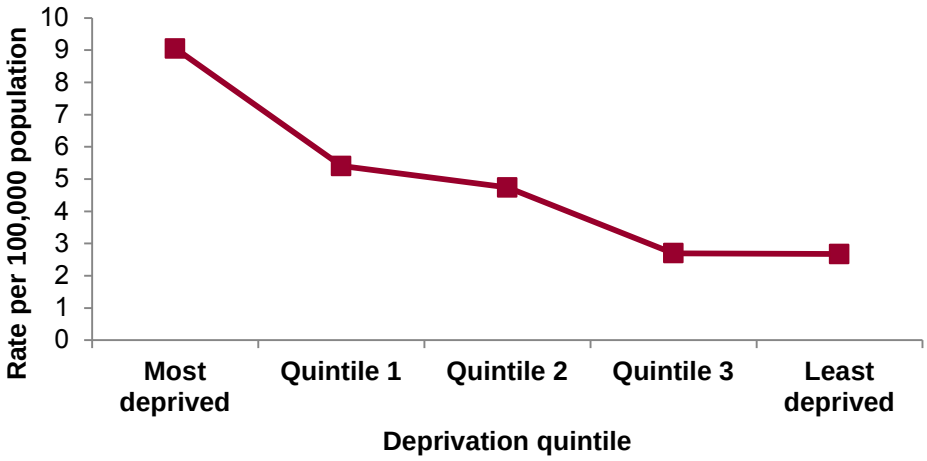
	n	%	Total
Homelessness	5	4	121
Imprisonment	8	7	117
Drug misuse	4	3	118
Alcohol misuse	5	4	121

TB Monitoring Indicator 17: Proportion of drug sensitive TB cases with at least one social risk factor who completed treatment within 12 months (England and PHEC)

Deprivation

There is a clear relationship between TB and deprivation in the North East, with higher incidence rates seen in the most deprived areas (Figure 12). In 2015, the rate of TB was 9.1 per 100,000 in the 20% of the population living in the most deprived areas compared with only 2.7 per 100,000 in the 20% of the population living in the least deprived areas.

Figure 12: TB case rate by deprivation, North East, 2015



8. HIV testing among TB cases

HIV testing

Information was available on 94% of patients* (116/124). 86% were offered** an HIV test (96/111). 14% of cases were not offered a test(15/111). Among those offered testing, uptake was high (97%, 93/96).

Offer of an HIV test was lower among UK born (76%, 35/46 vs. 93% of non- UK born, 60/64) 1 case unknown born in the UK was offered and received testing.

Of 6 children with TB in 2014, 1 was offered and done, the rest were not offered testing.

*Excludes cases identified at post mortem **excludes cases identified at post mortem and those where HIV status is already known

TB Monitoring Indicator 16: Proportion of TB cases offered an HIV test (England, PHEC, UTLA and CCG data shown on Fingertips)

Discussion

In January 2015, PHE and NHS England published the Collaborative TB Strategy for England 2015-2020[6], which sets out the actions required to achieve a year on year reduction in TB incidence and a reduction in the health inequalities associated with the disease. This report of TB surveillance data for North East England up until the end of 2015 provides a comprehensive overview of the epidemiology of TB in the North East England following the implementation of the strategy.

Numbers and rates of TB in the North East remain low and below the national average.

A decrease was seen in the cases born in the UK from the previous year. A greater number of TB patients were born abroad vs. UK born. Rates in the UK born remain very low.

HIV testing was not offered, or not recorded as offered to 19% of patients. UK guidelines recommend all TB patients should be offered a test, regardless of age or ethnicity or where they are resident[3].

Information on symptom onset was well completed and identified longer delays in extra pulmonary cases.

A very low proportion of pulmonary cases had a sputum smear results, just under half . This is an important indication of infectiousness, and should be done on all patients where possible.

Treatment completion at 12 months among patients with rifampicin sensitive and non-CNS, spinal, miliary or cryptic disseminated disease in the North East was below the national figure. The most commonly reported reason for not completing was due to being still on treatment. The next most common reason was due to death. The relationship between TB and death was poorly completed. This information is important.

Conclusion and recommendations

This report updates the latest epidemiology of TB in the North East, describing those populations at increased risk of disease. This evidence can help services implement the basic elements of TB control, namely prompt identification of active cases of disease, supporting patients to successfully complete treatment, and preventing new cases of disease occurring, through effective case management and robust contact tracing. The information will also be useful to target resources effectively.

Key recommendations for the NHS and PHE derived from the data presented in this report include:

1. Ensure relevant information is completed accurately on the PHE Enhanced TB Surveillance system.

2. Healthcare staff should offer universal HIV testing for all those diagnosed with tuberculosis and ensure where possible tests are done, in line with national guidance.[3]

3. Increase proportion of pulmonary patients with a sputum smear result to better inform local prevention activity.

4. Report treatment outcome for all patients, and review reasons why completion is low in some areas.

5. Refer to NICE guidance[4] and the Royal College of Nursing guidance on TB case management as best practice.[5]

References

1. Tuberculosis in the UK: 2016 Report (presenting data to end of 2015). Public Health England, October 2015.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492431/TB_Annual_Report_v2.6_07012016.pdf

2. World Health Organization. Definitions and reporting framework for tuberculosis – 2013 revision. WHO 2013.
http://apps.who.int/iris/bitstream/10665/79199/1/9789241505345_eng.pdf

3.British HIV Association. UK National Guidelines for HIV Testing. September 2008.
https://www.bhiva.org.uk/documents/guidelines/testing/glinehivtest08.pdf

4. National Institute of Health and Clinical Excellence. Tuberculosis – full guideline [Internet] 2011. http://www.nice.org.uk/cg117/resources/cg117-tuberculosis-full-guideline3

5. Royal College of Nursing. Tuberculosis case management and cohort review. RCN 2012. http://rcn.org.uk/_data/assets/pdf_file/010/439129/004204.pdf

6. Collaborative tuberculosis strategy for England: 2015-2020
https://www.gov.uk/government/publications/collaborative-tuberculosis-strategy-for-england

Appendix A: Description of data sources and definitions

Data sources
Data on TB cases in North East England comes from the national Enhanced TB surveillance (ETS) system. Data collected includes notification details, and demographic, clinical and microbiological information, including drug resistance and strain type, provided by the Reference Laboratory (Newcastle).

Treatment outcome
Information on outcomes were reported for all cases reported in the previous year, excluding those with known rifampicin resistant disease: outcomes for these cases were reported at 24 months. Definitions for outcome are based on World Health Organization (WHO) and European definitions, but adapted to the UK context. In this report, all data was obtained from the ETS matched dataset provided in September 2016.

Proportions
All proportions in this report are calculated among cases with known information or a known result, except where otherwise stated.

Confidence intervals
A 95% confidence interval for incidence was obtained using the relevant procedure in Stata, assuming a Poisson distribution.

Population denominator
Tuberculosis rates by geographical area (Centre, local authority, MSOA and LSOA), age, sex and place of birth were calculated using ONS mid-year population estimates.

Cluster definitions
Strain typing was performed at the TB reference laboratories using 24 MIRU-VNTR profiling. Analysis was undertaken on strain type clusters defined as two or more people with TB caused by indistinguishable strains, with at least 23 complete VNTR loci. Analysis of clustering was carried out on cases that clustered in North East England and notified between 2010 and 2015.