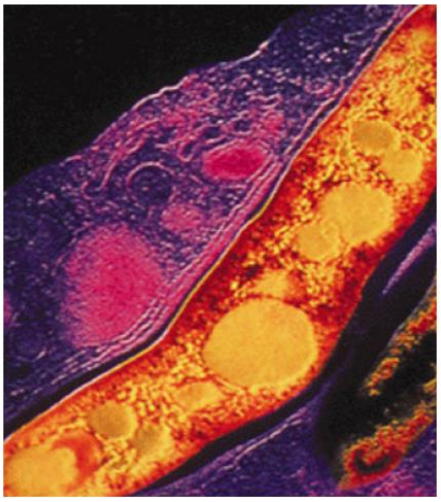
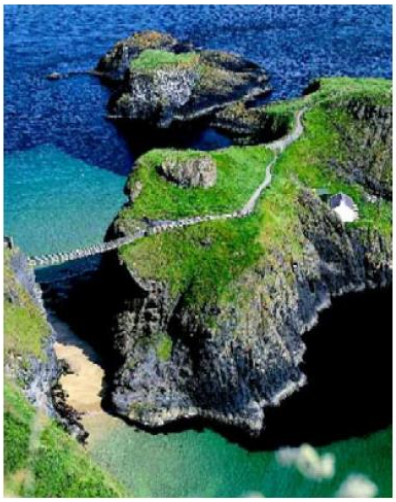
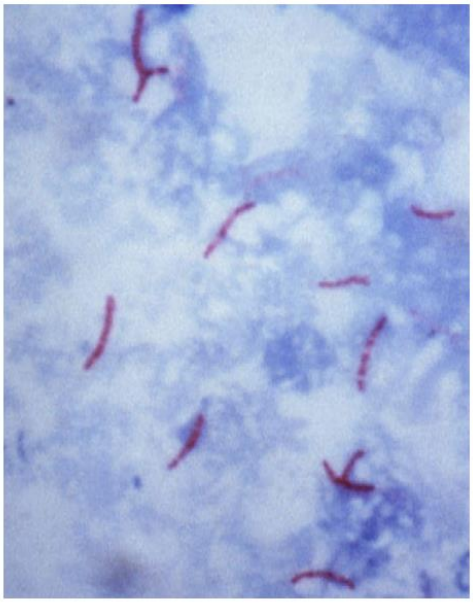
HSC Public Health Agency

Epidemiology of Tuberculosis In Northern Ireland

Annual surveillance report 2017







Acknowledgements

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Authors

M. G. O'Doherty, E.Dickson, E Walker and M. Devine

Public Health Agency
12-22 Linenhall Street
Belfast
BT2 8BS
Tel: 0300 555 0114

www.publichealth.hscni.net

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Key Points

- There were 71 cases of tuberculosis (TB) notified in Northern Ireland in 2017, giving a rate of 3.8 cases per 100,000 population. This represents a 17% decrease from the number of cases in 2016 but a 15% increase compared with the rate of TB in 2015 (3.3 per 100,000). It should be noted that relatively small differences in the number of cases can give rise to substantial percentage changes due to small numbers and considerable year to year variation.

- Rates of TB were highest in the Southern Health and Social Care Trust at 7.1 cases per 100,000 population, however this is a 13% decrease compared with 2016 when the rate in this Trust was 8.2 cases per 100,000.

- The highest rates of TB were in those aged 65 years and over at 5.3 cases per 100,000 population. This is a pronounced reduction in rate from 7.4 per 100,000 in 2016. This age group accounted for 23% of TB cases reported in 2017.

- The proportion of TB cases that were born outside the UK/Ireland increased from 45% in 2016 to 51% in 2017.

- The rate of pulmonary TB cases in Northern Ireland in 2017 was 2.5 per 100,000 population, similar to the rate in 2016. The rate of non-pulmonary disease decreased from 2.0 cases per 100,000 in 2016 to 1.3 per 100,000 in 2017.

- 4% of culture confirmed TB cases in 2017 were resistant to first line drugs, compared with 7% in 2016.

- The proportion of drug sensitive TB cases that completed treatment by 12 months, an indicator of the quality of the TB service, was 78% in 2016.

Introduction

This report presents the epidemiological data for tuberculosis (TB) cases reported in Northern Ireland from 1 January 2017 to 31 December 2017. For comparative purposes and to give indications of trends in TB epidemiology, this report will also present data from previous years.

Outcome of TB treatments are collected annually and reported in retrospect. The treatment outcomes reported in this report are therefore on individuals notified to the Public Health Agency from 1 January 2016 to 31 December 2016.

There may be slight differences in numbers of TB cases quoted in the UK National TB report compared with this regional report, principally due to differences in time of data extraction and analysis between the two reports. This regional report takes account of late notifications that may have been reported after the national data extraction process has taken place.

Definitions

Notified case: Refers to clinically active disease caused, or thought to be caused, by infection with organisms of the *Mycobacterium tuberculosis* complex (*M. tuberculosis, M. bovis, M.africanum*).

Culture confirmed cases: Where the diagnosis has been confirmed by culture as *Mycobacterium tuberculosis, M. bovis or M. africanum.*

Other than culture confirmed cases: In the absence of culture confirmation, a case with a clinician's judgement that the patient's clinical and/or radiological signs and/or symptoms are compatible with tuberculosis *and* a clinician's decision to treat the patient with a full course of anti-tuberculosis treatment[1].

Pulmonary tuberculosis: A disease involving the lung parenchyma and/or bronchial tree, with or without extra-pulmonary tuberculosis diagnosis.

Sputum smear result: Sputum smear positive tuberculosis is defined as a positive microscopy result on spontaneously produced or induced sputum.

Multi-drug resistance (MDR): Resistance to at least isoniazid and rifampicin[1].

Extensively-drug resistant (XDR): An MDR case with additional resistance to any fluoroquinolone and at least one of the second-line drugs (capreomycin, karamycin, amikacin)[1].

Health and Social Care Trusts in Northern Ireland (HSCT): There are 5 HSCTs in Northern Ireland; Belfast (BHSCT), South Eastern (SEHSCT), Northern (NHSCT), Southern (SHSCT) and Western (WHSCT).

Treatment outcome: A patient is defined as having completed treatment if; a) the case was reported, b) the patient completed a full course of treatment and c) was officially discharged by the attending physician.

Methodology

Data collection

Completed TB notification forms are forwarded to the Public Health Agency (PHA) in Northern Ireland where the information is entered onto a secure database. Treatment outcome forms are generated and forwarded, approximately twelve months after initial notification, to the patient's clinician, who then returns them to the PHA. This information is then appended to the initial notification details.

Information on *Mycobacterium tuberculosis* complex isolates are obtained from local hospital diagnostic laboratories and the mycobacterial reference laboratory. Collected data include species (*Mycobacterium tuberculosis*, *M. bovis* and *M. africanum*), specimen type, strain type and drug susceptibility.

Data on cause of death, including TB, are also collected from the Northern Ireland Statistics and Research Agency (NISRA).

Datasets are validated (using laboratory reports and anti-microbial susceptibility information), updated and analysed.

Data analysis

Data are entered onto the PHE National Enhanced TB Surveillance database and analysed using STATA. TB rates per 100,000 population, stratified by age, sex and Health and Social Care Trusts in Northern Ireland (HSCT), were calculated using the mid-year estimates of the Northern Ireland population from NISRA.

Results

Overall number of cases and rates of infection

In 2017, a total of 71 cases of TB were reported in Northern Ireland. This gives a rate of 3.8 cases per 100,000 population, a 17% decrease from the rate of 4.6 cases per 100,000 reported in 2016, but a 15% increase compared with 2015 when the rate was 3.3 per 100,000 (Figure 1).

Figure 1: ***Tuberculosis case reports and rates, Northern Ireland, 2008-2017***

Northern Ireland is a low incidence region for TB averaging 4 cases per 100,000 population. The three-year moving average numbers and rates of notified TB cases for 2007-2017 are shown in Figure 2.

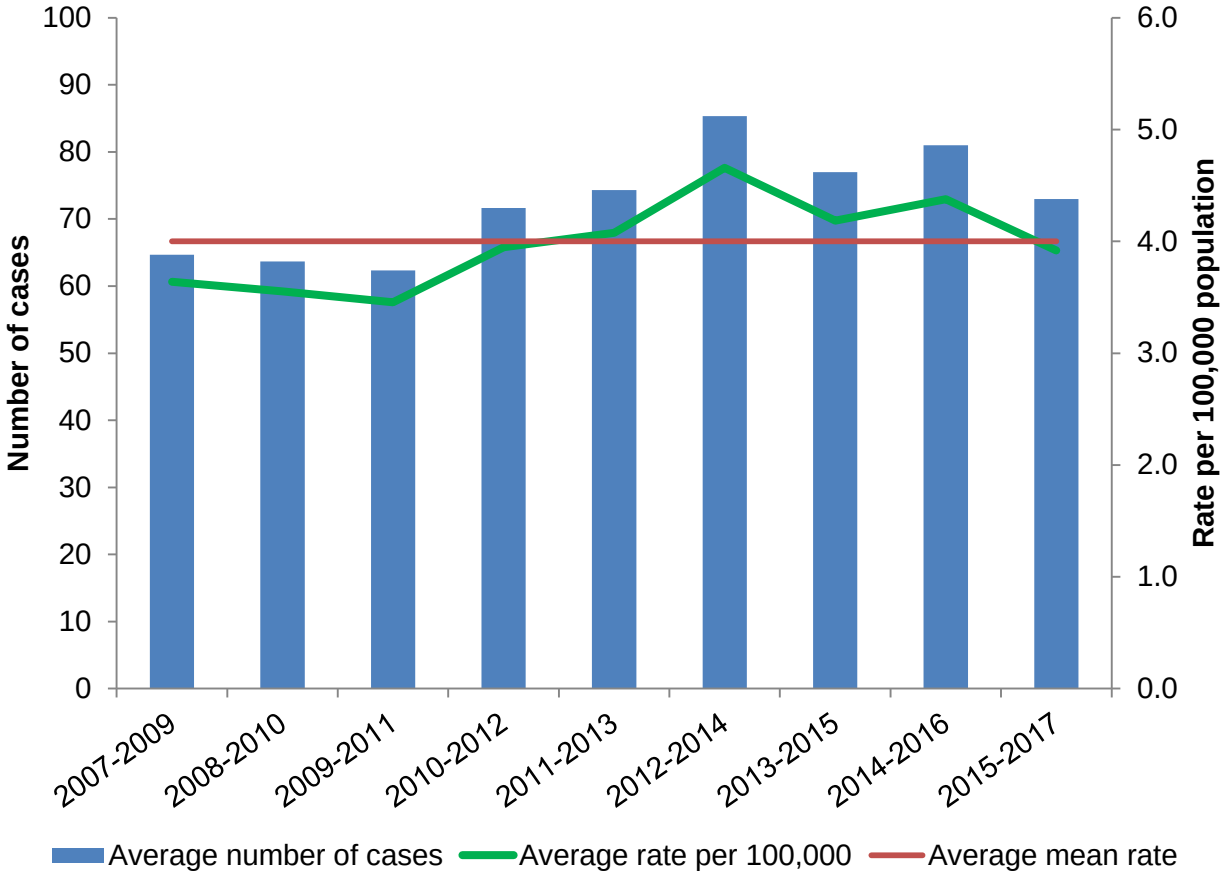


Figure 2: ***Three year moving average numbers and rates of Tuberculosis cases in Northern Ireland, 2007-2017***

In 2017, TB rates were highest in the Southern Health and Social Care Trust (SHSCT) at 7.1 cases per 100,000 population, a 13% decrease compared to 2016 when the rate was 8.2 per 100,000. TB rates also decreased from 2016 to 2017 in both the Belfast Health and Social Care Trust (BHSCT) from 6.2 to 3.7 cases per 100,000, and in the South Eastern Health and Social Care Trust (SEHSCT) from 2.5 to 1.1 cases per 100,000. Rates of TB in 2017 remained similar to 2016 in the Western Health and Social Care Trust (WHSCT) at 4.3 cases per 100,000. TB rates increased marginally in the Northern Health and Social Care Trust (NHSCT) from 2.3 to 2.9 cases per 100,000. Small numbers of cases in some of the Trusts will affect percentages (Figures 3 and 4).

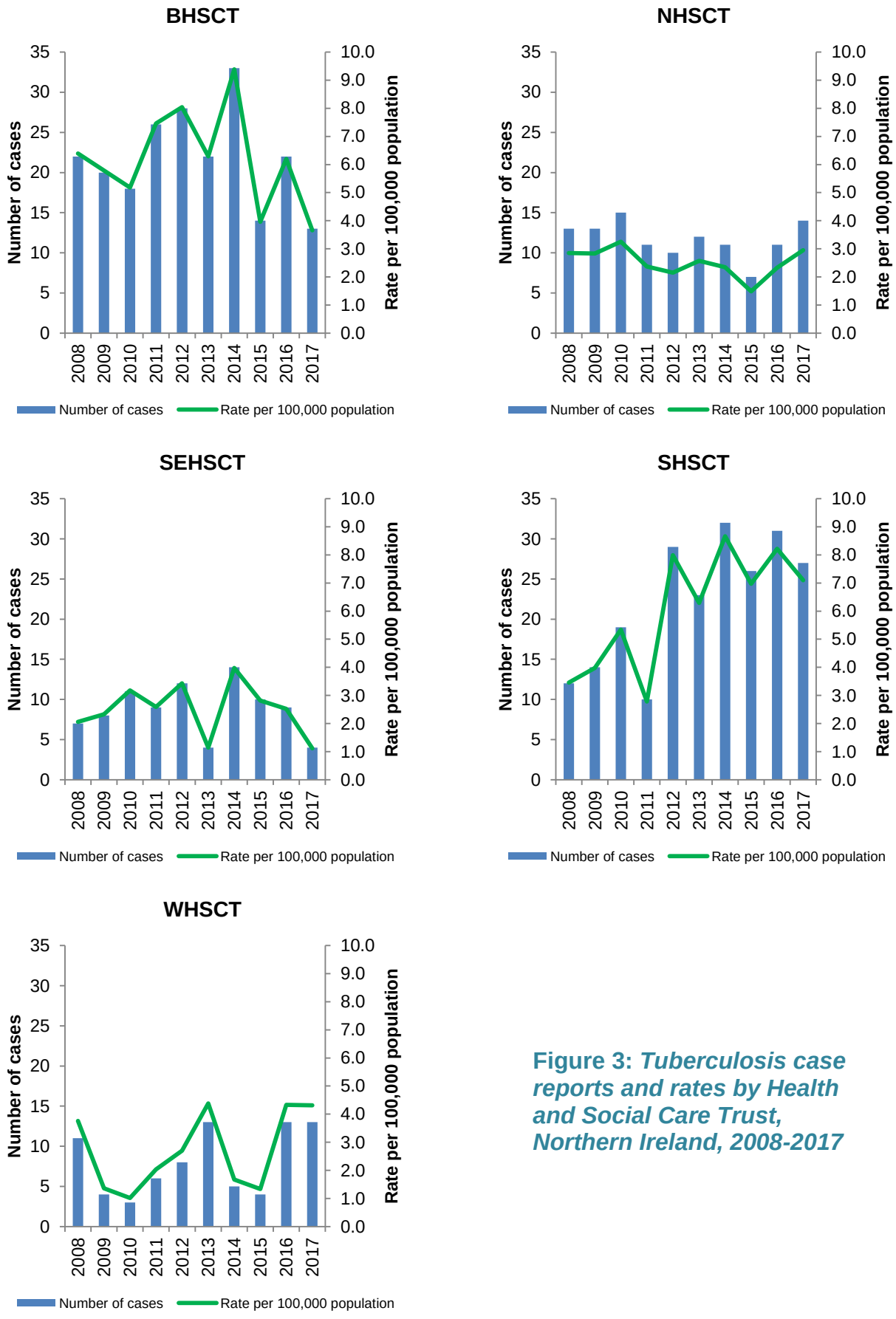


Figure 3: ***Tuberculosis case reports and rates by Health and Social Care Trust, Northern Ireland, 2008-2017***

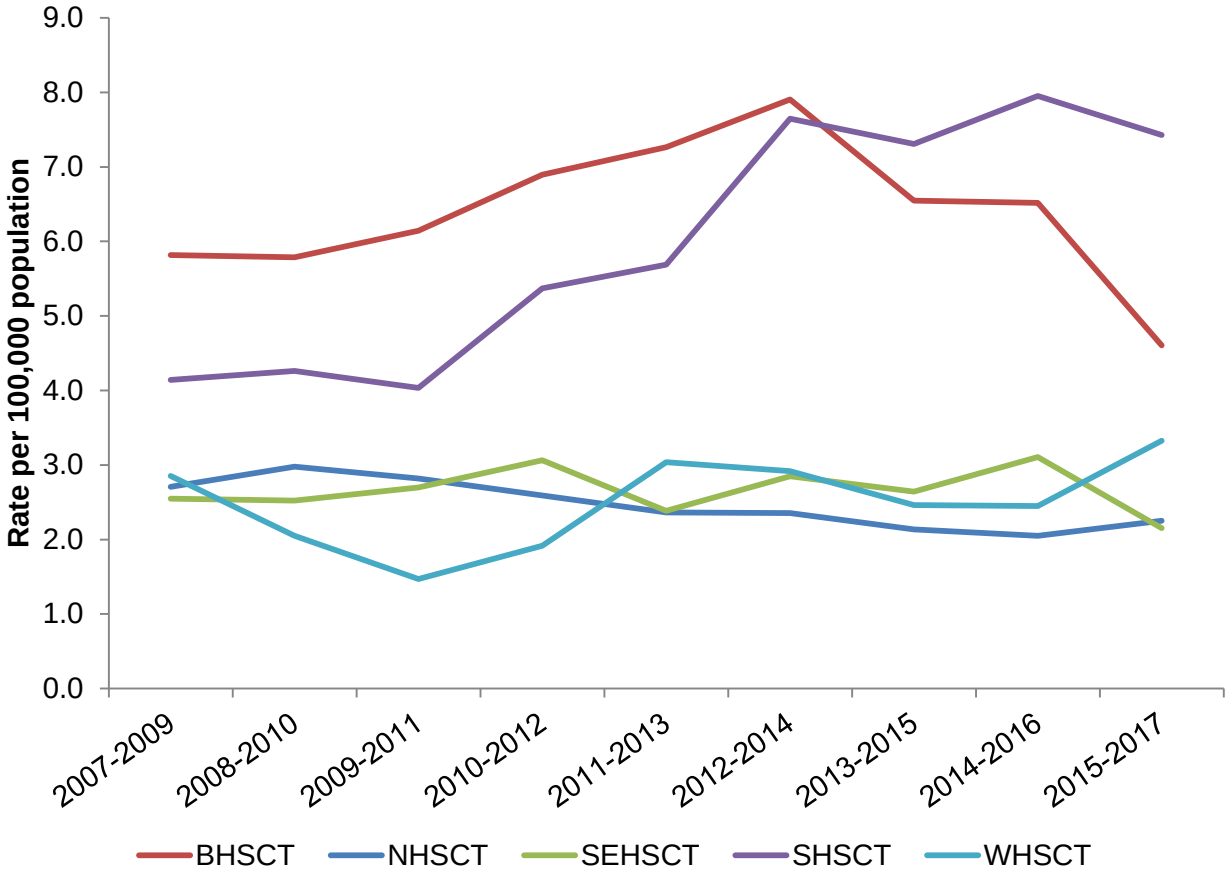


Figure 4: ***Three year moving average number and rates of Tuberculosis cases by HSCT in Northern Ireland, 2007-2017***

Demographic Characteristics

Age and gender:

Of the 71 notified cases of TB in 2017, 42 were male and 29 were female, giving a sex ratio male/female (M/F) of 1.45. The ages ranged from 2 years to 91 years, with a median age of 42 years and a mean age of 47 years.

Patients aged 15-44 years accounted for 48% of cases, an increase from 2016 when this group accounted for 42% of cases. Those aged 45-64 years accounted for 27% in 2017 (29% in 2016); those age 65 years and over accounted for 23% in 2017 (26% in 2016); and patients aged 0-14 years accounted for the remaining 3% of TB cases in 2017 (3% in 2016).

In 2017, rates of TB were highest in those aged 65 years and over at 5.3 per 100,000 population (Figure 5). Though TB rates decreased among all age groups, the decrease was

most pronounced in those aged 65 years and over (7.4 to 5.3 per 100,000 between 2016 and 2017), followed by those aged 45-64 years (5.3 to 4.0 per 100,000). Nevertheless, those aged 65 years and over once again have the highest average rate of TB in Northern Ireland (Figure 5a).

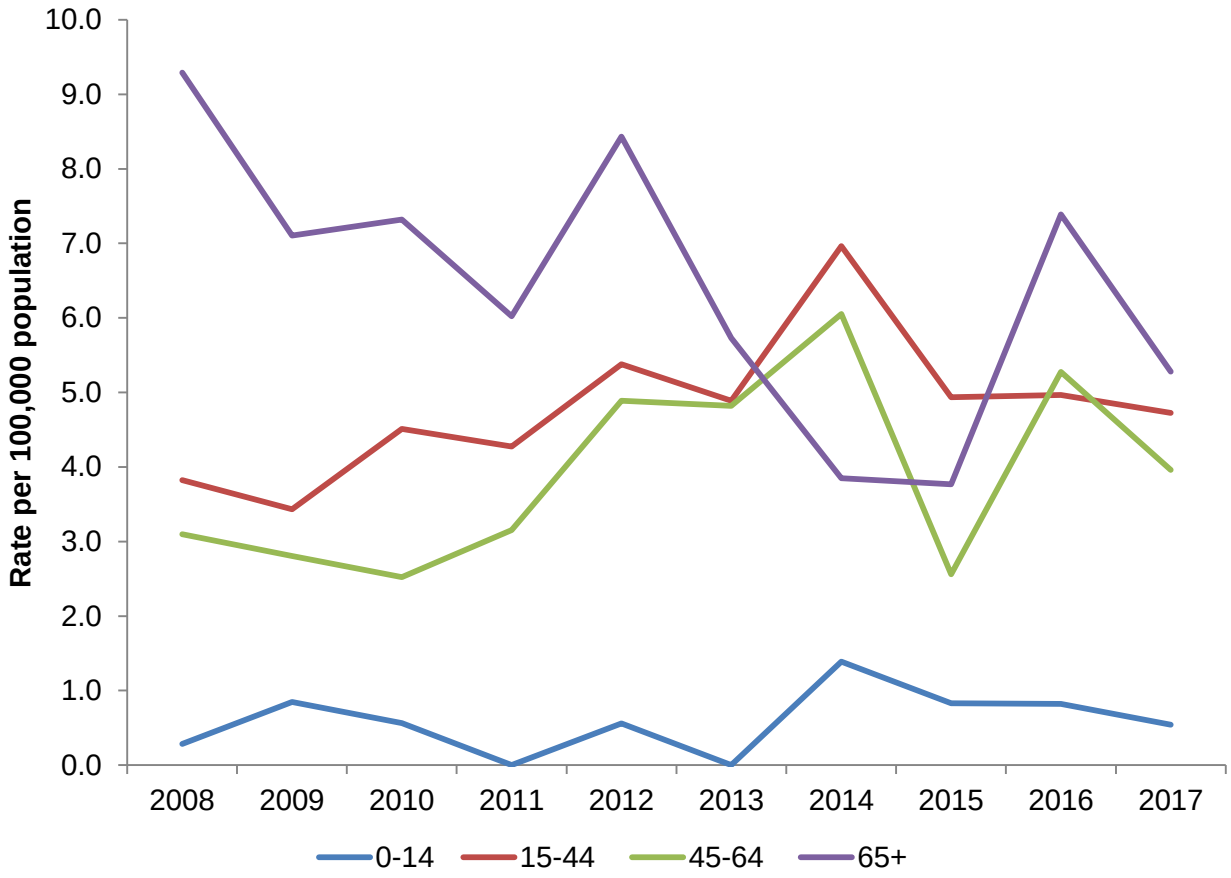


Figure 5: ***Northern Ireland TB rates per 100,000 by age group, 2008-2017***

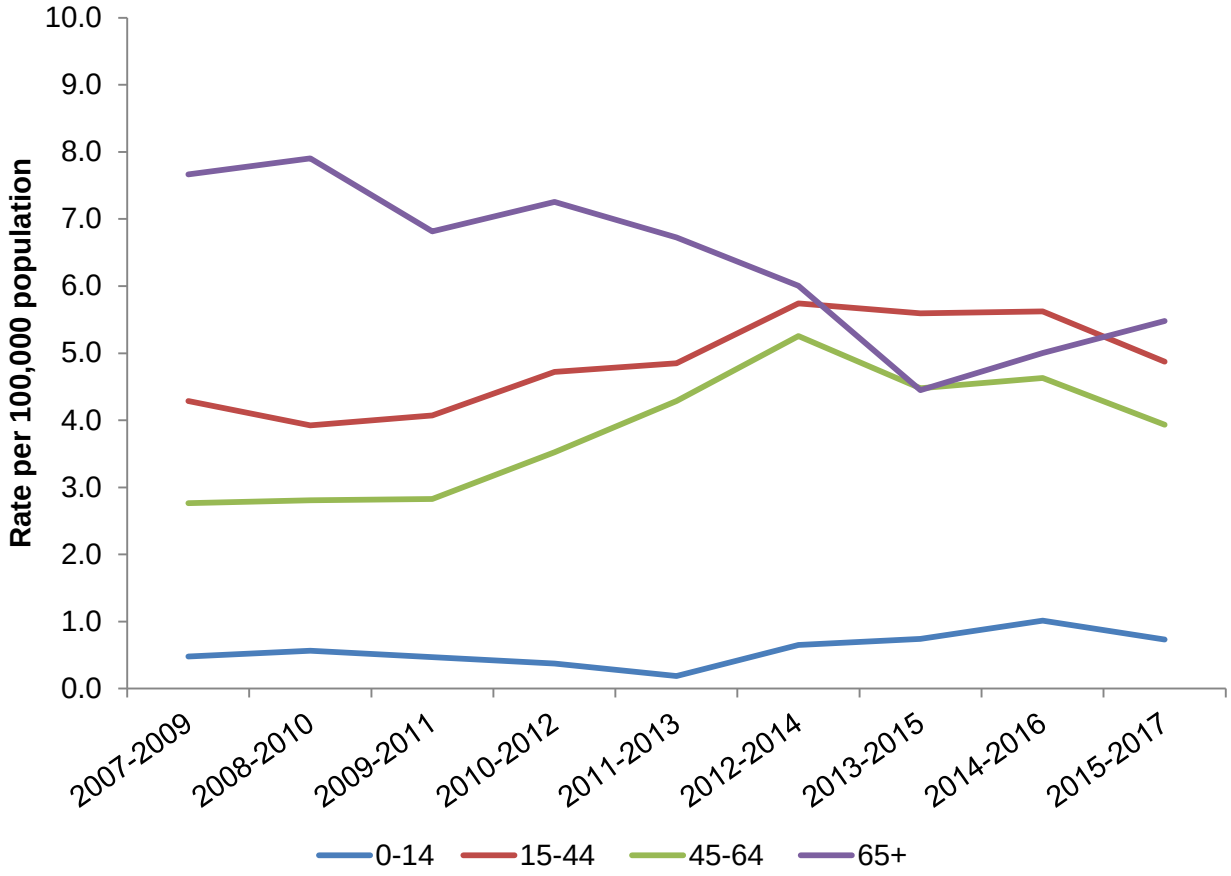


Figure 5a: ***Northern Ireland three year moving average TB rates per 100,000 by age group, 2007-2017***

Place of birth

In 2017, 51% (n=36/71) of TB cases were born outside the UK/Ireland, an increase compared with 2016 when the proportion of non-UK-born cases was 45%.

The rate of TB in the UK-born population remained relatively stable at 2.0 per 100,000 population in 2017 compared with 2.6 per 100,000 in 2016. The highest rates of TB remained in those born outside of the UK/Ireland, standing at 42.8 per 100,000. However, this rate is down from 46.5 per 100,000 in 2016 (Figure 6).

In 2017, the highest proportion of UK-born cases were in those aged 65 years and over (46%, n=16/35). 34% (n=12/35) of UK-born cases were in those aged 45-64 years, 17% (n=6/35) were aged 15-44 years and the remaining 3% (n=1/35) were aged 0-14 years. In comparison, the highest proportion of non-UK born cases were in those aged 15-44 years at 78% (n=28/36). 19% (n=7/36) of cases were reported in those aged 45-64 years and 3%

(n=1/36) were reported in those aged 0-14 years. There were no cases of TB reported in those aged over 65 years in individuals born outside the UK in 2017. In 2017 there was also some evidence of recent transmission with two cases of TB diagnosed in those aged 16 years or under. One of the two cases was born in the UK/Ireland.

The country of origin was known for 97% (n=35/36) TB cases born outside the UK/Ireland in 2017. The majority of TB cases born outside the UK/Ireland in 2017 originated from South-East Asia (66%, n=23/35). This proportion was higher than 2016 (46%) (Figure 7). Timor-Leste (49%, n=17/35), India (14%, n=5/35) and Romania (11%, n=4/35) were the most common countries of origin.

Information was available on ethnicity for 97% (n=69/71) TB cases in 2017. The highest proportion of cases were of white ethnicity (62%, n=43/69), with eight of these cases born outside the UK/Ireland.

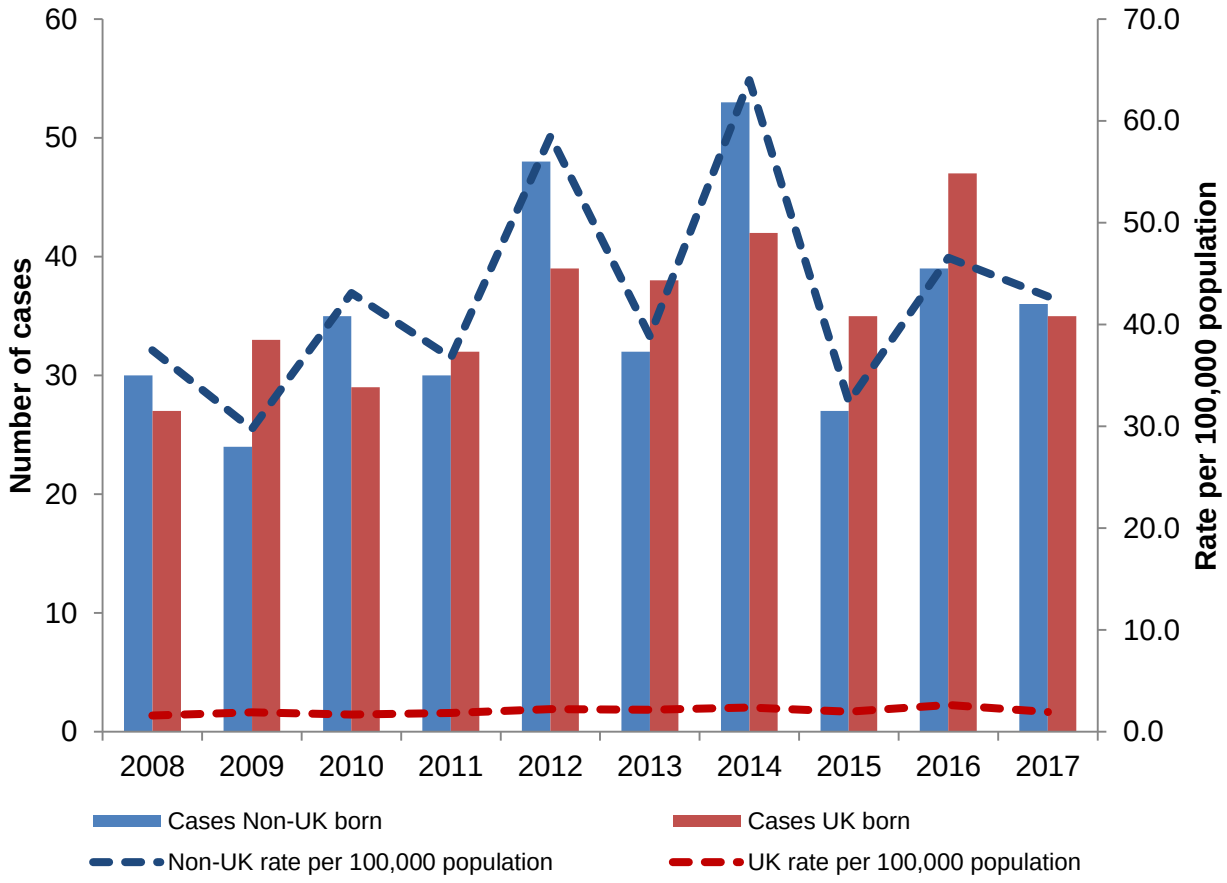


Figure 6: ***Northern Ireland numbers and rate per 100,000 of UK-born and Non-UK born tuberculosis case reports, 2008-2017***

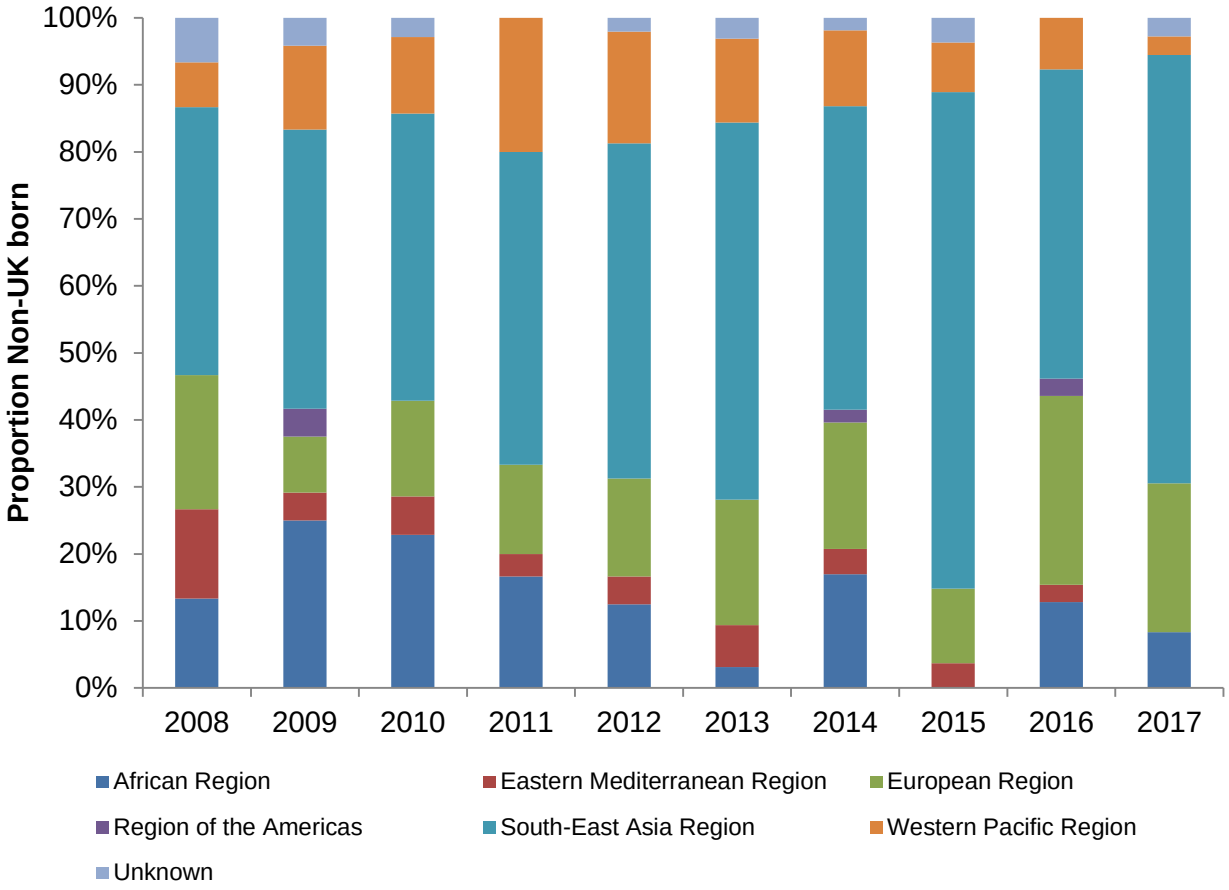


Figure 7: ***Non-UK born tuberculosis reports in Northern Ireland by WHO region, 2008-2017***

Time from entry to UK to diagnosis

Time from entry into Northern Ireland until TB diagnosis was known for 75% (n=27/36) of cases born outside the UK/Ireland in 2017. Of these, 44% (n=12/27) were diagnosed within two years of entry; 37% (n=10/27) were diagnosed between three and nine years of entry; and the remaining 19% (n=5/27) had been in Northern Ireland for ten years or more before diagnosis.

Social risk factors

In 2017, there were ten (14%) TB cases with reported social risk factors. The risk factors associated with the cases were reported as being homeless and/or a history of alcohol misuse/abuse and/or history of drug misuse/abuse and/or were in prison in the last five years. However, non-reporting of risk factors may not be indicative of there being no risk factors existing; therefore it is difficult to ascertain the true incidence.

Clinical Characteristics

In 2017, 65% (n=46/71) of cases had a pulmonary component, an increase compared with 2016, when 57% of cases had pulmonary disease.

The rate of pulmonary TB cases in Northern Ireland in 2017 was 2.5 per 100,000 population, similar to the rate in 2016 (2.6 cases per 100,000 population). The rates of non-pulmonary disease in the region decreased from 2.0 cases per 100,000 in 2016 to 1.3 per 100,000 in 2017 (Figure 8).

Figure 8: ***Rates of pulmonary and non-pulmonary tuberculosis, Northern Ireland, 2008-2017***

Site of disease-Pulmonary

In 2017, 69% (n=24/35) of cases born in the UK/Ireland had pulmonary disease, which is similar to the proportion of cases in 2016 (68%). The proportion of pulmonary disease in

those born outside the UK/Ireland increased from 44% in 2016 to 61% (n=22/36) in 2017 (Figure 9).

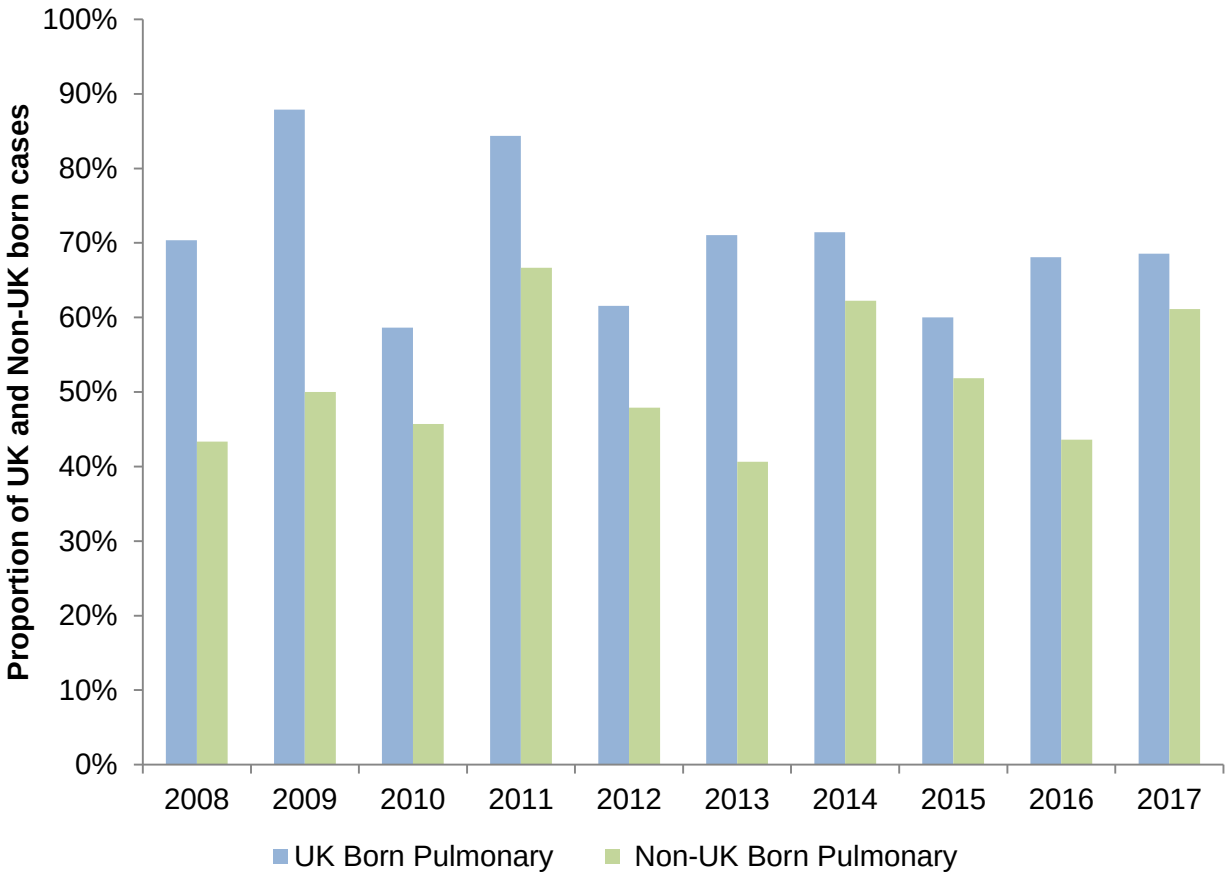


Figure 9: ***Proportion of UK and Non-UK born tuberculosis cases pulmonary in Northern Ireland 2008-2017***

Pulmonary disease rates decreased in all age groups in 2017 compared with 2016, with the exception of the 15-44 year age group in which the rate of pulmonary disease increased from 1.9 to 2.9 cases per 100,000. In males the highest rate of pulmonary TB occurred in those aged 15-44 years at 4.2 per 100,000 population. Pulmonary disease rates were lower in females than males. The highest rate in females was in those aged 45-64 years, at 2.5 per 100,000 population (Figures 10 and 11).

Figure 10: ***Pulmonary age-specific disease rates in males in Northern Ireland, 2008-2017***

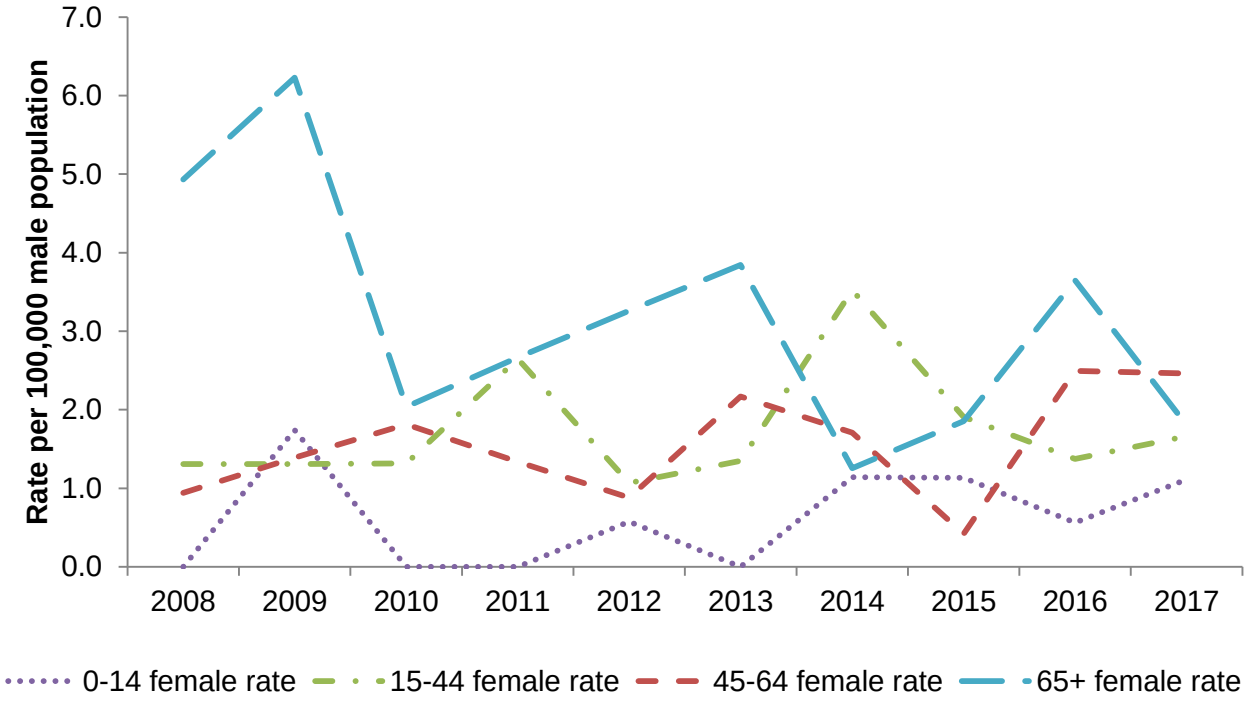


Figure 11: ***Pulmonary age-specific disease rates in females in Northern Ireland, 2008-2017***

Similar to last year, the SHSCT had the highest rate of TB with a pulmonary component in 2017 at 4.7 cases per 100,000 population. Pulmonary TB accounted for 67% (n=18/27) of all TB cases reported in SHSCT (Figure 12). The BHSCT had the highest proportion of pulmonary cases in 2017, with 77% (n=10/13) of all cases in this Trust having a pulmonary component, five of these ten cases were born in the UK/Ireland (Figure 12).

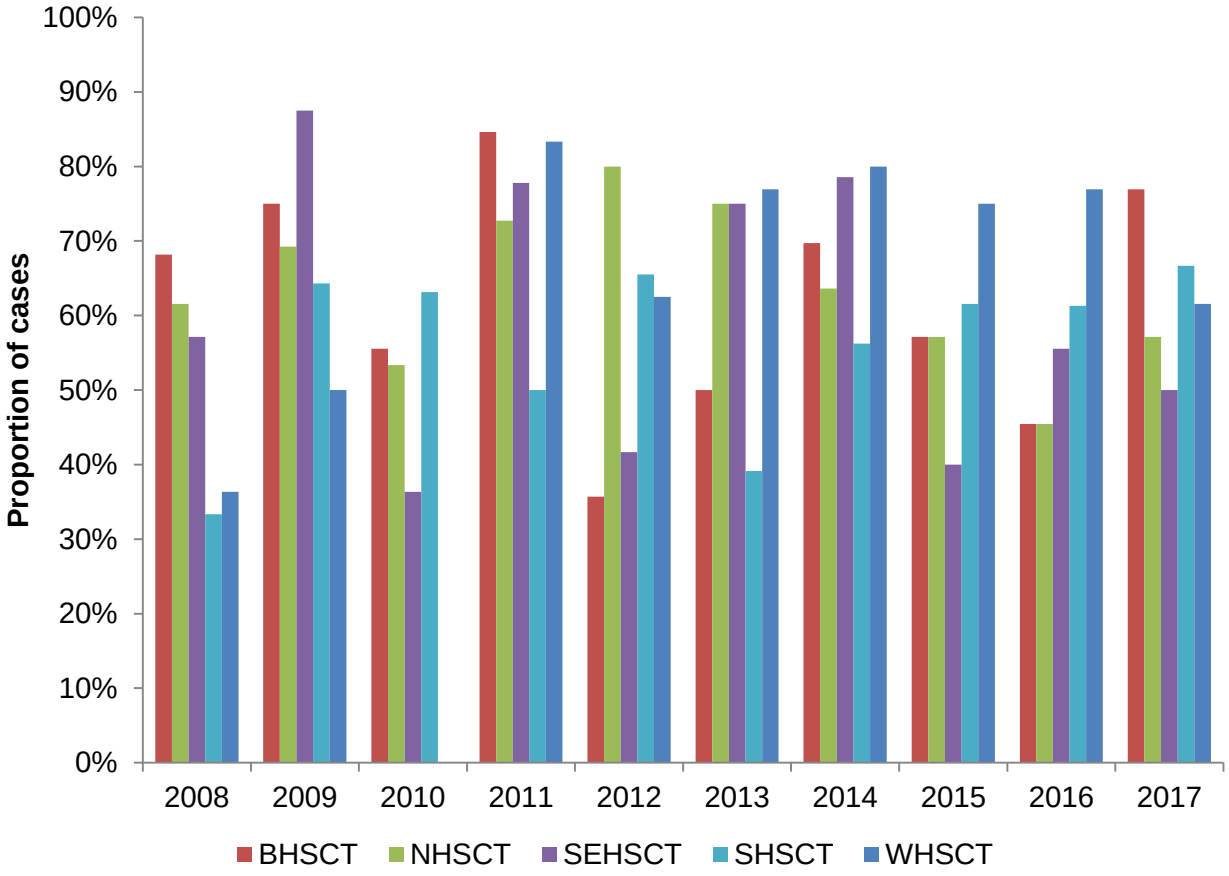
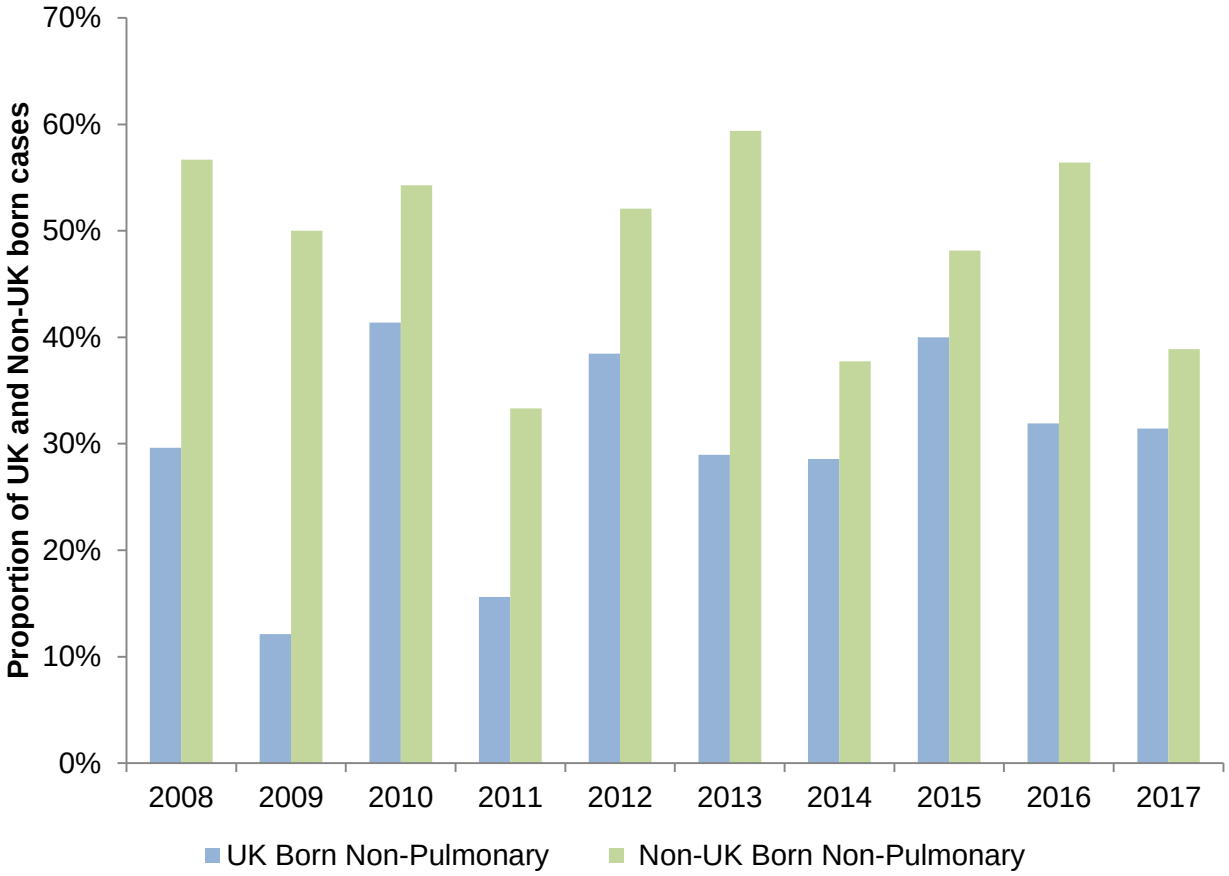


Figure 12: ***Proportion of TB cases in Northern Ireland HSCTs with pulmonary infection, 2008-2017***

Site of disease - Non-pulmonary

Of the 71 cases notified in 2017, 25 cases were diagnosed with non-pulmonary TB (35% of all cases notified), which is lower than the proportion in 2016 (43%). The proportion of cases born outside the UK/Ireland that presented with non-pulmonary TB decreased this year from 56% in 2016 to 39% (n=14/36) in 2017 (Figure 13).



*** Cases only included where place of birth was known*

Figure 13: *Proportion of UK and Non-UK born tuberculosis cases Extra-pulmonary in Northern Ireland 2008-2017*

Of the 25 non-pulmonary cases of TB notified during 2017, 13 cases were male and 12 were female. The average age of non-pulmonary disease cases was slightly older at 49.2 years compared to pulmonary disease cases at 46.1 years. The highest age-specific rate of non-pulmonary cases in both males and females in 2017 occurred in those aged 65 years and older, at 2.2 and 3.0 per 100,000 population, respectively (Figures 14 and 15).

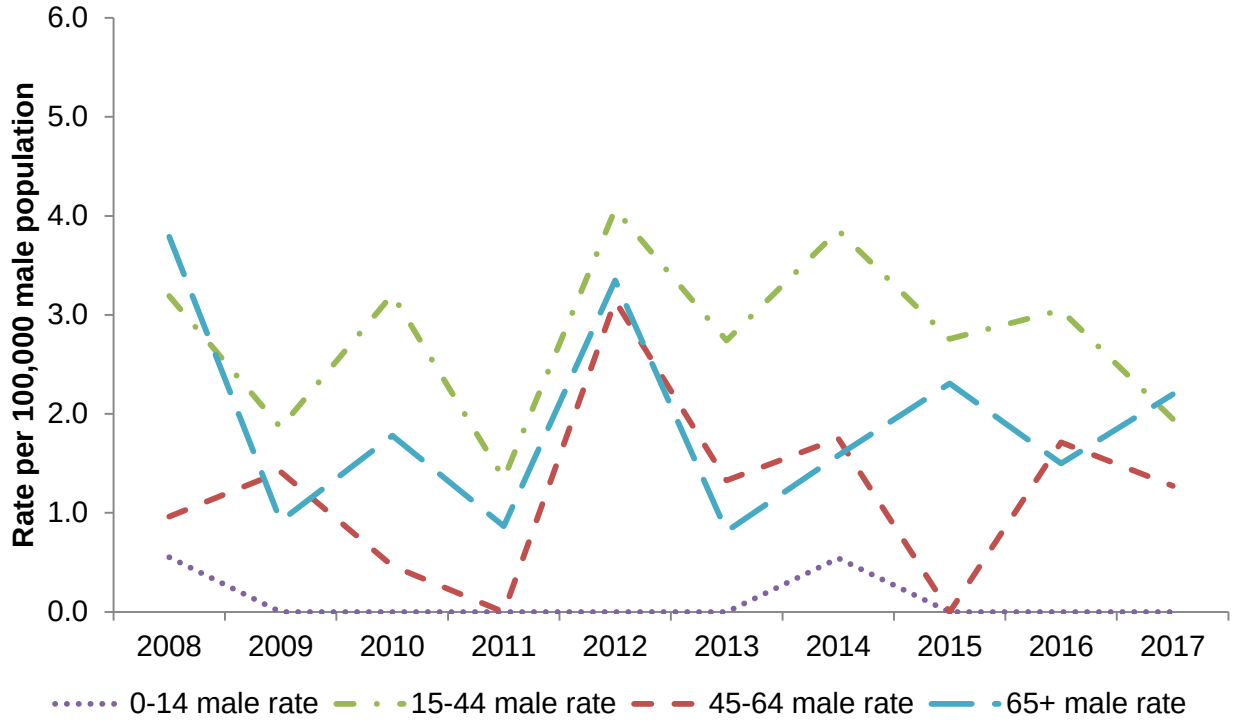


Figure 14: ***Non-pulmonary age-specific rates in males in Northern Ireland, 2008-2017***

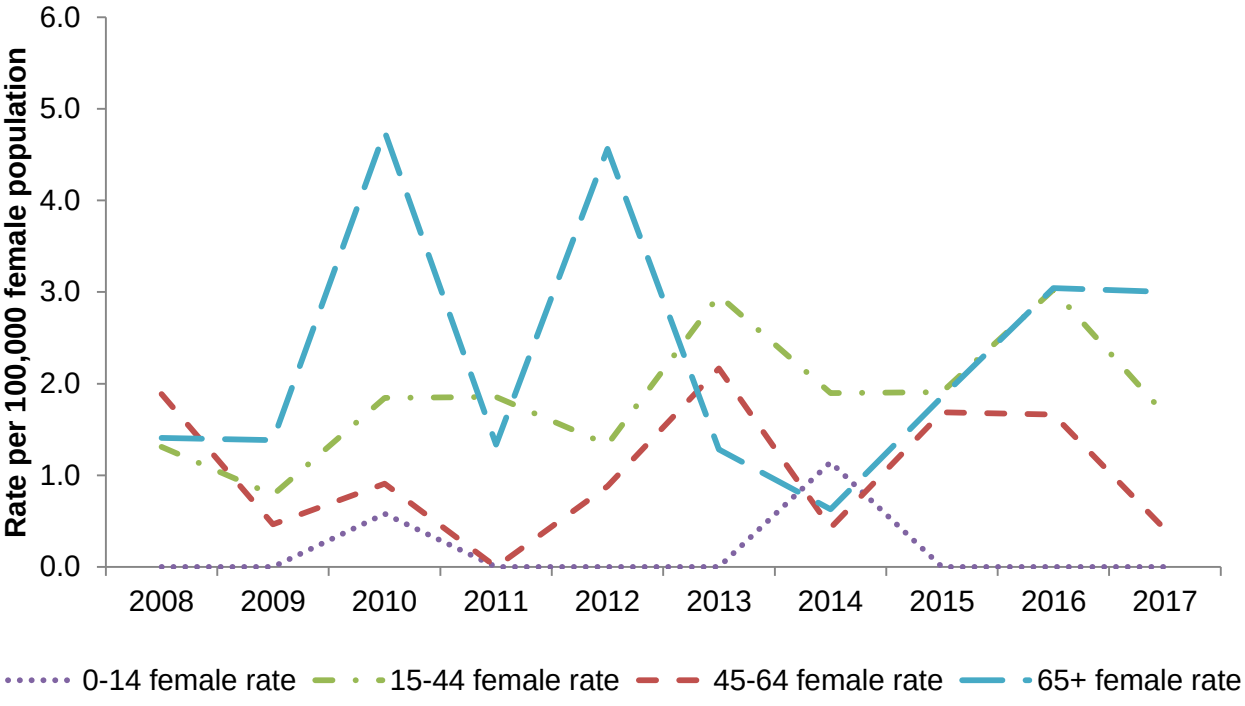


Figure 15: ***Non-pulmonary age-specific rates in females in Northern Ireland, 2008-2017***

SHSCT had the highest rate of extra-pulmonary TB at 2.4 cases per 100,000 population and accounted for 33% (n=9/27) of all TB cases reported in this Trust in 2017 (Figure 16).

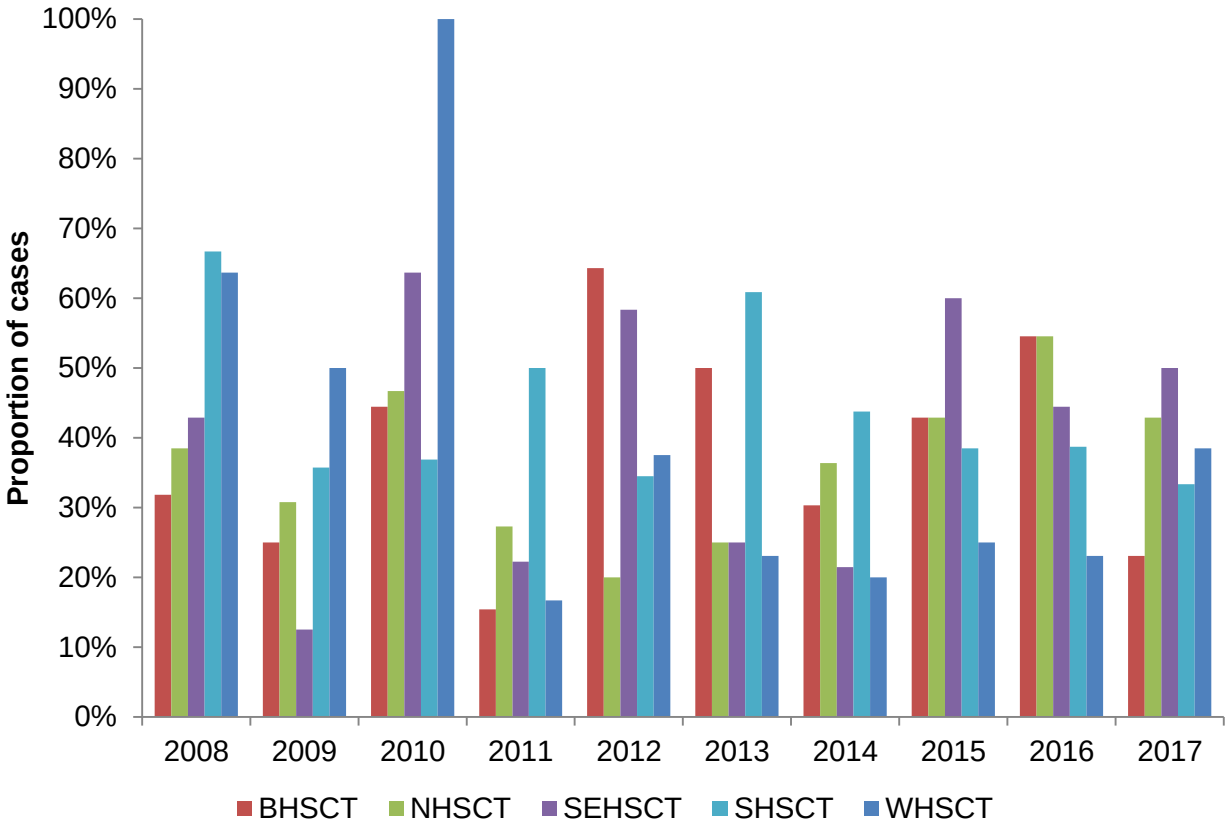


Figure 16: ***Proportion of TB cases in Northern Ireland HSCT's with non-pulmonary infection, 2008-2017***

The site(s) of disease for the tuberculosis cases in 2017 is available in Table 1.

Table 1: ***Tuberculosis case reports by site of disease, Northern Ireland, 2017***

Site of Disease	Number of cases	Proportion of all cases
Pulmonary	46	65%
Extra-thoracic lymph nodes	14	20%
Intra-thoracic lymph nodes	9	13%
CNS meningitis	3	4%
Gastrointestinal	3	4%
Pleural	7	10%
Miliary	1	1%
Bonejoint-spine	3	4%
Genitourinary	1	1%
Bonejoint-other	1	1%
CNS other	0	0%
Cryptic disseminated	1	1%
Laryngeal	0	0%
Other extra pulmonary	2	3%

Note: Total percentage exceeds 100% due to infections at more than one site.

Previous diagnosis of tuberculosis

In 2017 three cases reported a previous history of TB. All of these cases had pulmonary disease and two of the three cases were born outside the UK/Ireland.

Time symptomatic

The time between onset of symptoms and starting treatment was known for 59 (83%) cases in 2017. Of the 59 cases: 24% (n=14) were treated within two months of onset of symptoms with a median time frame of 30 days (IQR 25-39); an additional 25% (n=15) of cases were treated within two to four months of onset with a median time period of 87 days (IQR 75-95); and the remaining 51% (n=30) of cases reported a treatment period from onset of symptoms greater than four months with a median time period of 227 days (IQR 171-277).

The time between onset of symptoms and starting treatment was known for 39 (85%) of the 46 pulmonary cases in 2017. The overall median time period from onset of symptoms to treatment was 131 days (IQR 65-225). This period was higher than for non-pulmonary cases where the median time period from onset to treatment was 103 days (IQR 71-227) (Table 2).

Table 2: *Time between onset of symptoms and start of treatment (days)*

All cases	**Number**	**Median**	**IQR**
0-2 months	14	30	25-39
2-4 months	15	87	75-95
>4 months	30	227	171-277
All	***59***	***128***	***65-227***
Pulmonary cases			
0-2 months	9	26	20-35
2-4 months	9	89	73-95
>4 months	21	216	165-266
All pulmonary	***39***	***131***	***65-225***
Non-pulmonary			
0-2 months	5	37	27-44
2-4 months	6	87	82-89
>4 months	9	245	208-616
All non-pulmonary	***20***	***103***	***71-227***

Microbiology

In 2017, 65% (n=46/71) of TB cases were culture confirmed, the same proportion as in 2016. Of the 46 isolates culture confirmed, 42 were identified as having *Mycobacterium tuberculosis* infection, two as *Mycobacterium tuberculosis complex (MTBC),* one as *Mycobacterium africanum*, and one as *Mycobacterium bovis*. The additional 25 cases were notified on the basis of clinical or non-culture diagnosis and response to anti-tuberculosis therapy. Of these 30 cases, seven (28%) were confirmed by histology.

Of the 46 pulmonary cases in 2017, 67% (n=31) were culture positive. Sputum smear results were known for 34 (74%) of the 46 pulmonary infection cases. 19 (41%) pulmonary cases were sputum smear positive at notification, of which all were confirmed by culture. An additional 15 (33%) pulmonary infection cases were sputum smear negative of which six were later confirmed by culture as *M. tuberculosis* and one as *M. africanum.* Of the 12 (26%) pulmonary cases where sputum smear status was not known or not done, eight were culture confirmed (Table 3).

Table 3: *Pulmonary, culture positive and sputum smear positive tuberculosis cases, Northern Ireland, 2008-2017*

Year	Pulmonary Cases	Culture Positive (%)	Culture and Sputum Smear Positive (%)
2008	36	83%	39%
2009	42	86%	31%
2010	34	97%	59%
2011	47	81%	40%
2012	47	77%	36%
2013	42	67%	29%
2014	63	68%	35%
2015	35	83%	37%
2016	49	78%	35%
2017	46	67%	41%
Total	**441**	**78%**	**38%**

Table 4.*Non-Pulmonary, culture positive tuberculosis cases, Northern Ireland, 2008-2017*

Year	Non-Pulmonary Cases	Culture Positive (%)
2008	30	70%
2009	17	76%
2010	32	69%
2011	15	67%
2012	40	45%
2013	32	53%
2014	32	66%
2015	27	41%
2016	37	46%
2017	25	60%
Total	**287**	**57%**

Drug resistance

Isoniazid, rifampicin, ethambutol and pyrazinamide are first-line drugs for treatment of TB in the UK. Drug susceptibility test results were available for all 46 culture confirmed cases of TB in Northern Ireland in 2017.

In 2017, there was one multi-drug resistant case of TB recorded with one additional TB case resistant to Isoniazid at the start of treatment, representing 4% of all culture confirmed cases. One of the two cases was born outside the UK/Ireland and this case also had a previous diagnosis of TB. The one *M. bovis* case was also resistant to pyrazinamide (Figure 17).

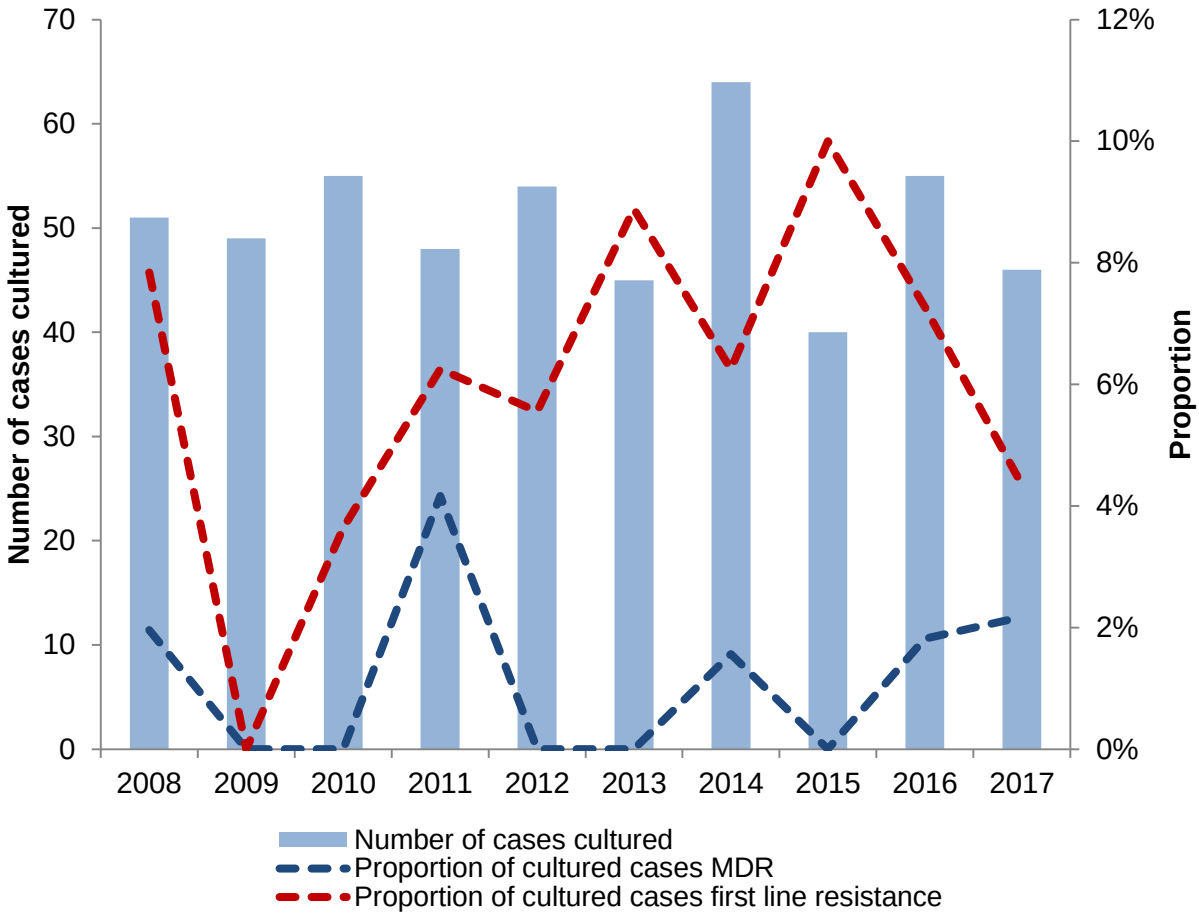


Figure 17: ***Number and proportion of drug resistant cases of tuberculosis in Northern Ireland, 2008-2017***

Treatment Outcomes

TB patient outcomes are reported a year after treatment commences and in accordance with the World Health Organization (WHO) treatment outcome definitions[1]. Under these definitions, treatment outcome at 12 months reporting is defined as all TB cases, diagnosed in 2016 with drug sensitive TB, excluding those with rifampicin resistant TB or MDR-TB. In this report, treatment outcomes for drug sensitive TB cases are reported separately for the following groups:

Cohort 1: For cases with an expected duration of treatment less than 12 months, treatment outcomes at 12 months (excluding Rifampicin and multi-drug resistance).

Cohort 2: For cases with an expected duration of treatment less than 12 months, excluding Rifampicin and multi-drug resistance AND cases with CNS, spinal, cryptic disseminated or miliary disease.

TB treatment outcomes for cases notified from 2008 to 2016 under these definitions have been calculated to allow for trends to be monitored (Figure 18).

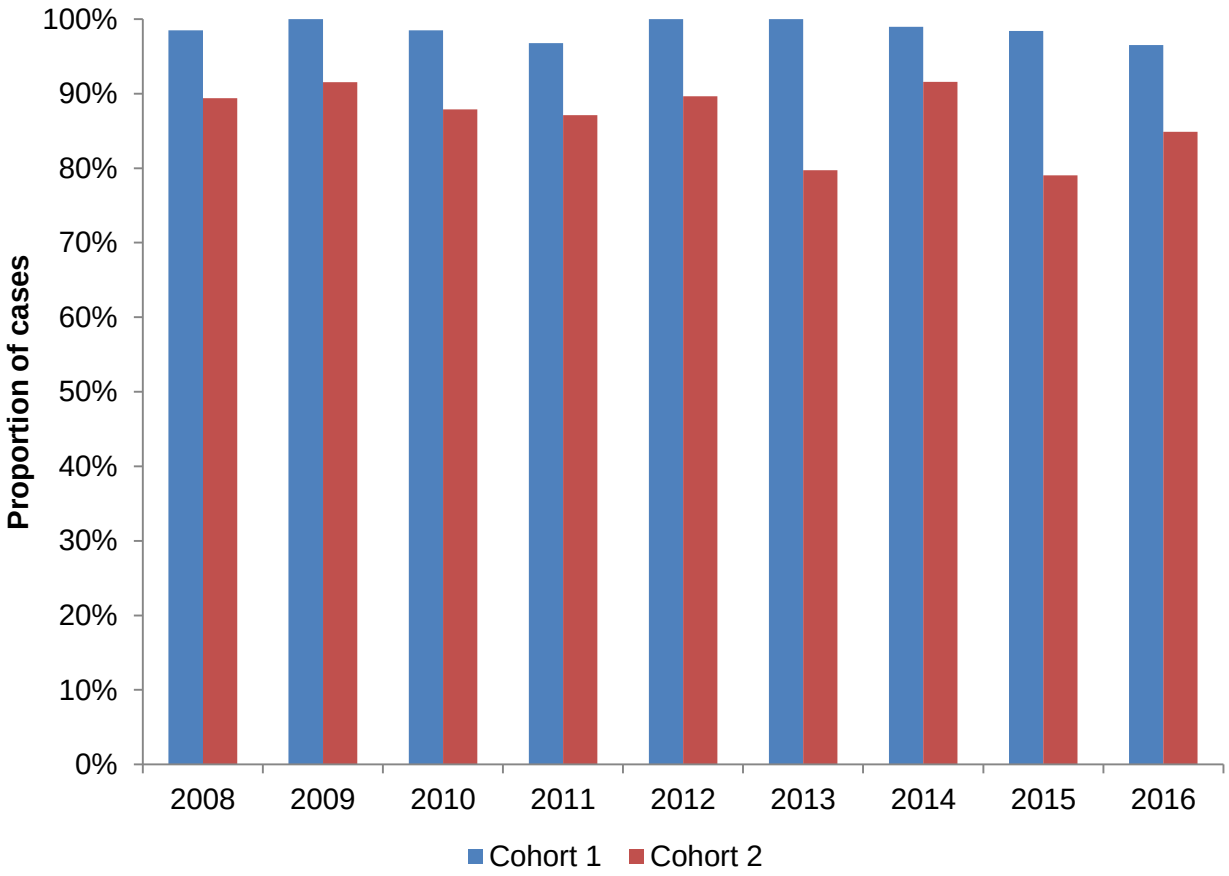


Figure 18: *Tuberculosis treatment outcomes for cases under the* WHO treatment outcome definitions, *2008-2016*

In 2016, 86 TB cases were notified in Northern Ireland; there were two cases recorded as being resistant to rifampicin and one case that was multi-drug resistant. Thus 83 cases are included in cohort 1. A further 10 cases had CNS, spinal, miliary or cryptic disseminated disease and are excluded from the outcomes presented in cohort 2 (Table 5).

Table 5: Outcome of cohorts 1 and 2 2016 TB cases

Outcome	Cohort 1 (n=83)	%	Cohort 2 (n=73)	%
Completed	64	77%	57	78%
Died	8	10%	7	10%
Lost to Follow up	2	2%	2	3%
Still on Treatment	5	6%	4	5%
Stopped	1	1%	1	1%
Not evaluated*	3	4%	2	3%
Total	83	100%	73	100%

*transferred out/not TB/unknown/missing

In cohort 1, the proportion of cases who completed treatment within 12 months was 77% (n=64/83), compared with 82% (n=50/61) in 2015 (Figure 19).

Of the 64 cases who completed treatment within 12 months, 35 cases were born in the UK (55%) and 29 cases were non-UK born (45%). The proportion of females and males completing at 12 months was the same (32 male, 50% and 32 females, 50%).

In cohort 2, the proportion of cases who completed treatment within 12 months was 78% (n=57/73), compared with 88% (n=43/49) in 2015 (Figure 19).

Of the 57 cases who completed treatment within 12 months, 26 cases were born in the UK (60%) and 17 cases were non-UK born (40%). The proportion of females and males completing at 12 months was similar (21 males, 49% and 22 females, 51%).

Eight patients died in 2016 giving a case-fatality rate (CFR) of 9.6%, which is above the 10 year average (2007-2016) of 7.6% (Figure 19). One case was diagnosed post-mortem. Six cases were UK born and two were non-UK born. The average age of those who died was 59 years with an age-range from 19-88 years.

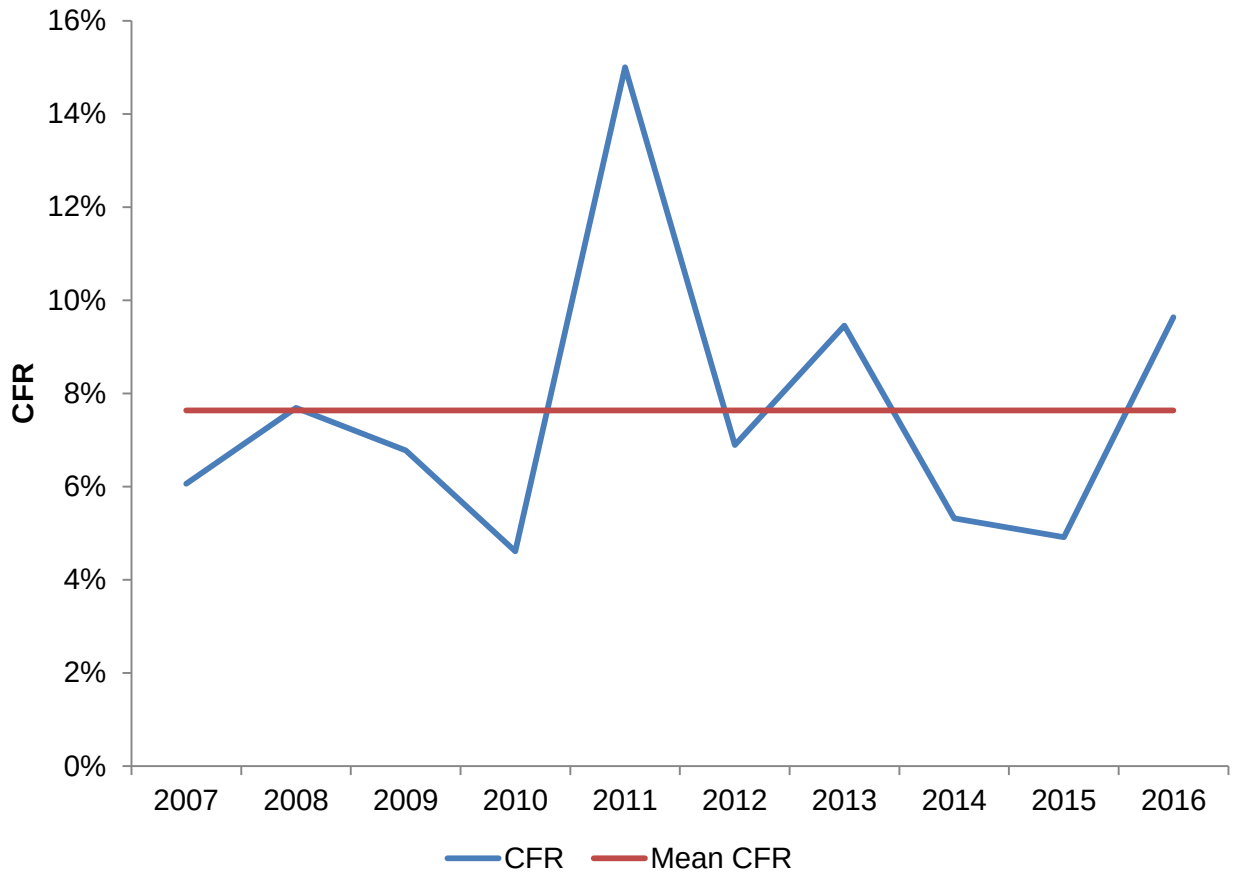


Figure 19: ***Case-Fatality Rate of tuberculosis notifications, Northern Ireland 2007-2016.***

Discussion

The incidence of TB in Northern Ireland remains relatively low at 3.8 cases per 100,000 population. Although the rate of the disease decreased by 17% compared to 4.6 cases per 100,000 population in 2016, the rate has increased by 15% compared to 2015 (3.3 per 100,000). Relatively small differences in the number of cases can give rise to substantial percentage changes due to small numbers and considerable year to year variation. While lower than England (9.2 per 100,000), Scotland (5.3 per 100,000) and the Republic of Ireland (6.7 per 100,000), Northern Ireland rates of TB were higher than Wales (3.4 per 100,000)[2,3,4,5].

In 2017, as in previous years, the rate of TB was highest in the SHSCT area at 7.1 cases per 100,000 population, however the rate in this HSCT has decreased by 13% from 8.2 per 100,000 in 2016.

Patients aged 15-44 years accounted for the majority of cases (48%) whilst the rates of TB were highest in those aged 65 years and over at 5.3 cases per 100,000 population (accounting for 23% of cases). TB rates decreased among all age groups in 2017 compared to 2016. In 2017 3% of TB cases occurred in children aged 0-14 years showing evidence of transmission of the disease occurring, similar to that reported in 2015 and 2016.

TB rates in the UK-born population remain low and stable at 2.0 cases per 100,000 population in 2017. The highest rates of TB continue to be reported in those born outside the UK/Ireland at 42.8 per 100,000 population in 2017, however this rate has decreased from 46.5 per 100,000 in 2016. In 2017, 51% of all TB cases in Northern Ireland occurred in individuals born outside of the UK/Ireland, with the majority originating from South-East Asia (66%).

In 2017, 65% of TB cases had a pulmonary component. The rate of pulmonary TB in Northern Ireland in 2017 (2.5 cases per 100,000 population) remains similar to that in 2016, whilst the rate of non-pulmonary TB has decreased from 2.0 to 1.3 cases per 100,000 in 2017.

ECDC targets[6] recommend that at least 80% of pulmonary TB cases be culture confirmed in order to have optimal detection of infectivity and drug resistance. In 2017, 67% of pulmonary cases were culture confirmed in Northern Ireland.

The proportion of cultured cases of TB with first line drug resistance in 2017 was 4%, a decrease from 2016 when 7% showed resistance. There was one multi-drug resistant case reported in 2017. The proportion of drug sensitive TB cases expected to complete treatment by 12 months is an indicator of the quality of TB services. In 2016, 78% of drug sensitive cases completed treatment in this time frame.

The overall median time period from onset of symptoms to starting treatment for pulmonary cases was 131 days (39 cases, IQR 65-225). This suggests a significant number of pulmonary cases still have a substantial delay before treatment, increasing the likelihood of infectivity. While we do not know the reasons behind the delay it highlights the need to continue raising awareness of TB.

Eight TB patients died in 2016, giving a CFR of 9.6% which is above the 10 year average (2006-2016) of 7.6%.

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