

Annual Epidemiological Report

March 2018

National TB surveillance in Ireland, 2017

Key Facts

- 321 TB cases were notified to HPSC corresponding to a crude incidence rate (CIR) of 6.7
- HSE East reported the highest number of cases at 175 (54.5% of total) and CIR of 10.2
- The male to female ratio was 1.3:1
- The highest age-specific rate (ASIR) occurred in those aged 65 years and over (10.7) and the lowest ASIR was in the 0-14 years age group (0.9)
- 45.2% of cases were born in Ireland (CIR of 3.7) and 43.0% were foreign born (CIR of 17.0) while 11.8% did not report country of birth
- One case of TB meningitis due to *M. bovis* was notified
- 210 cases (65.4%) were culture positive, 21 (6.5%) were culture negative and 7 (2.2%) were reported as not having been culture tested. Culture result was not reported for the remaining 83 cases (25.9%).
- *M. tuberculosis* was isolated in 204 (97.1%), *M. tuberculosis* complex in 4 (1.9%) and *M. bovis* in 2 (1.0%)
- Amongst culture positive cases, 188 (89.5%) had drug sensitivity details
- Resistance was reported in 19 cases, including 2 multidrug resistant (MDR-TB) cases and 2 extensively drug resistant (XDR-TB) cases
- HIV status was reported for 96 TB cases (29.9%), 14 (14.6%) of whom tested positive for HIV and 82 (85.5%) tested negative for HIV
- Two TB outbreaks were reported during this period

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Background

This 2017 TB report presents an epidemiological summary of the cases of tuberculosis (TB) notified to eight HSE areas in Ireland during the period 1st January to 31st December 2017. Further information on TB is available at www.hpsc.ie.

Methods

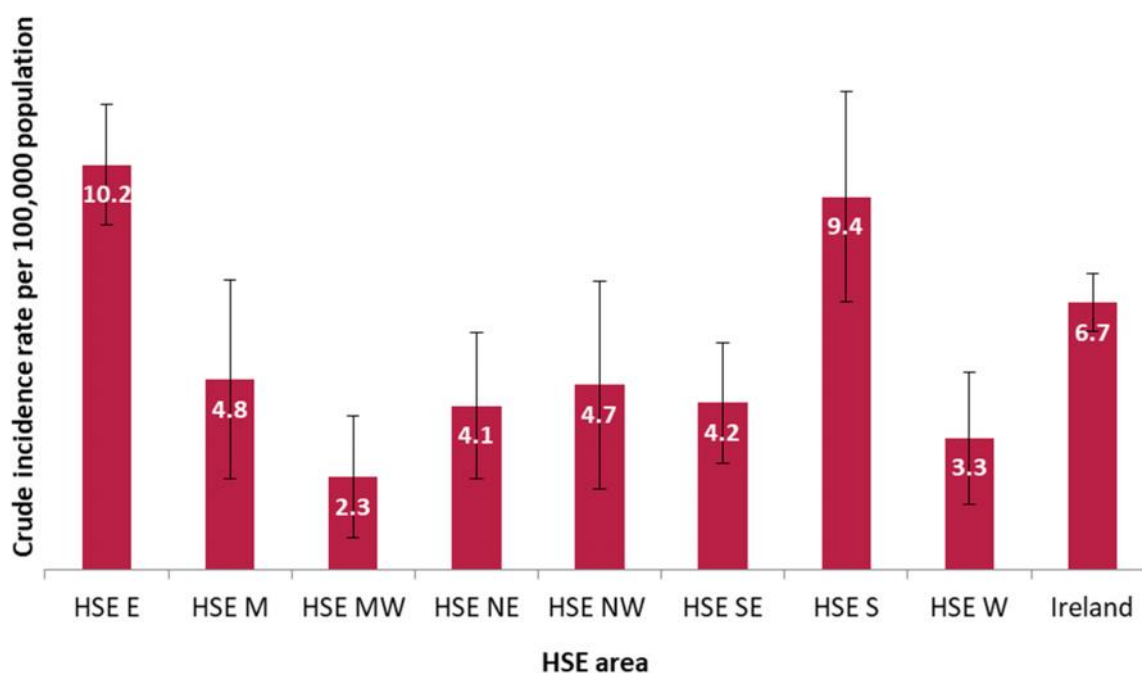
Enhanced TB notification forms are completed by public health doctors for each case of TB notified. These forms summarise all available clinical, microbiological, histological and epidemiological data. Forms are then collated in the regional departments of public health and entered onto the Computerised Infectious Disease Reporting (CIDR) system. HPSC produces a quarterly TB report using notification data reported by HSE areas to the CIDR system. Data were extracted from CIDR on 14/03/2017.

Results

Total cases of tuberculosis notified in Q1-4 2017

There were 321 cases of TB notified during this period. The crude incidence rate (CIR) by HSE area is shown in figure 1 while the number of cases notified in each HSE area and Local Health Area (LHO) is reported in table 1. The CIR in HSE-E was significantly higher than the national rate while the CIR in HSE-MW, -SE and -W was significantly lower than the national CIR. Figure A1, appendix 1 displays the annual number of TB notifications, 3 year moving average and crude incidence rate.

Figure 1: TB crude incidence rate* by HSE area, 2017



* Error bars represent 95% confidence intervals of the crude incidence rate

Table 1: Number and percentage of TB notifications by HSE area, Q1-4 2017

HSE Area	Number of TB cases	% of Total	Local Health Office	Number of TB cases
East	175	54.5	Dublin South	10
			Dublin South East	14
			Dublin South City	19
			Dublin South West	16
			Dublin West	23
			Dublin North West	28
			Dublin North Central	23
			Dublin North	16
			Kildare/West Wicklow	19
			Wicklow	7
Midland	14	4.4	Longford/Westmeath	10
			Laois/Offaly	4
Mid-West	9	2.8	Clare	4
			Limerick	4
			Tipperary N/ E Limerick	1
North East	19	5.9	Cavan	4
			Louth	4
			Meath	10
			Monaghan	1
North West	12	3.7	Donegal	6
			Sligo/Leitrim	6
South	48	15.0	Kerry	8
			North Cork	8
			North/South Lee	27
			West Cork	5
South East	29	9.0	Carlow/Kilkenny	8
			Tipperary S	8
			Waterford	7
			Wexford	6
West	15	4.7	Galway	8
			Mayo	5
			Roscommon	2
Ireland	321	100.0	Total	321

Age and sex distribution

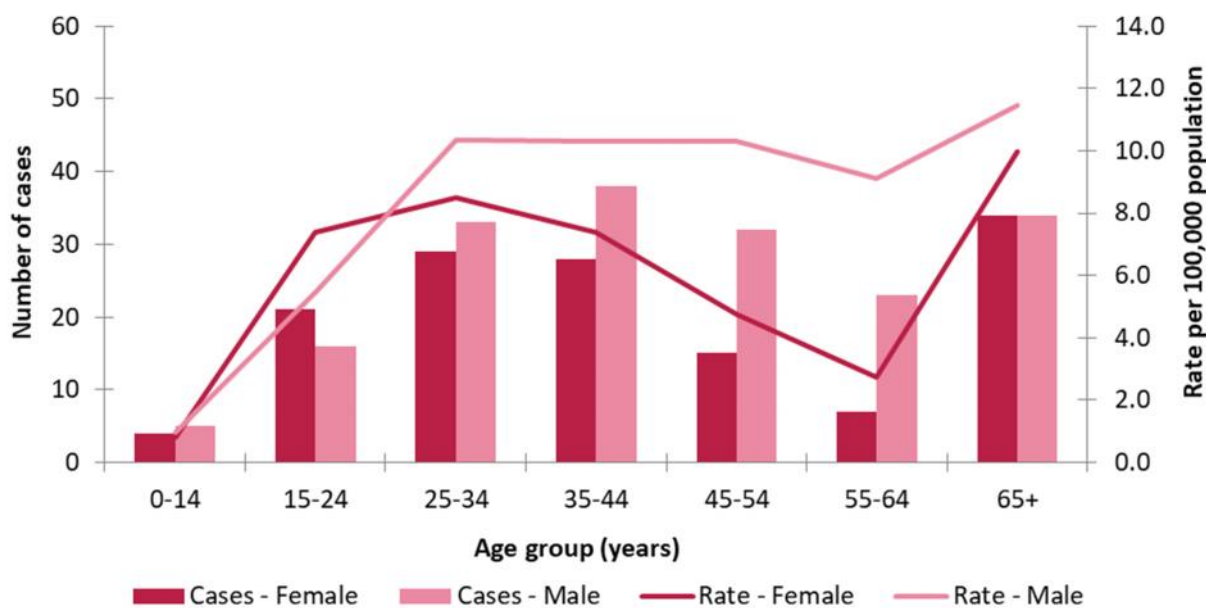
A breakdown of cases by age group and HSE area is shown in table 2 while figure 2 shows the age and sex specific incidence rates for 2017 and figure 3 displays the trend in the 0-14 year age group by year.

There were 139 females (43.3%) and 182 males (56.7%), corresponding to a male to female ratio of 1.3:1.

Table 2: Number and percentage of TB notifications by age group and HSE area, Q1-4 2017

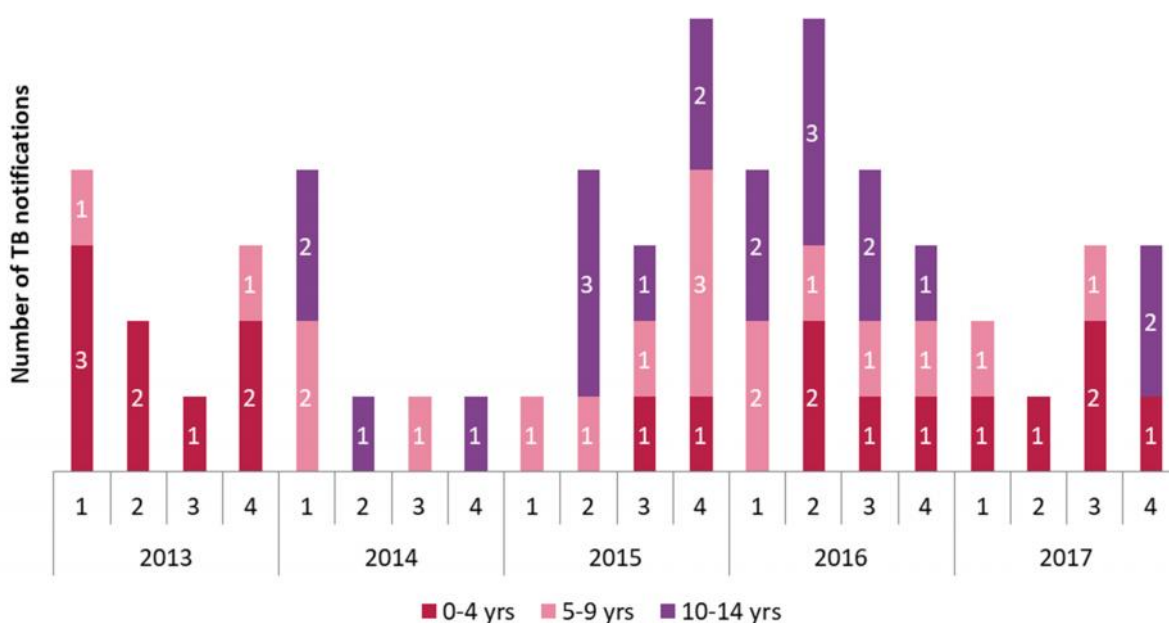
Age group (years)	HSE-E	HSE-M	HSE-MW	HSE-NE	HSE-NW	HSE-SE	HSE-S	HSE-W	Total	% Total
0-4	5								5	1.6
5-9	1			1					2	0.6
10-14	1							1	2	0.6
15-19	8		1	2		2	2	1	16	5.0
20-24	11	1	1			1	5	2	21	6.5
25-34	38	2	2	3	1	3	9	4	62	19.3
35-44	35	4	1	3	2	8	11	2	66	20.6
45-54	24	3	1	5	3	4	5	2	47	14.6
55-64	17	2		4		3	3	1	30	9.3
65+	33	2	3	1	6	8	13	2	68	21.2
Unk	2	0	0	0	0	0	0	0	2	0.6
Total	175	14	9	19	12	29	48	15	321	100.0

Figure 2: Number of notifications and age specific rate by sex, 2017



During 2017, nine cases were reported in the 0-14 year age group, four of whom were born in Ireland. Risk factors reported in this age group included being a contact of a case of TB (n=4) and being born in a country of high endemicity (n=1). Three cases reported BCG status, two of whom were unvaccinated and one was vaccinated. Vaccination status for the remaining six cases was unavailable.

Figure 3: Number of notifications in 0-14 year age group by quarter and year



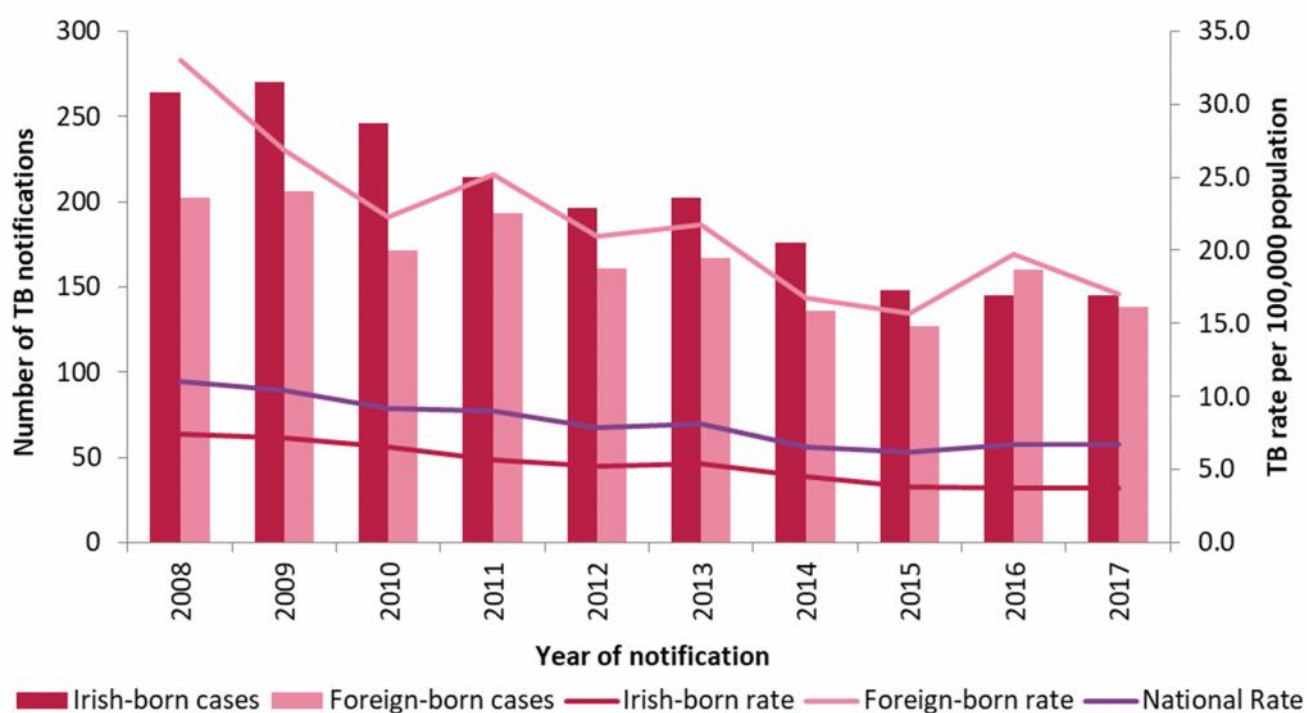
Country of origin

Of the 321 cases reported during this period, 145 (45.2%) were born in Ireland and 138 (43.0%) were born outside Ireland. Country of birth was not reported for 38 (11.8%) cases. Of the 138 cases born outside Ireland, 13 (9.4%) were reported as asylum seekers or refugees (five from HSE-E, three from HSE-SE, two each from HSE-M and –S, one from HSE-W). Table 3 summarises the regions of origin of cases, figure 34 shows the annual number of TB cases and crude incidence rate by geographic origin.

The highest age specific rates (ASIRs) among Irish-born TB cases were in those aged 65 years and older, while the highest rates in foreign-born cases were aged between 15-44 years old (table 4).

Table 3: TB notifications by region of origin, Q1-4 2017

Region of origin	Number	%
Ireland	145	45.2
Central Europe	8	2.5
Eastern Asia / Pacific	4	1.2
Eastern Europe	27	8.4
North Africa / Middle East	2	0.6
South America	3	0.9
South Asia	52	16.2
Sub-Saharan Africa	35	10.9
Western Asia	1	0.3
Western Europe	6	1.9
Country of birth not reported	38	11.8
Total	321	100.0

Figure 4: Number of TB notifications and crude incidence rate by geographic origin and year**Table 4: TB notifications age group and geographic origin, Q1-4 2017**

Age group (years)	Cases - Irish born	Rate - Irish born	% Irish	Cases - Foreign born	Rate - Foreign born	% Foreign	Country of birth unk	Total
0-14	5	0.5	55.6	2	2.7	22.2	2	9
15-24	12	2.6	32.4	22	20.8	59.5	3	37
25-34	10	2.2	16.1	45	24.2	72.6	7	62
35-44	21	3.8	31.8	41	21.3	62.1	4	66
45-54	23	4.8	48.9	17	12.4	36.2	7	47
55-64	20	4.6	66.7	6	9.1	20.0	4	30
65+	53	9.2	77.9	4	8.3	5.9	11	68
Age unk	1			1				2
All ages	145	3.7	45.2	138	17.0	43.0	38	321

Diagnostic categories

Cases are classified into one of three diagnostic categories based on the site of disease. Extra-pulmonary disease components were reported in 119 cases (37.1%). One case of TB meningitis was reported during this period. Table 5 summarises the diagnostic type for each HSE area while table 6 reports the extrapulmonary site of disease for cases with an extrapulmonary component.

Table 5: Number and percentage of TB notifications by diagnostic type and HSE area, Q1-4 2017

HSE area	Pulmonary	Pulmonary & extrapulmonary (P+E)	Extrapulmonary	Not reported	Total
HSE-E	107	15	47	6	175
HSE-M	11	0	2	1	14
HSE-MW	6	1	2	0	9
HSE-NE	11	0	5	3	19
HSE-NW	7	1	4	0	12
HSE-SE	9	3	17	0	29
HSE-S	31	1	16	0	48
HSE-W	9	1	4	1	15
Total	191	22	97	11	321
%	59.5	6.9	30.2	3.4	100.0

Table 6: Number and percentage of TB notifications by extrapulmonary site of disease, Q1-4 2017

Extrapulmonary sites	Number of TB cases	% Total
Lymphatic extrathoracic	34	28.6
Pleural	22	18.5
Lymphatic intrathoracic	14	11.8
Genito-urinary	8	6.7
Bone/joint other than spine	7	5.9
Peritoneal/digestive	6	5.0
Disseminated	2	1.7
Spine	2	1.7
CNS	1	0.8
Meningitis	1	0.8
Other	12	10.1
Unknown	1	0.8
Not reported	9	7.6
Total	119	100.0

Microbiological results:

Sputum-smear status – at initial diagnosis

Of the 213 cases with a pulmonary component reported, 82 (38.5%) were sputum smear positive at diagnosis. Of the smear positive cases, 42 (51.2%) reported a second sputum smear positive result.

Culture – sample and isolates at initial diagnosis

Of the 321 cases reported during this period, 210 cases (65.4%) were culture positive, 21 (6.5%) were culture negative and seven (2.2%) were reported as not having been culture tested (table 7). Culture result was not reported for the remaining 83 cases (25.9%). Of the 210 culture positive cases, *M. tuberculosis* was isolated in 204 (97.1%), *M. tuberculosis* complex in four (1.9%) and *M. bovis* in two (1.0%)

Table 7: Number and percentage of TB notifications by first culture result and HSE area, Q1-4 2017

Culture	HSE E	HSE M	HSE MW	HSE NE	HSE NW	HSE SE	HSE S	HSE W	Total	% Total
Culture positive	105	11	8	14	8	20	33	11	210	65.4
Culture negative	4	3			3	3	6	2	21	6.5
Not done	2		1			3		1	7	2.2
Not reported	64			5	1	3	9	1	83	25.9
Total	175	14	9	19	12	29	48	15	321	100.0
% Culture positive	60.0	78.6	88.9	73.7	66.7	69.0	68.8	73.3	65.4	

Molecular typing results

Of the 210 culture positive cases, MIRU-VNTR typing results were reported for 188 cases (89.5%). Of the 188 typed isolates, 143 (76.1%) were unique within 2017. Seventeen clusters comprising 45 cases were reported during 2017. These clusters comprised 13 pairs, one trio, two clusters of five matching isolates and one cluster with six matching isolates. Nine of these clusters represent expansion of previously documented clusters or outbreaks and one new cluster was confirmed as an outbreak during 2017.

Antibiotic resistance

Of the 210 culture positive cases reported, 188 (89.5%) had drug sensitivity details completed. Resistance was reported in 19 cases (10.1% of cases with drug sensitivity data reported and 5.9% of total cases reported). Of the 19 resistant cases, two were MDR-TB and two were XDR-TB. Details of the resistant case are presented in table 8.

Table 8: Sensitivity results of drug resistant TB cases in Ireland, Q1-4 2017

Isolate	Isoniazid sensitivity	Rifampicin sensitivity	Ethambutol sensitivity	Pyrazinamide sensitivity	Streptomycin sensitivity	Previous history of TB disease	Born outside Ireland	Age group
<i>M. tb</i>	R	R	R	R	R		FB	35-44
<i>M. tb</i>	R	R	R	R	R		FB	35-44
<i>M. tb</i>	S	R	S	S			FB	25-34
<i>M. tb</i>	R	R	R	R	R	No	FB	35-44
<i>M. tb</i>	R	R	R	R			Unk	45-54
<i>M. tb</i>	S	S	S	R	S	No	FB	20-24
<i>M. tb</i>	R	S	S	S	R	No	FB	35-44
<i>M. tb</i>	S	S	S	S	R	No	FB	35-44
<i>M. tb</i>	R	S	S	S	R	No	Unk	25-34
<i>M. tb</i>	R	S	S	S	S		FB	35-44
<i>M. tb</i>	R	S	S	S	S	Unknown	FB	15-19
<i>M. tb</i>	R	S	S	S	R		IE	25-34
<i>M. tb</i>	S	S	S	S	R		FB	25-34
<i>M. tb</i>	S	S	S	R	S	No	FB	65+
<i>M. tb</i>	S	S	S	R	S	Yes	FB	35-44
<i>M. tb</i>	S	S	S	S	R		IE	45-54
<i>M. tb</i>	R	S	S	S	R	No	FB	25-34
<i>M. tb</i>	S	S	S	S	R	No	IE	25-34

R=resistant; S=sensitive; M. tb = *M. tuberculosis*

Chest X-ray

One hundred and twenty-three cases with a pulmonary component (57.7% of pulmonary cases) had X-ray findings consistent with active pulmonary TB (table 9).

Table 9: Chest X-ray results of TB cases with a pulmonary component, Q1-4 2017

Chest X-ray	Number of TB cases	% Total
Active non-cavitary TB	78	36.6
Active cavitary TB	45	21.1
Pleural	2	0.9
Inactive/old TB	2	0.9
Normal	7	3.3
Other	14	6.6
Not done	2	0.9
Not reported	63	29.6
Total	213	100.0

Case ascertainment

Table 10 summarises the method by which reported cases were detected. The majority of cases (69.5%) presented as clinical cases.

Table 10: Number and percentage of TB notifications by method of case finding, Q1-4 2017

Found by	Number of TB cases	% Total
Presenting as case	223	69.5
Contact tracing	14	4.4
Post-mortem diagnosis	5	1.6
Pre-employment screening	2	0.6
Immigrant screening	1	0.3
Other	14	4.4
Not reported	62	19.3
Total	321	100.0

Previous history

Seventeen cases (5.3% of total reported) had a previous history of TB, 10 of whom were born outside Ireland. Year of previous diagnosis ranged from 1948 to 2016 for these cases.

HIV status

HIV status was reported for 96 (29.9%) TB cases. Of these 96 TB cases, 14 (14.6%) tested positive for HIV and 82 (85.4%) tested negative for HIV.

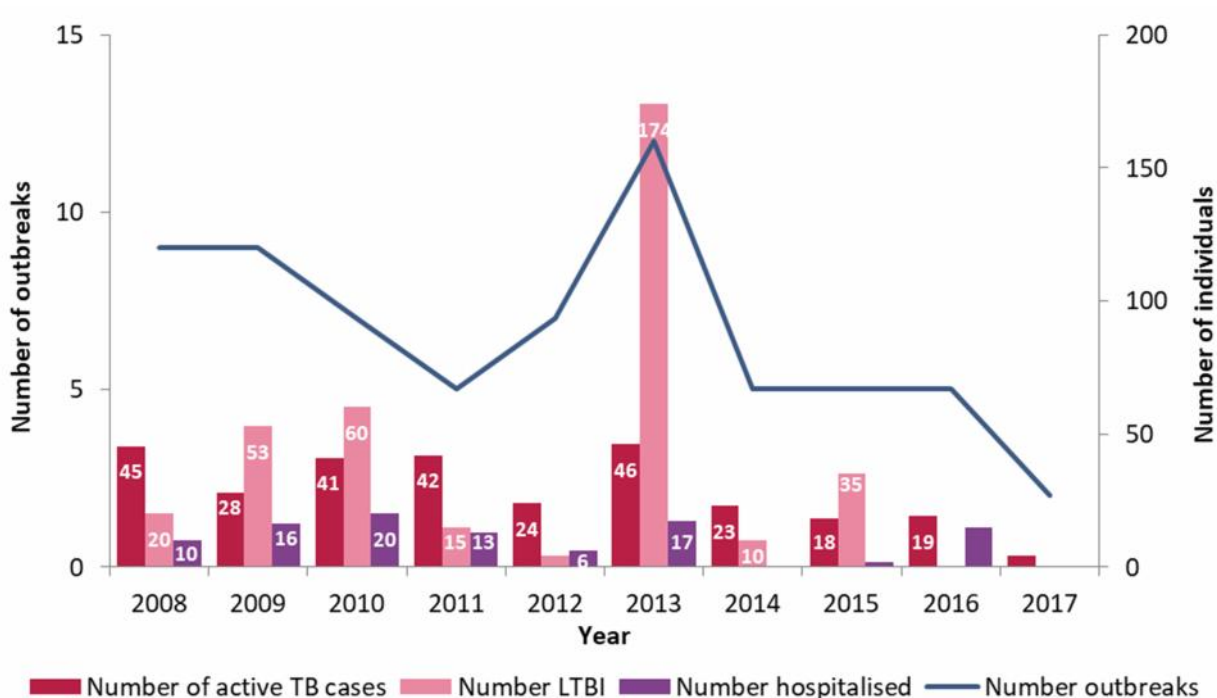
Outcome

Fourteen TB deaths were reported during this period. Cause of death was reported as due to TB for four cases, not due to TB for three cases, awaiting a coroner's report for two cases while cause of death for the remaining five cases were either pending or unknown.

Outbreaks

Two TB outbreaks comprising two cases each were reported to HPSC during this period. One was a general outbreak in a community setting and one was a family outbreak in a private house. Figure 5 outlines TB outbreaks by year including the number of active and latent TB cases and the number of cases hospitalised.

Figure 5: TB outbreak summary by year



Acknowledgements

Sincere thanks are extended to all those who participated in the collection of data used in this report. This includes the notifying physicians, public health doctors, surveillance scientists, microbiologists, nurses, laboratory staff and administrative staff.

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Appendix 1:

Figure A1: TB notifications, 3 year moving average and crude incidence rate by year

