

# Annual Epidemiological Report

February 2019

## National TB surveillance in Ireland, 2018

### Key Facts

- 315 TB cases were notified to HPSC corresponding to a crude incidence rate (CIR) of 6.6 / 100,000 population \*
- HSE East reported the highest number of cases at 157 (49.8% of total) and CIR of 9.2
- The male to female ratio was 1.5:1
- The highest age-specific rate (ASIR) occurred in those aged 65 years and over (11.0) and the lowest ASIR was in the 0-14 year age group (0.7)
- 44.1% of cases were born in Ireland (CIR of 3.6) and 43.8% were foreign born (CIR of 17.0) while 12.1% did not report country of birth
- Two cases of TB meningitis were reported
- 219 cases (69.5%) were culture positive, 16 (5.1%) were culture negative, 10 (3.2%) were reported as not having been culture tested while culture result was not reported for the remaining 70 cases (22.2%)
- *M. tuberculosis* was isolated in 210 (95.9%), *M. bovis* in seven (3.2%) and *M. africanum* in two (0.9%)
- Amongst culture positive cases, 189 (86.3%) had drug sensitivity details
- Resistance was reported in 18 cases, including 5 multidrug resistant (MDR-TB) cases and 2 rifampicin mono-resistant cases
- HIV status was reported for 131 (41.6%) TB cases, of whom 13 (9.9%) tested positive for HIV and 118 (90.1%) tested negative for HIV
- Eight TB outbreaks were reported during this period

## Table of Contents

Background.....	3
Methods .....	3
Results .....	3
Total cases of tuberculosis notified.....	3
Age and sex distribution.....	5
Country of origin.....	6
Diagnostic categories .....	8
Microbiological results: .....	9
Sputum-smear status – at initial diagnosis.....	9
Culture – sample and isolates at initial diagnosis .....	9
Antibiotic resistance .....	10
Molecular typing results.....	10
Chest X-ray.....	11
Case ascertainment .....	11
Previous history .....	11
HIV status.....	11
Outcome .....	12
Outbreaks .....	12
Acknowledgements .....	12
Report prepared by: .....	12
Appendix 1:.....	13

## Background

This 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 2018. Further information on TB is available at [www.hpsc.ie](http://www.hpsc.ie).

## Methods

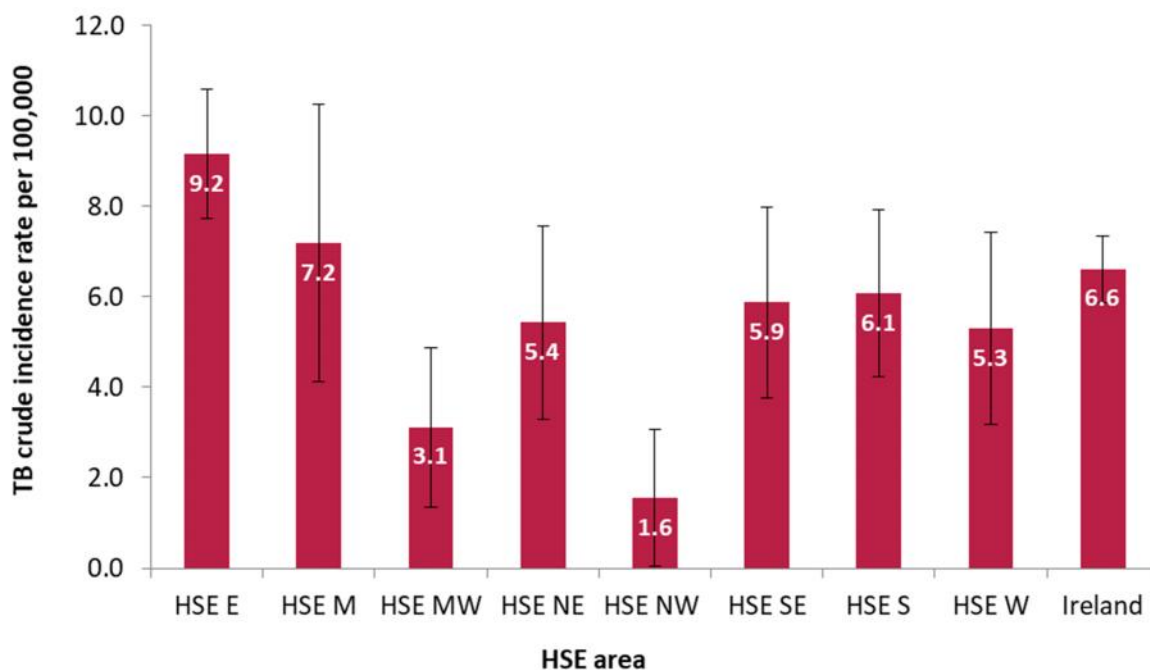
Enhanced TB notification forms are completed by public health doctors for each case of TB notified. These forms summarise all available clinical, microbiological, histological and epidemiological data. Forms are then collated in the regional departments of public health and entered onto the Computerised 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 11/02/2019.

## Results

### Total cases of tuberculosis notified

There were 315 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 CIR while the CIRs in HSE-MW and –NW were 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, 2018**



\* All crude incidence rates in this report are calculated per 100,000 population using the 2016 Census denominator data

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

**Table 1: Number and percentage of TB notifications by HSE area, 2018**

HSE Area	Number of TB cases	% of Total	Local Health Office	Number of TB cases
<b>East</b>	157 <sup>‡</sup>	49.8	Dublin South	13
			Dublin South East	18
			Dublin South City	15
			Dublin South West	13
			Dublin West	13
			Dublin North West	22
			Dublin North Central	20
			Dublin North	26
			Kildare/West Wicklow	8
			Wicklow	8
<b>Midland</b>	21	6.7	Longford/Westmeath	12
			Laois/Offaly	9
<b>Mid-West</b>	12	3.8	Clare	6
			Limerick	6
			Tipperary N	0
<b>North East</b>	25	8.0	Cavan	1
			Louth	13
			Meath	10
			Monaghan	1
<b>North West</b>	4	1.3	Donegal	3
			Sligo/Leitrim	1
<b>South</b>	42	13.4	Kerry	9
			North Cork	7
			North/South Lee	25
			West Cork	1
<b>South East</b>	30	9.6	Carlow/Kilkenny	9
			Tipperary S	1
			Waterford	13
			Wexford	7
<b>West</b>	24	7.6	Galway	18
			Mayo	5
			Roscommon	1
<b>Ireland</b>	<b>315</b>	<b>6.6</b>	<b>Total</b>	<b>314</b>

<sup>‡</sup> One case notified by HSE-E did not have LHO reported

### Age and sex distribution

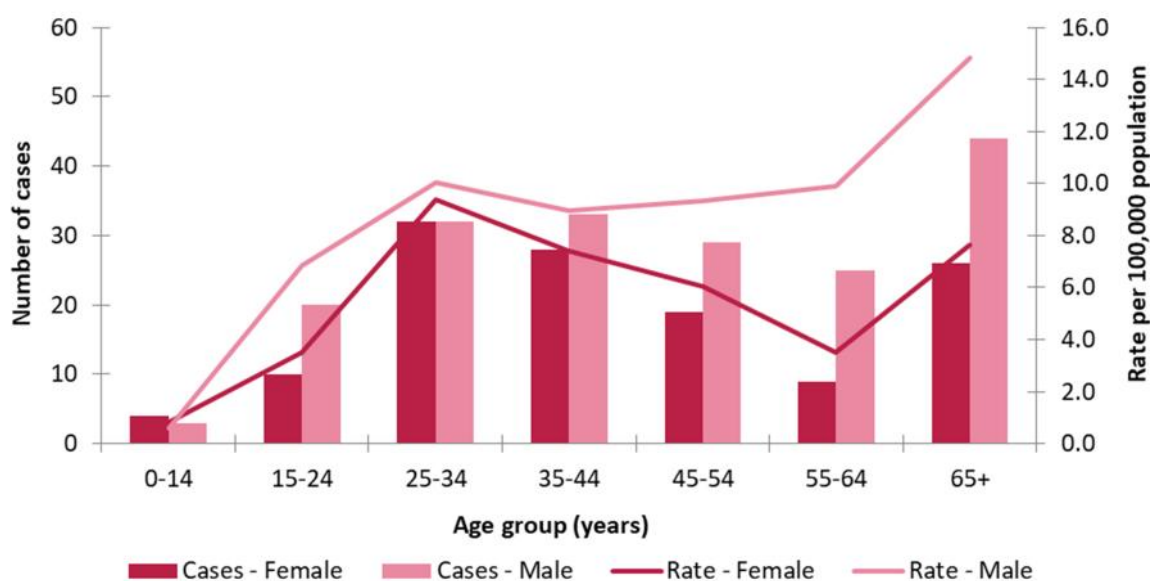
A breakdown of cases by age group and HSE area is shown in table 2 while figure 2 shows the age and sex specific incidence rates for 2018 and figure 3 displays the trend in the 0-14 year age group by year.

There were 128 females (40.6%) and 186 males (59.0%), corresponding to a male to female ratio of 1.5:1. Age was not reported for one case. Age-specific incidence rates (ASIRs) were highest in those aged 65 years and older (11.0) and in the 25-34 year age group (9.7). ASIRs were higher among males than females for all age groups except for the 0-14 year age group where they were equivalent. The highest ASIR among females was in the 25-34 year age group (9.4) while the highest ASIR among males was among those aged 65 years and older (14.8).

**Table 2: Number and percentage of TB notifications by age group and HSE area, 2018**

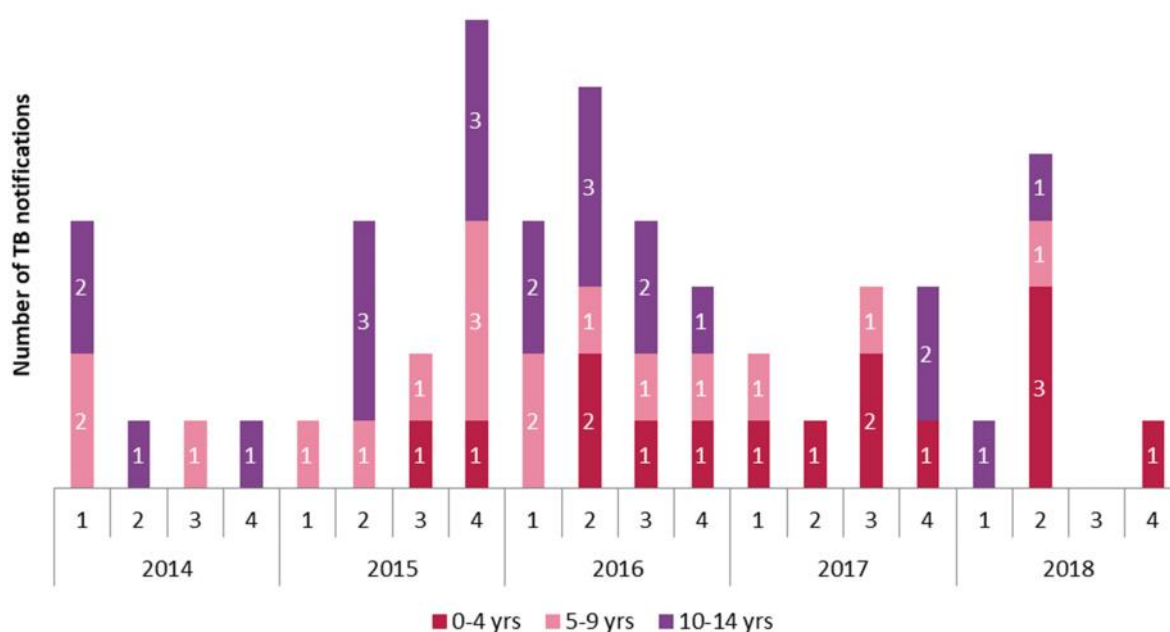
Age group (years)	HSE-E	HSE-M	HSE-MW	HSE-NE	HSE-NW	HSE-SE	HSE-S	HSE-W	Total	% Total
0-4		1		1			2		4	1.3
5-9							1		1	0.3
10-14				1			1		2	0.6
15-19	3	1		1		1	5	2	13	4.1
20-24	6		3	3			1	4	17	5.4
25-34	39	2	4	1		5	12	1	64	20.3
35-44	35	6	1	7		7	4	2	62	19.7
45-54	22	4		5	1	4	7	5	48	15.2
55-64	17	3		2		8	2	2	34	10.8
65+	35	4	4	4	3	5	7	8	70	22.2
Unk	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>157</b>	<b>21</b>	<b>12</b>	<b>25</b>	<b>4</b>	<b>30</b>	<b>42</b>	<b>24</b>	<b>315</b>	<b>100.0</b>

**Figure 2: Number of TB notifications and age specific rate by sex, 2018**



During 2018, seven cases were reported in the 0-14 year age group, three of whom were born in Ireland. Risk factors reported in this age group included being a contact of a TB case (n=5) and being born in a country of high endemicity (n=4). Five cases reported BCG status, all of whom were vaccinated. Vaccination status for the remaining two cases was not reported. Four cases in this age group were linked to three outbreaks.

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



### Country of origin

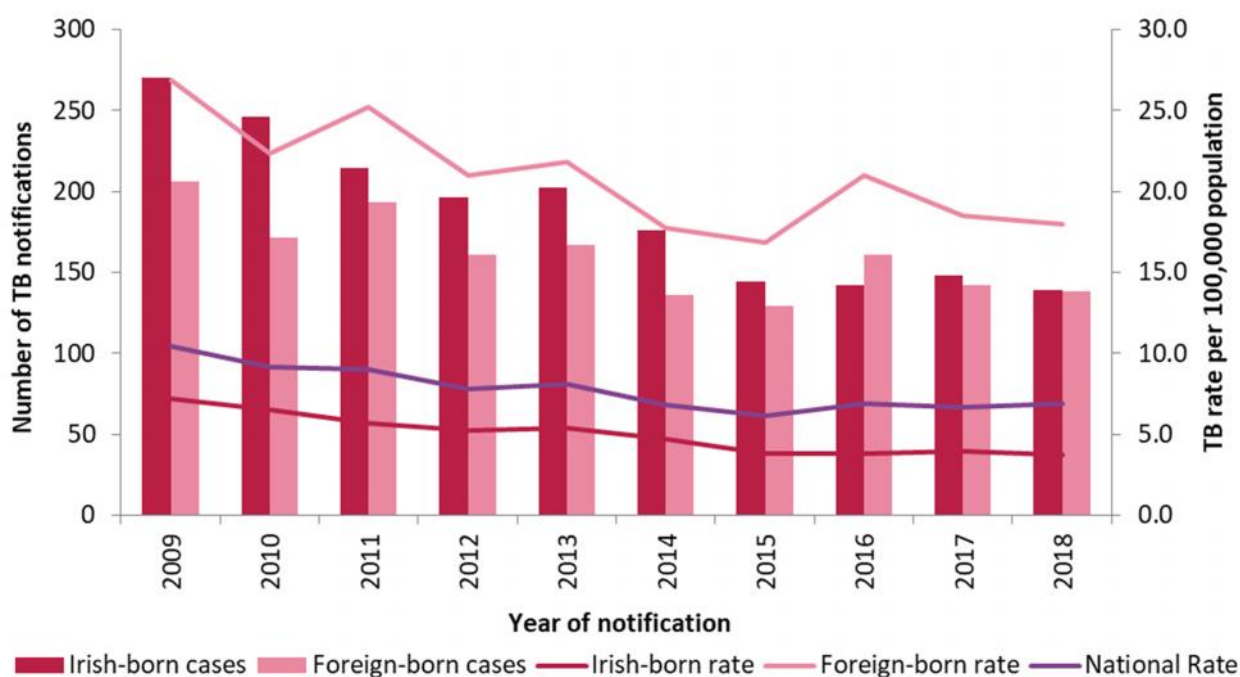
Of the 315 cases reported during this period, 139 (44.1%, CIR: 3.6) were born in Ireland and 138 (43.8%, CIR: 17.0) were born outside Ireland. Country of birth was not reported for 38 (12.0%) cases. Of the 138 cases born outside Ireland, 14 (10.0%) were reported as asylum seekers or refugees (six from HSE-E, four from HSE-S, two from HSE-M, and one each from HSE-NE and -W). Table 3 summarises the regions of birth of cases and figure 4 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 (8.1) were in those aged 65 years and older, while the highest rates in foreign-born cases (23.1) were aged between 25-34 years old (table 4).

**Table 3: TB notifications by region of origin, 2018**

Region of origin	Number	%
Ireland	139	44.1
Eastern Asia	2	0.6
Eastern Europe	22	7.0
Latin America	7	2.2
North Africa	1	0.3
North America	2	0.6
Northern Europe	10	3.2
South Asia	45	14.3
South East Asia	15	4.8
Southern Europe	2	0.6
Sub-Saharan Africa	31	9.8
Western Asia	1	0.3
Country of birth not reported	38	12.1
<b>Total</b>	<b>315</b>	<b>100.0</b>

**Figure 4: Number of TB notifications and crude incidence rate by geographic origin and year**



**Table 4: TB notifications age group and geographic origin, 2018**

Age group (years)	Cases - Irish born	Rate - Irish born	% Irish	Cases - Foreign born	Rate - Foreign born	% Foreign	Country of birth unk	Total
0-14	3	<b>0.3</b>	42.9	4	<b>5.3</b>	57.1	0	<b>7</b>
15-24	10	<b>2.2</b>	33.3	18	<b>17.0</b>	60.0	2	<b>30</b>
25-34	17	<b>3.7</b>	26.6	43	<b>23.1</b>	67.2	4	<b>64</b>
35-44	21	<b>3.8</b>	33.9	35	<b>18.2</b>	56.5	6	<b>62</b>
45-54	21	<b>4.4</b>	43.8	23	<b>16.8</b>	47.9	4	<b>48</b>
55-64	20	<b>4.6</b>	58.8	10	<b>15.2</b>	29.4	4	<b>34</b>
65+	47	<b>8.1</b>	67.1	5	<b>10.4</b>	7.1	18	<b>70</b>
Age unk								<b>0</b>
<b>All ages</b>	<b>139</b>	<b>3.6</b>	<b>44.1</b>	<b>138</b>	<b>17.0</b>	<b>43.8</b>	<b>38</b>	<b>315</b>

### Diagnostic categories

Cases are classified into one of three diagnostic categories based on the site of disease. Extra-pulmonary disease components were reported in 109 cases (34.6%). Two cases of TB meningitis were reported during this period. One meningitis case was Irish-born while the other was born in a country of high endemicity. One case was in the 15-24 year age group and one was aged 65 years and older. BCG status was not reported for either case.

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, 2018**

HSE area	Pulmonary	Pulmonary & extrapulmonary (P+E)	Extrapulmonary	Not reported	Total
HSE-E	99	9	42	7	<b>157</b>
HSE-M	10	2	7	2	<b>21</b>
HSE-MW	6	2	4	0	<b>12</b>
HSE-NE	14	0	10	1	<b>25</b>
HSE-NW	1	0	2	1	<b>4</b>
HSE-SE	15	9	6	0	<b>30</b>
HSE-S	28	3	9	2	<b>42</b>
HSE-W	20	0	4	0	<b>24</b>
<b>Total</b>	<b>193</b>	<b>25</b>	<b>84</b>	<b>13</b>	<b>315</b>
<b>%</b>	<b>61.3</b>	<b>7.9</b>	<b>26.7</b>	<b>4.1</b>	<b>100.0</b>



**Table 6: Number and percentage of TB notifications by extrapulmonary site of disease, 2018**

Extrapulmonary sites	Number of TB cases	% Total
Lymphatic extrathoracic	27	24.8
Pleural	25	22.9
Lymphatic intrathoracic	10	9.2
Other	8	7.3
Genito-urinary	7	6.4
Disseminated	5	4.6
Peritoneal/digestive	5	4.6
Spine	4	3.7
Bone/joint other than spine	2	1.8
Central nervous system other than meningitis	2	1.8
Meningitis	2	1.8
Joint	1	0.9
Not reported	11	10.1
<b>Total</b>	<b>109</b>	<b>100.0</b>

## Microbiological results:

### Sputum-smear status – at initial diagnosis

Of the 218 cases with a pulmonary component reported, 72 (33.0%) were sputum smear positive at diagnosis. Of the smear positive cases, 28 (38.9%) reported a second sputum smear positive result.

### Culture – sample and isolates at initial diagnosis

Of the 315 cases reported during this period, 219 cases (69.5%) were culture positive, 16 (5.1%) were culture negative and 10 (3.2%) were reported as not having been culture tested (table 7). Culture result was not reported for the remaining 70 cases (22.2%). Of the 219 culture positive cases, *M. tuberculosis* was isolated in 210 (95.9%), *M. bovis* in seven (3.2%) and *M. africanum* in two (0.9%).

**Table 7: Number and percentage of TB notifications by first culture result and HSE area, 2018**

Culture	HSE E	HSE M	HSE MW	HSE NE	HSE NW	HSE SE	HSE S	HSE W	Total	% Total
Culture positive	108	11	9	17	4	25	25	20	<b>219</b>	69.5
Culture negative	8		2	1		1	2	2	<b>16</b>	5.1
Not done	3	1				1	5		<b>10</b>	3.2
Not reported	38	9	1	7		3	10	2	<b>70</b>	22.2
<b>Total</b>	<b>157</b>	<b>21</b>	<b>12</b>	<b>25</b>	<b>4</b>	<b>30</b>	<b>42</b>	<b>24</b>	<b>315</b>	<b>100.0</b>
<b>% Culture positive</b>	68.8	52.4	75.0	68.0	100.0	83.3	59.5	83.3	69.5	

### Antibiotic resistance

Of the 219 culture positive cases reported, 189 (86.3%) had drug sensitivity details completed. Resistance was reported in 18 cases (8.2% of cases with drug sensitivity data reported and 5.7% of total cases reported). Of the 18 resistant cases, five were MDR-TB and two were rifampicin mono-resistant. Details of the resistant case are presented in table 8.

**Table 8: Sensitivity results of drug resistant TB cases in Ireland, 2018**

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	S	R	R	No	Yes	35-44
<i>M.tb</i>	R	R			S	Unk	Unk	45-54
<i>M.tb</i>	R	R	R	R	S	Yes	Yes	25-34
<i>M.tb</i>	R	R	S	S		No	No	45-54
<i>M.tb</i>	R	R	S	S	R	No	Yes	45-54
<i>M.tb</i>	R	S				No	Yes	35-44
<i>M.tb</i>	R	S				Unk	Unk	35-44
<i>M.tb</i>	R	S				No	Yes	25-34
<i>M.tb</i>	R	S	S		S	No	Yes	35-44
<i>M.tb</i>	R	S	S	S	R	Unk	Unk	25-34
<i>M.tb</i>	R	S				No	Yes	35-44
<i>M.tb</i>	R	S	S	S	S	Unk	Unk	35-44
<i>M.tb</i>	S	R	S	S	S	No	No	25-34
<i>M.tb</i>	S	R	S	S	S	No	Yes	45-54
<i>M.tb</i>	S	S	S	R	S	Unk	Yes	45-54
<i>M.tb</i>	S	S	S	S	R	Unk	Yes	25-34
<i>M.tb</i>	S	S	S	R	S	Unk	No	45-54
<i>M.tb</i>	S	S	S	S	R	No	Yes	45-54

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

### Molecular typing results

Of the 219 culture positive cases, MIRU-VNTR typing results were reported for 180 cases (82.2%). Of the 180 typed isolates, 140 (77.8%) were unique within 2018. Twelve clusters comprising 40 cases were reported during 2018. These clusters comprised six pairs, two trios, two clusters of four matching isolates, one cluster with six matching isolates and one with eight matching isolates. Ten clusters were already documented clusters or outbreaks previously investigated by public health. The remaining two clusters were of a small magnitude, comprising two pairs of matching isolates.

## Chest X-ray

One hundred and twenty-nine cases with a pulmonary component (59.2% 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 2018**

Chest X-ray	Number of TB cases	% Total
Active cavitory TB	39	17.9
Active non-cavitory TB	90	41.3
Pleural	2	0.9
Inactive/old TB	3	1.4
Other	18	8.3
Normal	8	3.7
Not done	1	0.5
Not reported	57	26.1
<b>Total</b>	<b>218</b>	<b>100.0</b>

## Case ascertainment

Table 10 summarises the method by which reported cases were detected. The majority of cases (65.4) presented as clinical cases.

**Table 10: Number and percentage of TB notifications by method of case finding, Q1-4 2018**

Found by	Number of TB cases	% Total
Presenting as case	206	65.4
Contact tracing	24	7.6
Immigrant screening	2	0.6
Post-mortem diagnosis	5	1.6
Other	17	5.4
Not reported	61	19.4
<b>Total</b>	<b>315</b>	<b>100.0</b>

## Previous history

Eighteen cases (5.7% of total reported) had a previous history of TB, eight of whom were born outside Ireland. Year of previous diagnosis ranged from 1946 to 2017 for these cases.

## HIV status

HIV status was reported for 131 (41.6%) TB cases. Of these 131 TB cases, 13 (9.9%) tested positive for HIV and 118 (90.1%) tested negative for HIV.

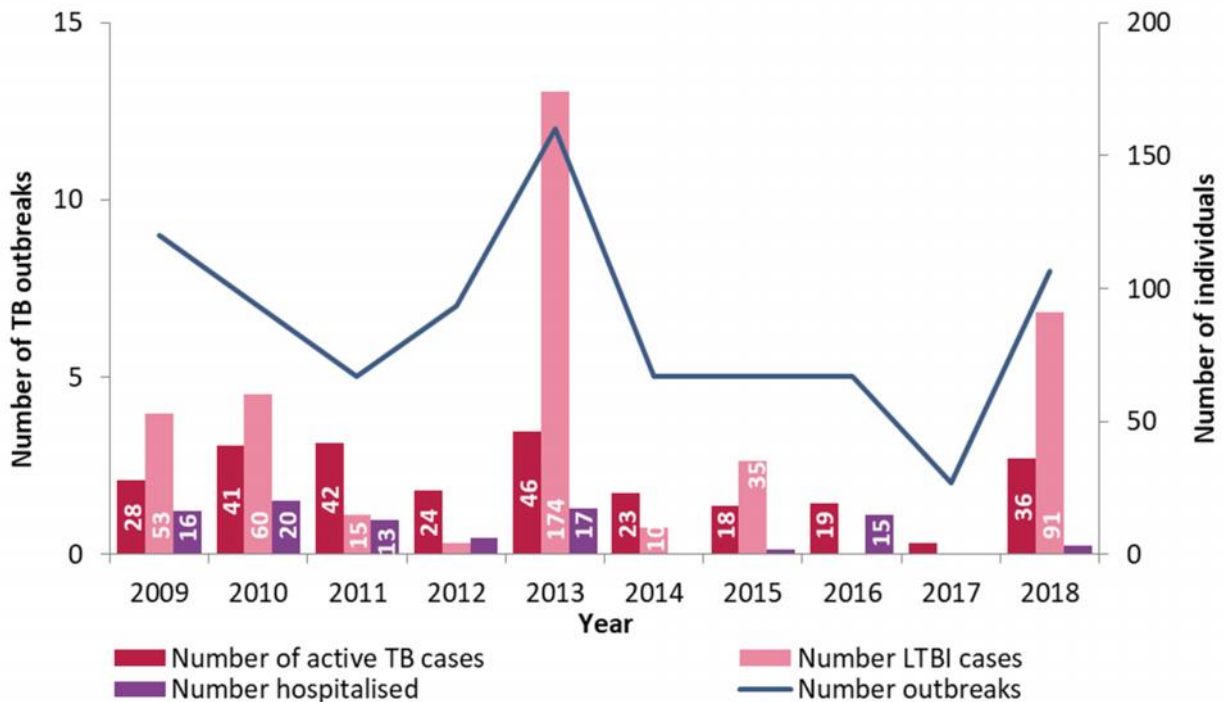
### Outcome

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 four cases, awaiting a coroner’s report for one case while cause of death for the remaining five cases were either pending or unknown.

### Outbreaks

Eight TB outbreaks comprising 36 associated cases were reported to HPSC during this period. Two general outbreaks occurred in residential institutions, one occurred in a community setting, one was in a hospital and one occurred across multiple locations. Two family outbreaks occurred in private houses and one occurred in an extended family. Figure 5 outlines TB outbreaks by year including the number of active and latent TB cases and the number of cases hospitalised. Of the eight outbreaks, three reported LTBI cases.

**Figure 5: TB outbreak summary by year**



### Acknowledgements

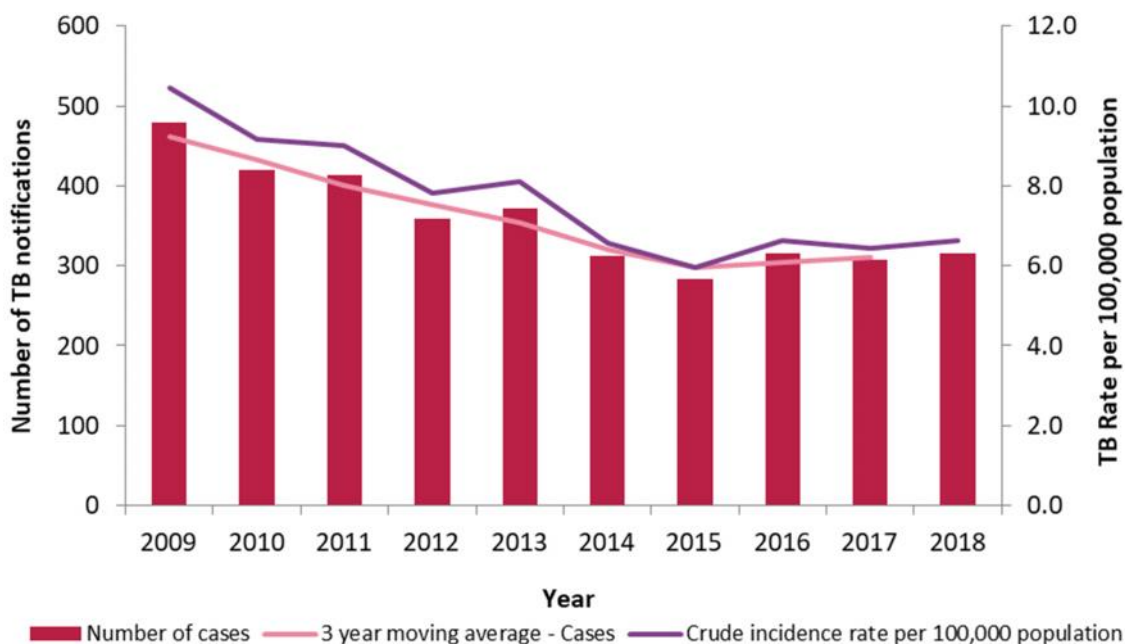
Sincere thanks are extended to all those who participated in the collection of data used in this report. This includes the notifying physicians, public health doctors, surveillance scientists, microbiologists, nurses, laboratory staff and administrative staff.

### Report prepared by:

**Sarah Jackson and Joan O’Donnell**

## Appendix 1:

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



**Figure A2: TB crude incidence rate per 100,000 population by HSE area and year**

