



## **National TB Surveillance**

**A report by the Health Protection Surveillance Centre**

**Provisional**

**Quarter 1 - 4 2016 TB Report**

Report produced 27<sup>th</sup> February 2017\*

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\* The data in this report are provisional and will not be regarded as final until all notification data on individual cases are complete and the data have been validated.  
Data extracted from CIDR 17/02/2017

## Introduction

This Quarter 1-4 2016 TB Report presents an epidemiological summary of the cases of tuberculosis (TB) notified to eight HSE areas in Ireland during January - December 2016.

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 in quarterly reports should be regarded as provisional until a process of validation has been completed at the end of that notification year.**

### Summary: Q 1 - 4 2016:

- 319 TB cases<sup>†</sup> were notified to HPSC, corresponding to a provisional crude incidence rate of 7.0 per 100,000 population.
- HSE East reported the highest number of cases at 136 (42.6% of total), with 36.4% of total cases being reported in Dublin.
- More cases were reported in males (60.8%) than females.
- The highest proportion of cases (25.1%) occurred in those aged 25-34 years followed by 17.6% of cases in those aged 65 years and older and 16.3% in those aged 35-44 years.
- 49.2% of all cases were foreign born.
- No cases of TB meningitis were notified.
- 234 cases (73.4%) were culture positive, 26 (8.2%) were culture negative, eight (2.5%) were reported as not having been culture tested and 51 (16.0%) cases did not have culture results available.
- Of the 234 culture positive cases, *M. tuberculosis* was isolated in 229 (97.9%), *M. bovis* in three (1.3%) and *M. africanum* in two (0.9%).
- Of the 234 culture positive cases reported, 218 (93.2%) had drug sensitivity details completed<sup>‡</sup>.
- Resistance was reported in 28 cases, including 5 MDR-TB cases and 1 XDR-TB case.

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<sup>†</sup> Data in quarterly reports should be regarded as provisional until a process of validation has been completed at the end of that notification year.

<sup>‡</sup> This relates to TB cases with susceptibility results reported for at least isoniazid and rifampicin

## Results

### Total cases of tuberculosis notified in Q1 - 4 2016

There were 319 cases of TB notified during the period 1<sup>st</sup> January to 31<sup>st</sup> December 2016. This is higher than the number of TB notifications reported for quarter 1-4 2015, which was the lowest number of notifications for quarter 1-4 since TB surveillance began in 1998 ([Appendix 1](#)).

The number of cases notified in each HSE area and Local Health Authority (LHO) for Q 1-4 2016 is shown in [table 1](#) and [figure 1](#) and a breakdown of TB cases by county is shown in [table 2](#).

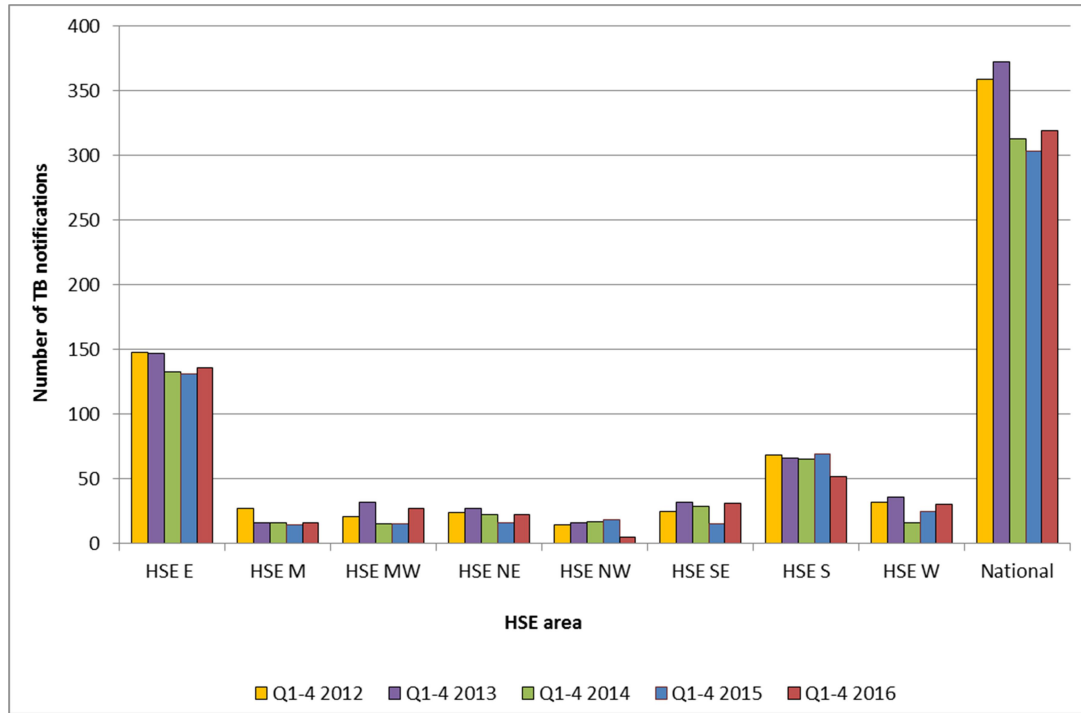


Figure 1: Number of TB notifications by HSE area and year<sup>§</sup>

<sup>§</sup> In January 2011, all HSE areas moved to using CIDR (computerised infectious disease reporting) to record TB case notification data.

Table 1: TB notifications by HSE area and LHO, Q1 – Q4 2016

HSE Area	Number of TB cases	% of Total	LHO	Number of TB cases
East	136	42.6	Dublin South	10
			Dublin South East	7
			Dublin South City	11
			Dublin South West	9
			Dublin West	15
			Dublin North West	27
			Dublin North Central	20
			Dublin North	17
			Kildare/West Wicklow	12
			Wicklow	8
Midland	16	5.0	Longford/Westmeath	5
			Laois/Offaly	11
Mid-West	27	8.5	Clare	8
			Limerick	16
			Tipperary N/ E Limerick	3
North East	22	6.9	Cavan	6
			Louth	10
			Meath	5
			Monaghan	1
North West	5	1.6	Donegal	2
			Sligo/Leitrim	3
South	52	16.3	Kerry	12
			North Cork	5
			North/South Lee	33
			West Cork	2
South East	31	9.7	Carlow/Kilkenny	16
			Tipperary S	1
			Waterford	10
			Wexford	4
West	30	9.4	Galway	17
			Mayo	6
			Roscommon	7
<b>Ireland</b>	<b>319</b>	<b>100.0</b>	<b>Total</b>	<b>319</b>

**Table 2: TB notifications by county, Q1 – Q4 2016**

County	Q1	Q2	Q3	Q4	Number of TB cases	% Total
Dublin	29	38	23	26	<b>116</b>	<b>36.4</b>
Kildare	2	7	2	1	<b>12</b>	<b>3.8</b>
Wicklow	2	4	2		<b>8</b>	<b>2.5</b>
Laois		3	3	1	<b>7</b>	<b>2.2</b>
Longford	1		1		<b>2</b>	<b>0.6</b>
Offaly				4	<b>4</b>	<b>1.3</b>
Westmeath	1		1	1	<b>3</b>	<b>0.9</b>
Clare	1	5	1	1	<b>8</b>	<b>2.5</b>
Limerick	5	4	4	3	<b>16</b>	<b>5.0</b>
Tipperary		1		2	<b>3</b>	<b>0.9</b>
Cavan	3	1	2		<b>6</b>	<b>1.9</b>
Louth	1	4	3	2	<b>10</b>	<b>3.1</b>
Meath	2	1	1	1	<b>5</b>	<b>1.6</b>
Monaghan			1		<b>1</b>	<b>0.3</b>
Donegal		1		1	<b>2</b>	<b>0.6</b>
Sligo	1	2			<b>3</b>	<b>0.9</b>
Carlow		3	3	1	<b>7</b>	<b>2.2</b>
Kilkenny	3	3	2	2	<b>10</b>	<b>3.1</b>
Tipperary	1				<b>1</b>	<b>0.3</b>
Waterford	1	4	1	3	<b>9</b>	<b>2.8</b>
Wexford	1	1	1	1	<b>4</b>	<b>1.3</b>
Cork	7	17	9	7	<b>40</b>	<b>12.5</b>
Kerry	3		4	5	<b>12</b>	<b>3.8</b>
Galway	6	3	5	3	<b>17</b>	<b>5.3</b>
Mayo	4		2		<b>6</b>	<b>1.9</b>
Roscommon	2	1	2	2	<b>7</b>	<b>2.2</b>
<b>Total</b>	<b>76</b>	<b>103</b>	<b>73</b>	<b>67</b>	<b>319</b>	<b>100.0</b>

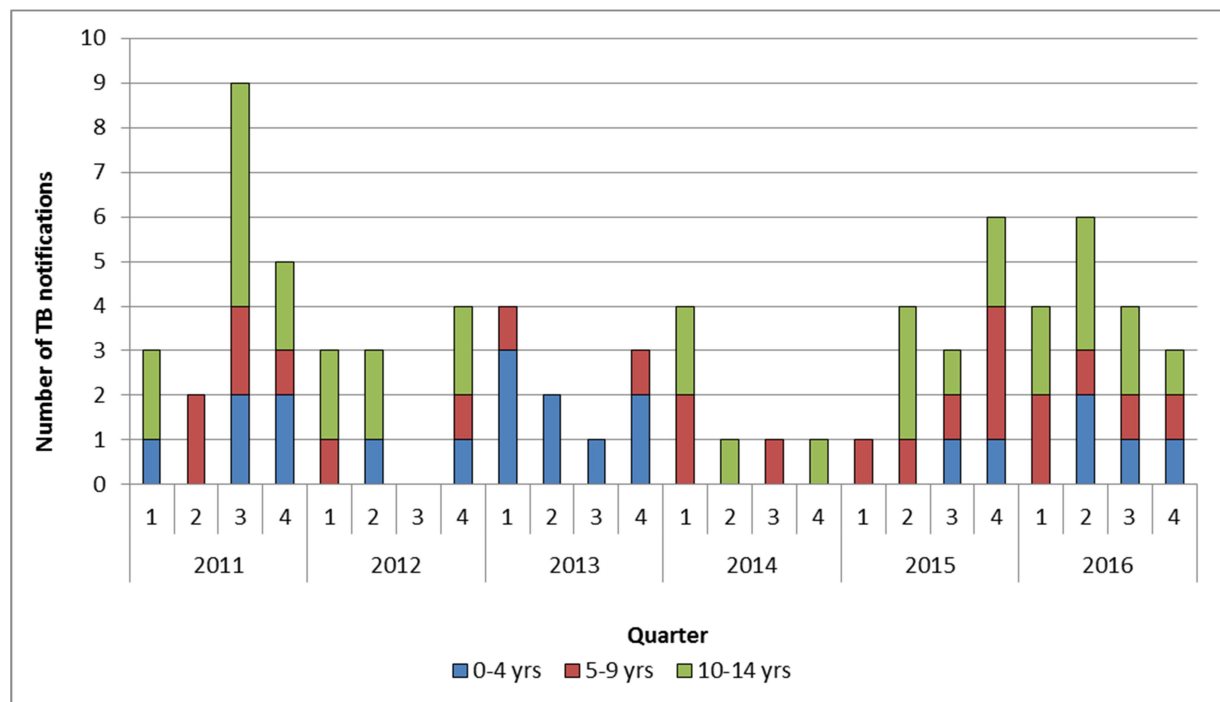
## Age groups

A breakdown of cases by age group and HSE area is shown in [table 3](#) while [figure 2](#) displays the trend in the 0-14 year age group by year. Age was unknown for one case in 2016.

**Table 3: Number and percentage of TB notifications by age group and HSE area, Q1 – Q4 2016**

Age group (years)	HSE-E	HSE-M	HSE-MW	HSE-NE	HSE-NW	HSE-SE	HSE-S	HSE-W	Total	% Total
0-4		1					2	1	<b>4</b>	1.3
5-9	2		1				0	2	<b>5</b>	1.6
10-14	5	1	1				1	0	<b>8</b>	2.5
15-19	2		1	1			1	3	<b>8</b>	2.5
20-24	13		1			2	3	2	<b>21</b>	6.6
25-34	41	2	7	8	1	6	9	6	<b>80</b>	25.2
35-44	24	4	4	4		1	9	6	<b>52</b>	16.4
45-54	18	1	6	2	1	7	6	4	<b>45</b>	14.2
55-64	13	2		2		7	11	3	<b>38</b>	11.9
65+	17	5	5	5	3	8	10	3	<b>56</b>	17.6
Unknown	1	0	0	0	0	0	0	0	<b>1</b>	0.3
<b>Total</b>	<b>136</b>	<b>16</b>	<b>26</b>	<b>22</b>	<b>5</b>	<b>31</b>	<b>52</b>	<b>30</b>	<b>318</b>	<b>100.0</b>

During Q1-4 2016, eight cases in the 0-14 year age group were born outside Ireland, eight were born in Ireland and the remaining case did not have country of birth reported.



**Figure 2: Number of notifications in 0-14 year age group by quarter and year**

## Sex

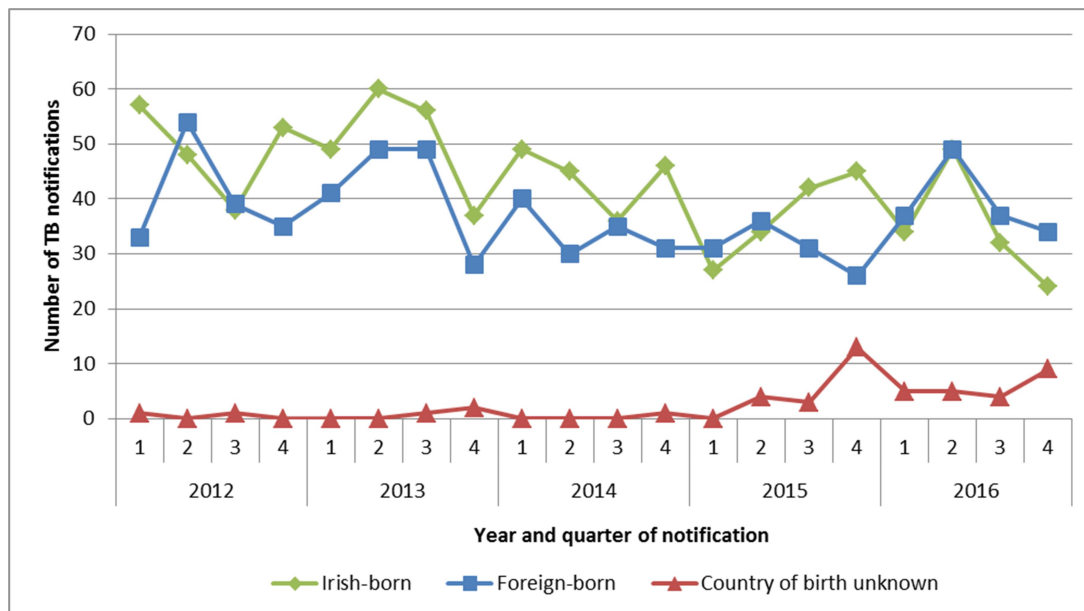
There were 125 females (39.2%) and 194 males (60.8%) in Q1 to Q4 2016.

### Country of origin

During Q1 – Q4 2016, 139 (43.6%) TB cases were born in Ireland and 157 (49.2%) were born outside Ireland. Country of birth was not reported for 23 (7.2%) cases. [Table 4](#) summarises the countries of birth of cases. Of those 156 cases born outside Ireland, 12 (7.7%) were reported as asylum seekers or refugees. There were four from HSE-E, three from HSE-W, two from HSE-MW and one each from HSE–NE, -SE and -S. Figure 3 shows the annual number of TB cases by year and geographic origin.

**Table 4: TB notifications by region of origin, Q1 – Q4 2016**

Region of origin	Number	%
Ireland	139	43.6
Western Europe	7	2.2
South Asia	79	24.8
Eastern Europe	25	7.8
Sub-Saharan Africa	24	7.5
Central Europe	15	4.7
Eastern Asia / Pacific	3	0.9
North Africa / Middle East	2	0.6
South America	1	0.3
Western Asia	1	0.3
Country of birth not reported	23	7.2
<b>Total</b>	<b>319</b>	<b>100.0</b>



**Figure 3: Number of TB notifications by year and quarter of notification and geographic origin**

## Case ascertainment

[Table 5](#) summarises the method by which reported cases were detected in Q1 to Q4 2016.

**Table 5: TB notifications by method of case finding, Q1 – Q4 2016**

Found by	Number of TB cases	% Total
Presenting as case	261	81.8
Contact tracing	17	5.3
Immigrant screening	1	0.3
Other	10	3.1
Post-mortem diagnosis	7	2.2
Not reported	23	7.2
<b>Total</b>	<b>319</b>	<b>100.0</b>

## Diagnostic categories

Cases are classified into one of three diagnostic categories based on the site of disease. [Table 6](#) summarises the available data for each HSE area.

**Table 6: TB notifications by diagnostic type and HSE area, Q1 – Q4 2016**

HSE area	Pulmonary	Pulmonary & Extrapulmonary (P+E)	Extrapulmonary	Not reported	Total
HSE-E	71	12	45	8	<b>136</b>
HSE-M	8	3	5	0	<b>16</b>
HSE-MW	13	3	11	0	<b>27</b>
HSE-NE	14	1	7	0	<b>22</b>
HSE-NW	2	2	1	0	<b>5</b>
HSE-SE	18	7	6	0	<b>31</b>
HSE-S	34	6	12	0	<b>52</b>
HSE-W	18	1	11	0	<b>30</b>
<b>Total</b>	<b>178</b>	<b>35</b>	<b>98</b>	<b>8</b>	<b>319</b>
<b>%</b>	<b>55.8</b>	<b>11.0</b>	<b>30.7</b>	<b>2.5</b>	<b>100.0</b>

One hundred and thirty-three cases (41.7%) had an extra-pulmonary disease component reported ([table 7](#)).

## *TB meningitis*

No cases of TB meningitis were reported during Q1-4 2016.



**Table 7: TB notifications by extrapulmonary site of disease, Q1-4 2016**

Extra-pulmonary sites	Number of TB cases	% Total
Lymphatic extrathoracic	36	27.1
Pleural	26	19.5
Other	22	16.5
Bone/joint other than spine	9	6.8
Spine	8	6.0
Lymphatic intrathoracic	7	5.3
Peritoneal/digestive	6	4.5
Genito-urinary	5	3.8
Disseminated	4	3.0
Central nervous system other than meningitis	1	0.8
Not reported	9	6.8
<b>Total</b>	<b>133</b>	<b>100.0</b>

### Sputum-smear status - at initial diagnosis

Of the 213 cases with a pulmonary component reported during Q1-4 2016, 99 (46.5%) were sputum smear positive at diagnosis. Forty-two of these cases (42.4%) reported a second sputum smear positive result.

### Culture and isolates - at initial diagnosis

During Q1-Q4 2016, 234 cases (73.4%) were culture positive, 26 (8.2%) were culture negative, eight (2.5%) were reported as not having been culture tested and 51 (16.0%) cases did not have culture results available ([table 8](#)). Of the 234 culture positive cases, *M. tuberculosis* was isolated in 229 (97.9%), *M. bovis* in three (1.3%) and *M. africanum* in two (0.9%).

**Table 8: TB notifications by first culture result and HSE area, Q1 – Q4 2016**

Culture	HSE E	HSE M	HSE MW	HSE NE	HSE NW	HSE SE	HSE S	HSE W	Total	% Total
Culture positive	96	13	23	19	5	24	35	19	<b>234</b>	73.4
Culture negative	2	1	3			4	9	7	<b>26</b>	8.2
Not done	5			1			1	1	<b>8</b>	2.5
Not reported	33	2	1	2		3	7	3	<b>51</b>	16.0
<b>Total</b>	<b>136</b>	<b>16</b>	<b>27</b>	<b>22</b>	<b>5</b>	<b>31</b>	<b>52</b>	<b>30</b>	<b>319</b>	<b>100.0</b>
% Culture positive	70.6	81.3	85.2	86.4	100.0	77.4	67.3	63.3		

### MIRU VNTR results

Of the 234 culture positive cases, MIRU-VNTR typing results were reported for 218 cases (93.2%). Of the 218 typed isolates, 180 (82.6%) were unique. Thirty-eight isolates had a 24 loci match with one or more typed isolates. These matching isolates were spread over 16 clusters. Twelve of these clusters were already documented clusters previously investigated by public health. The remaining four clusters were of a small magnitude, comprising four pairs of matching isolates.

## Antibiotic resistance

Of the 234 culture positive cases reported, 218 (93.2%) had drug sensitivity details completed\*\*. Resistance was reported in 28 cases (12.8% of 218 cases with drug sensitivity data reported and 8.8% of total cases reported). *M. tuberculosis* was isolated in 27 resistant cases and *M. africanum* was isolated in one resistant case. Twenty-four resistant cases (85.7%) were born outside Ireland while three resistant cases (10.7%) were born in Ireland. Country of birth was unknown for the remaining resistant case. Three resistant cases had a recorded previous history of TB ([table 9](#)).

Multidrug-resistant TB was reported in six foreign-born cases, including one case of extensively drug resistant (XDR) TB. Two MDR-TB cases (including the XDR-TB case) reported a previous history of TB. ††

**Table 9: Sensitivity results of drug resistant TB cases in Ireland, Q1 – Q4 2016**

Isolate	Isoniazid sensitivity	Rifampicin sensitivity	Ethambutol sensitivity	Pyrazinamide sensitivity	Streptomycin sensitivity	Previous history of TB disease	Born outside Ireland?	Age group (years)
<i>M. africa</i>	R	S	S	S	S	Unk	No	10-14
<i>M. tb</i>	R	S	S	S	S	Unk	Yes	45-54
<i>M. tb</i>	R	S	R	S	R	Unk	Yes	25-34
<i>M. tb</i>	S	S	S	S	R	No	Yes	25-34
<i>M. tb</i>	S	S	S	S	R	No	Yes	35-44
<i>M. tb</i>	R	S	S	S	S	No	Yes	25-34
<i>M. tb</i>	R	R	R	R	R	No	Yes	35-44
<i>M. tb</i>	R	S	S	S	S	No	Yes	45-54
<i>M. tb</i>	R	R	S	S	R	No	Yes	25-34
<i>M. tb</i>	S	S	S	S	R	No	Yes	25-34
<i>M. tb</i>	R	S	S	S	S	No	Yes	35-44
<i>M. tb</i>	R	S	S	S	S	Yes	Yes	35-44
<i>M. tb</i>	R	S	S	S	S	Yes	Yes	25-34
<i>M. tb</i>	R	R	R	R	S	Yes	Yes	55-64
<i>M. tb</i>	R	S	S	S	R	Unk	Yes	35-44
<i>M. tb</i>	R	R	R	R	R	No	Yes	25-34
<i>M. tb</i>	S	R	S	S	S	Unk	Yes	45-54
<i>M. tb</i>	R	R	S	R	R	No	Yes	25-34
<i>M. tb</i>	R	S	S	S		No	Yes	25-34
<i>M. tb</i>	S	S	S	R	S	No	No	45-54
<i>M. tb</i>	R	S	S	S	R	No	Unk	25-34
<i>M. tb</i>	R	S	S	S	S	No	Yes	25-34
<i>M. tb</i>	R	S	S	S	R	No	Yes	35-44
<i>M. tb</i>	R	R	S			Yes	Yes	35-44
<i>M. tb</i>	R	S	S	S	S	No	Yes	45-54
<i>M. tb</i>	S	S	S	R	S	No	Yes	25-34
<i>M. tb</i>	S	S	S	S	R	No	Yes	25-34
<i>M. tb</i>	S	S	S	S	R	No	No	25-34

\*\* This relates to TB cases with susceptibility results reported for at least isoniazid and rifampicin

†† MDR TB is defined as a TB case resistant to at least isoniazid and rifampicin with or without resistance to ethambutol and streptomycin.

## Chest X-ray

Of the 213 cases with a pulmonary component, 135 (63.4% of total cases) had X-ray findings consistent with active pulmonary TB ([table 10](#)).

**Table 10: Chest X-ray results of TB cases with a pulmonary component, Q1 – Q4 2016**

Chest X-ray	Number of TB cases	% Total
Active cavitary TB	53	24.9
Active non-cavitary TB	82	38.5
Inactive/old TB	5	2.3
Normal	10	4.7
Other	22	10.3
Pleural	8	3.8
Not done	1	0.5
Not reported	32	15.0
<b>Total</b>	<b>213</b>	<b>100.0</b>

## Previous history

During Q1 – Q4 2016, 22 cases (6.9% of total reported) reported a previous history of TB. Eight cases with a previous history of TB were born in Ireland and 13 were born outside of Ireland. The remaining case with a previous history of TB did not have country of birth reported. Year of previous TB diagnosis ranged from 1956 to 2014.

## HIV status

HIV status was reported for 122 (38.2%) TB cases in 2016. Four TB cases were reported as HIV positive (1.3% of total case, 3.3% of cases with known HIV status) while 118 cases were reported as HIV negative (37.0% of total case, 96.7% of cases with known HIV status).

## Outcome

Twenty cases died during 2016 (6.3% of total reported). TB was reported as the cause of death in six of these cases, eight deaths were not due to TB, coroner's reports were outstanding on two cases and cause of death was not reported for the remaining four cases.

### Outbreaks

Five TB outbreaks were reported to HPSC during Q1 –Q4 2016 (figure 4). These outbreaks comprised 19 cases of active TB, 15 of whom were hospitalised. No cases of latent TB infection associated with outbreaks were reported to HPSC in 2016. Two family outbreaks occurred in a private house with three cases and across an extended family with four cases. Two general outbreaks occurred in community settings with six and three cases respectively. The remaining general outbreak occurred in a private house among family and non-family members.

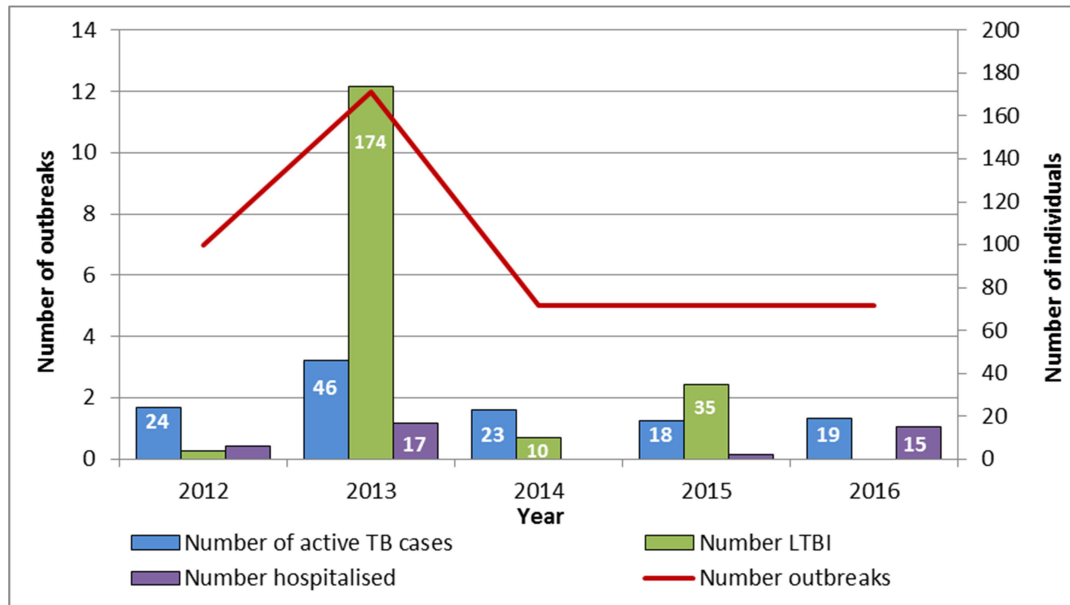


Figure 4: TB outbreak summary by year<sup>\*\*</sup>

<sup>\*\*</sup> Data for 2016 are provisional data only

**Appendix 1: TB notifications, 3 year moving average and crude incidence rate**

Year	Number of cases	3 year moving average - Cases	Crude rate per 100,000 population
1991	640		18.2
1992	604	612	17.1
1993	598	581	17.0
1994	524	526	14.5
1995	458	469	12.6
1996	434	436	12.0
1997	416	423	11.5
1998	424	433	11.7
1999	469	439	12.9
2000	395	410	10.1
2001	381	392	9.7
2002	410	402	10.5
2003	406	413	10.4
2004	433	430	10.2
2005	448	448	10.6
2006	463	464	10.9
2007	481	473	11.3
2008	467	474	11.0
2009	479	461	10.4
2010	420	433	9.2
2011	412	401	9.0
2012	358	376	7.8
2013	370	354	8.1
2014	313	325	6.8
2015	299	308	6.5
2016	319		7.0

Appendix 2: TB notifications, 3 year moving average and crude incidence rate

