
Tuberculosis

13

Key Points

- 318 cases of TB were notified in Ireland in 2016
- Two thirds of those diagnosed in 2016 had a pulmonary component
- Drug resistance was reported in 13.5% of cases in 2016
- The highest age specific incidence rate was in those aged 25-34 years followed by those aged 65 years and over
- BCG vaccine has not been available in Ireland since April 2015

Background

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. It is an airborne infection so most commonly affects the lungs but can affect any part of the body. Of the 318 cases notified in Ireland in 2016, two thirds had a pulmonary component¹. Some people with pulmonary TB can infect their close contacts.

Following infection, one of two clinical outcomes is possible: early development of active disease ('primary TB'), which occurs particularly in children and immunocompromised patients or latent TB infection (LTBI), which occurs in the majority of infected individuals. The lifetime risk of progressing to active TB from LTBI is 5–10% in the immunocompetent². A patient with infectious TB can infect 10-15 other close contacts over the course of a year³.

TB can affect anybody but it is strongly associated with social determinants of health, including migration, and social marginalisation such as homelessness, drug misuse and imprisonment. Medical, social and environmental conditions which

impair the immune system also increase the risk of active TB. These include HIV/AIDS, diabetes mellitus, chronic renal failure, use of immunosuppressive drugs, tobacco smoking and malignancy².

Compliance with treatment can be challenging, especially for those from marginalised groups in society and/or those with issues with alcohol, homelessness, drug addiction, or drug resistant infections.

TB is an important clinical and public health problem worldwide. In Ireland it is a notifiable infectious disease i.e. by law it must be reported to the Medical Officer of Health (MOH). An important public health and epidemiological issue is the emergence of drug-resistant TB. This includes resistance to single drugs, multi drug resistant TB (MDR-TB) and more recently, extensive drug-resistant TB (XDR-TB)². The only licensed vaccine against TB is BCG which is an attenuated strain of *Mycobacterium bovis* (*M. bovis* bacilli Calmette-Guérin)². It is effective in the prevention of meningitis and disseminated disease in children. Although listed on the schedule for childhood vaccinations, it has not been available in Ireland for over three years due to manufacturing supply issues.

Incidence

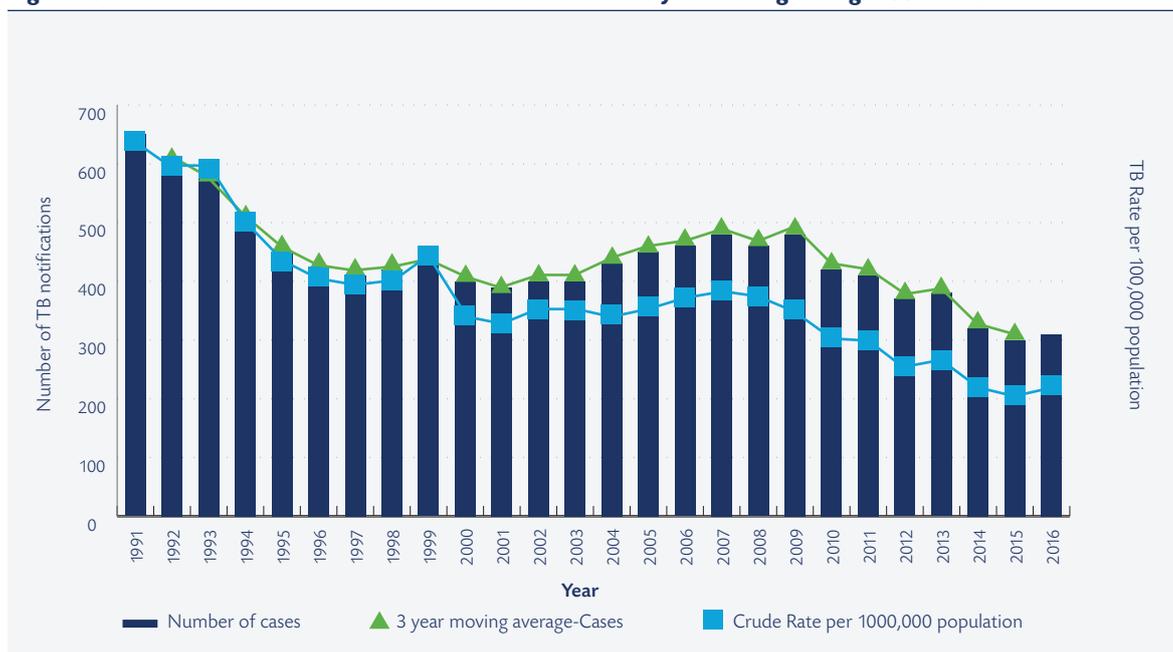
The number of cases of Tuberculosis (TB) notified over the past decade (2007-2016) to MOH in the Regional Public Health departments is shown in table 13.1.

Over the 10 year period (2007-2016) there has been a downward trend in notifications but this may now be levelling as evidenced by the crude rate/100,000 population shown in table 13.1 and the three year rolling average shown in figure 13.1 below.

Table 13.1. TB notifications Number and Rate/100,000 2007-2016

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|
| Numbers | 481 | 467 | 479 | 420 | 413 | 359 | 372 | 313 | 303 | 318 |
| Rate/100,000 population | 10.9 | 11 | 10.4 | 9.2 | 9 | 7.8 | 8.1 | 6.8 | 6.6 | 6.9 |

Source: Health Protection Surveillance Centre (HPSC)^{1,4}

Figure 13.1. Notified cases of TB in Ireland with crude rate and 3 year moving average 1991-2016

Source: Tuberculosis in Ireland: latest trends in surveillance data December 2017 (www.hpsc.ie HPSC)⁵

Table 13.2. Summary of the Epidemiology of TB in Ireland, 2016

| Parameter | cases | CIR | % of total cases |
|--------------------------------------|-------|------|------------------|
| Number of cases | 318 | 6.9 | - |
| Cases in indigenous population | 145 | 3.9 | 45.6 |
| Cases in foreign-born persons | 160 | 20.9 | 50.3 |
| Culture positive cases | 237 | 5.2 | 74.5 |
| Pulmonary cases | 211 | 4.6 | 66.4 |
| Smear positive Pulmonary cases | 85 | 1.9 | 26.7 |
| TB meningitis cases | 0 | 0 | 0 |
| Multi/Extensive drug resistant cases | 6 | 0.13 | 1.9 |
| Deaths attributable to TB | 7 | 0.2 | 2.2 |

Source: Adapted from table Summary of the Epidemiology of TB in Ireland, in HPSC Annual Epidemiological Report. 2017¹

In 2016, of the 318 cases notified, 211 (66.4%) had pulmonary involvement while 97 (30.5%) had exclusively extra-pulmonary disease. Three quarters (237, 74.5%) were culture positive. Of those with a pulmonary component at time of diagnosis, 85 (40.3%) were smear positive i.e. infectious¹. Of the cases notified in 2016, 49.2% were foreign born¹. In 2016, five outbreaks were reported comprising 19 active cases. In the same year there were 28 drug resistant cases including six MDR-TB or XDR-TB cases. These details are shown in table 13.2¹.

Mortality

In 2016, twenty people of the 318 notified cases died (6.3%). TB was reported as the cause of death for seven of these, for eight, TB was not the cause while details were not available on the remainder^{1,6}.

Impact on health services

Those with TB and their close contacts are managed by community, public health and hospital services. Section 38 of the 1947 Health Act allows for the detention of an infectious non-compliant patient. This Act is seldom invoked but if it is, it can have a significant impact on hospital and other health service resources. Even when not enacted, there can be a number of occasions when preliminary work to enact it is initiated.

Most people with TB are treated without hospital admission. Outpatient Department attendances are not available. In 2016, there were 262 hospitalisations for people with TB (including 50 day cases) with a use of 3,622 bed days (0.6% of respiratory bed days, 0.1% of all bed days). Almost three quarters (74%, 157) of the inpatient hospitalisations were in the 16-64 year age group.

Gender

The male: female ratio of 1.6:1 in 2016 was consistent with that reported in previous years¹. The highest age specific incidence rate (ASIR) among males was in those aged 65 years and over while for females it was 55-64 years¹.

Age

The trends for the decade 2007-2016 in terms of age-specific notification rates per year are shown in figure 13.2 below⁵.

In 2016, cases ranged in age from two months to 89 years with a median age of 41 years. While most cases (25.1%) were in the age group 25-34 years (ASIR 10.6), the highest age specific rate at 10.6 was in those aged 25-34 years followed by those aged 65 years and older (10.5)¹.

Cases that were Irish born had a median age of 54 years whereas those who were foreign born had a median age of 33 years¹.

Regional variation

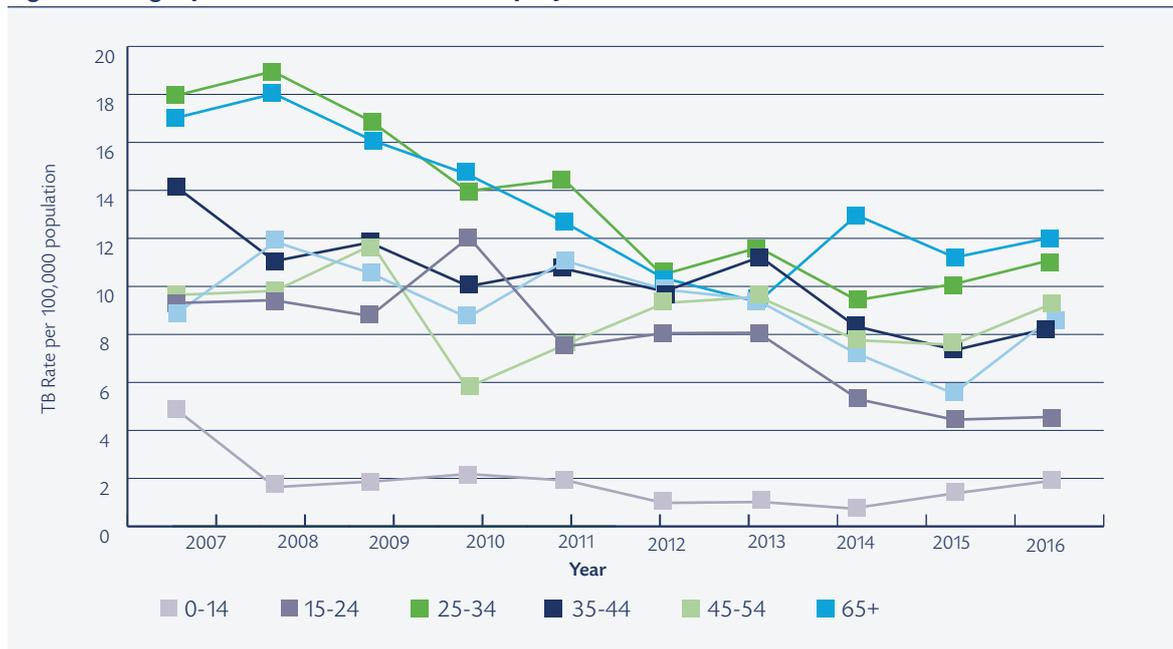
Figure 13.3 shows the notification rate by Health Service Executive (HSE) area for the years 2012-2016. In 2016, HSE East reported the highest number of cases at 136 (42.6% of total), with 36.4% of total cases being reported in Dublin⁵. HSE South with 51 cases (16.2% of total) was the region with the 2nd highest number of cases.

Socio-economic analysis

In 2016, of the 32 Local Health Office areas (LHOs) in Ireland, the two with the highest crude incidence rate (CIR) of Tuberculosis were both in HSE East. These were Dublin North West (27 cases, CIR 13.0) and Dublin North Central (20 cases, CIR 12.9)⁷. These are both areas of relatively high deprivation.

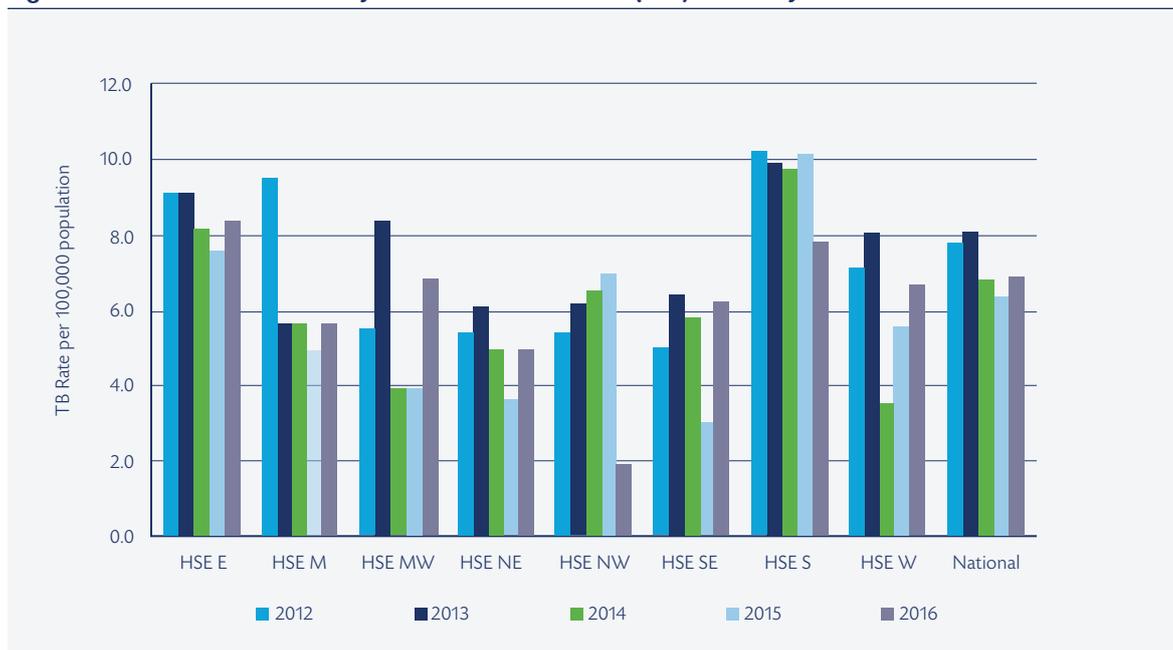
In addition to deprivation and social marginalisation, TB is strongly associated with factors such as migration. In 2016, 50.3% of those notified with TB in Ireland were foreign born¹. Figure 13.4 below reflects the trends in risk factors for the decade 2007-2016 in Ireland⁵.

Figure 13.2. Age-specific notifications rates of TB per year: 2007-2016



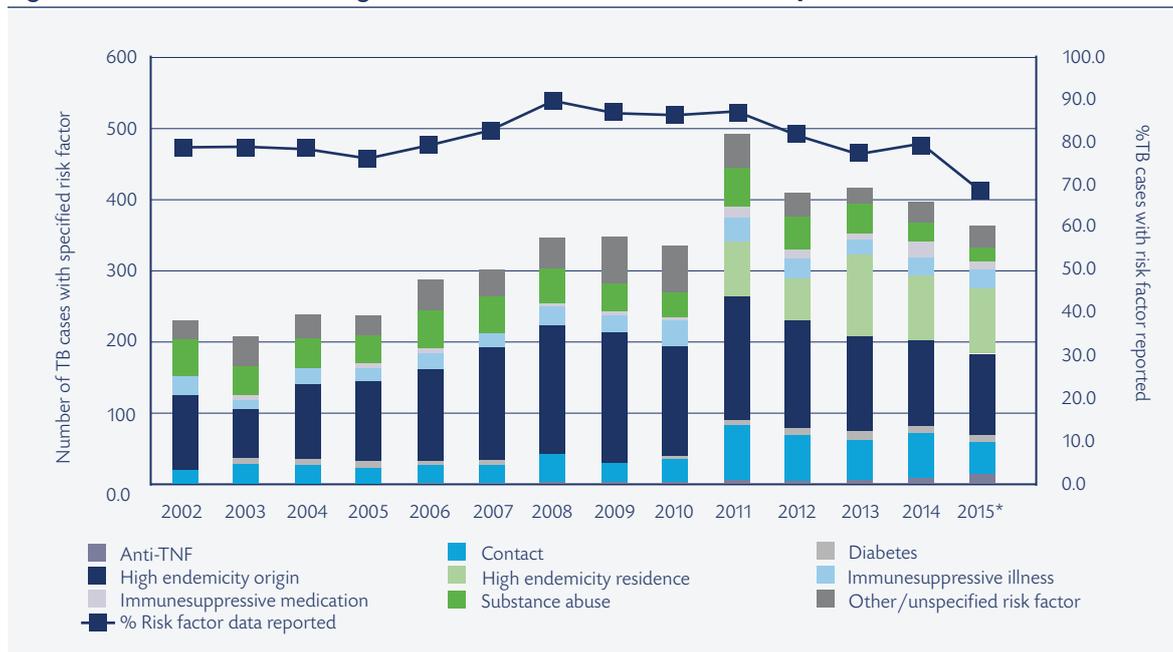
Source: Tuberculosis in Ireland: latest trends in surveillance data December 2017 (www.hpsc.ie HPSC)⁵

Figure 13.3. TB Notification Rate by Health Service Executive (HSE) area and year



Source: Tuberculosis in Ireland: latest trends in surveillance data December 2017 (www.hpsc.ie HPSC)⁵

Figure 13.4. Number and Percentage of TB notifications with TB risk factor reported



Source: Tuberculosis in Ireland: latest trends in surveillance data December 2017 (www.hpsc.ie HPSC)⁵

International comparisons

It is estimated that globally there were 10.4 million new cases of TB in 2016. Of these, an estimated 4.1% of new cases and 19% of previously treated cases had MDR/Rifampicin Resistant-TB - an increase since 2015⁸. In 2016, the WHO European Region reported 290,000 cases of TB, giving an overall notification rate 32.0 cases per 100,000, with a wide variation between countries and an incremental west-to-east gradient. The lowest rate in the region occurred in Western Europe (EU countries plus Iceland and Norway), with rates lower than 10 per 100,000 reported in a number of countries, including Ireland⁸.

Globally, although the TB mortality rate is falling at 3% per year, it remains a leading cause of death. In the five years 2012–2016, TB was the leading cause of death from a single infectious agent. In 2016, there were an estimated 1.3 million deaths from TB among HIV-negative people and an additional 374,000 deaths from TB among HIV-positive people⁸.

The relative concentration of TB in urban areas observed in Ireland is also observed elsewhere in Europe where large cities have notification rates twice as high as rates seen in other parts of the country⁹. In 2016, there were, as in previous years, more males than females notified in Europe as well as in Ireland which may in part be due to differences in risk factors¹⁰.

In 2016, of cases of TB reported in EU/EEA countries, 32.7% were foreign-born, but this ranged from 0.2% to 96.0% of cases¹⁰. The Irish figure was 50.3%.

The highest burden of MDR-TB cases in the WHO European region is in the non-EU European and central Asian countries with a rate of 36% in 2016. Over the region as a whole, the proportion of culture confirmed pulmonary cases with MDR-TB was 29.1%. The proportion reported in the EU/EEA in 2016 was 3.7% of cases with drug susceptibility testing (DST) results¹⁰. Extensively drug-resistant (XDR) TB was reported for 20.1% of 984 MDR TB cases tested for second line drug susceptibility¹⁰. In Ireland in 2016, 1.9% of cases were MDR or XDR TB.

In the EU/EEA in 2016, data on HIV co-infection was incomplete. Of all TB cases with known HIV status, 4.5% were co-infected with the virus¹⁰. In 2016 in Ireland, HIV status was recorded for 131 (41.2%) of cases of whom less than 5 were HIV positive.

TB in prisons is poorly reported in the EU/EEA. For the 18 EU/EEA countries reporting data in 2016, the notification rate was 163.8 per 100,000 inmates i.e. an incidence ratio of 11.1 compared to the general population in the same countries¹⁰.

References

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