

Health Protection Surveillance Centre



Report on the Epidemiology of
Tuberculosis in Ireland 2005

Epidemiology of Tuberculosis in Ireland 2005

A Report by the
Health Protection Surveillance Centre



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

October 2007



ISSN 1649-1106

Table of Contents

Acknowledgements	3
Introduction	4
Case Definitions	5
Methods	6
Data collection	6
Data analysis	6
Results: TB Cases in Ireland, 2005	7
Overall cases and rates	7
Crude incidence rates by HSE area	8
Age and sex distribution	9
Age-standardised TB incidence rates	11
Geographic origin	15
Site of disease	18
Bacteriological results	20
Treatment outcome	22
Case ascertainment	22
Previous history of TB	22
HIV status	22
Discussion	23
Conclusions	25
References	26
Appendix 1: TB Cases Notified in 2006, Provisional Data	27
Appendix 2: Social class	29
Appendix 3: BCG Vaccination	30
Index of Tables and Figures	32

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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Introduction

The World Health Organisation (WHO) has estimated that globally, there were 8.8 million new cases of tuberculosis (TB) in 2005, of which 3.9 million were smear positive. Approximately 1.6 million TB deaths occurred in 2005.¹

In 2005, 426,717 cases of TB were notified by 51 of the 53 countries of the WHO European region to EuroTB.² The overall notification rate was 48.0 cases per 100,000 population with very diverse epidemiological situations evident across the region. Figure 1 displays a map of TB notification rates in the WHO European region.

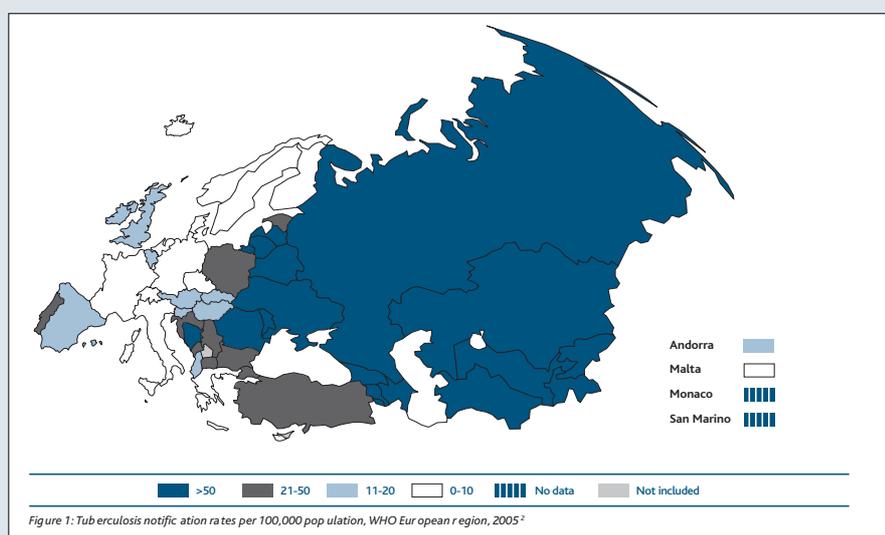
The lowest rate in the region occurred in Western Europe (EU countries plus Andorra, Iceland, Israel, Monaco, Norway, San Marino and Switzerland) at 18.3/100,000 where TB notification rates have decreased by 2.5% each year between 2001 and 2005. Rates were lower than 10 per 100,000 in 16 countries and higher than 20 per 100,000 in the Baltic States – Lithuania (75), Latvia (63) and Estonia (39), as well as Portugal (34), Bulgaria (43), Poland (24) and Romania (135). The notification rate was much higher in Romania than other countries (range 3.7 to 75 per 100,000). In the EU and Western Europe, 78% of cases were nationals of the country of report, 19% were of foreign origin, reaching 40% or more in 17 countries. Multi-drug resistance (MDR) remained more frequent in the Baltic States with a mean of 18% (country range: 15 to 20%) compared to a mean of 2% (0 to 6%) in the other countries.

The seven Balkan countries in Central Europe (Albania, Bosnia and Herzegovina, Croatia, F.Y.R. of Macedonia, Montenegro, Serbia and Turkey) reported 27,573 cases of TB in 2005, corresponding to an overall notification rate of 29.1/100,000. Drug resistance data from these countries indicated low levels of drug resistance.

In 2005, 306,015 cases were reported from Eastern Europe (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Rep. of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan), of which 51% were from the Russian Federation. The Russian Federation is the only European country which features in the WHO list of 22 high TB-burden countries in the world. The overall notification rate in Eastern Europe was 110.2/100,000 and has increased on average by 4.3% yearly between 2001 and 2005. Data on drug resistance in recent years suggest high levels of MDR in most countries in this region.

In Ireland, national epidemiological data on TB have been collated by the Health Protection Surveillance Centre (HPSC) since 1998. From January 2000, this information has included enhanced surveillance data items based on the minimum dataset reported to EuroTB. The resulting National Tuberculosis Surveillance System (NTBSS) was set up following consultation with the eight former health boards and the National TB Advisory Committee. The National TB Advisory Committee was reconvened in October 2004.

This report presents an epidemiological review of all TB cases notified in 2005. Data for 2005 have been validated and updated to include information relating to treatment outcome. Provisional data for 2006 are presented in Appendix 1.



Case Definitions

Case Definitions

The case definitions used for the analyses described in this report were those recommended by the National TB Working Party (1996).³

- **A notified case** of TB referred to clinically active disease due to infection with organisms of the *Mycobacterium tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*, *M. microti* or *M. canetti*). Active disease was presumed if the patient was commenced on a full curative course of anti-tuberculosis chemotherapy. Persons placed on chemoprophylaxis for preventive treatment or infected by *Mycobacterium* other than *M. tuberculosis* complex were not included as cases.
- **A definite case** of tuberculosis was a case with culture-confirmed disease due to *M. tuberculosis* complex.
- **An other than definite case** met both of the following conditions: (1) it was the clinician's judgement that the patient's clinical and/or radiological signs and/or symptoms were compatible with tuberculosis and (2) the physician took the decision to treat the patient with a full course of anti-tuberculosis therapy.
- **Pulmonary TB** was defined as TB of the lung parenchyma or the tracheo-broncheal tree which was either a laboratory-confirmed case - with a positive smear, histology or culture - with or without radiological abnormalities consistent with active pulmonary TB or a case where the physician took the decision that the patient's clinical symptoms and/or radiological signs were compatible with pulmonary TB. The WHO defines pulmonary TB, for the purpose of analysis, as any case that has a pulmonary disease component.
- **Extra-pulmonary TB** was defined as a patient with a smear, culture, or histology specimen, from an extra-pulmonary site that was positive for *M. tuberculosis* complex or a case with clinical signs of active extra-pulmonary disease in conjunction with a decision taken by the attending physician to treat the patient with a full curative course of anti-tuberculosis chemotherapy.
- **Pulmonary and extra-pulmonary TB** was a case of tuberculosis that met the previous two definitions.
- **Smear positive case** was defined as a patient with at least two sputum specimens positive for acid-fast bacilli by microscopy; or a patient with at least one sputum specimen positive for acid-fast bacilli and radiographic abnormalities consistent with active tuberculosis; or a patient with at least one sputum specimen positive for acid-fast bacilli, which is culture positive for *M. tuberculosis*.
- **A recurrent case** was defined as a patient with a documented history of TB prior to their 2005 notification.
- **Multi-drug resistance (MDR)** was defined as resistance to at least isoniazid and rifampicin with or without resistance to ethambutol and streptomycin.
- **Extensively Drug Resistant TB (XDR-TB)** is defined as a TB strain resistant to any fluoroquinolone and at least one of three injectable second-line drugs (capreomycin, kanamycin and amikacin), in addition to MDR-TB. This definition of XDR-TB was agreed by the WHO Global Task Force on XDR-TB in October 2006.⁴

Methods

Data collection

An enhanced TB notification form was completed by public health doctors for each case of TB notified in 2005. These forms summarise all available clinical, microbiological, histological and epidemiological data. Forms were then collated in the regional departments of public health, where data were entered onto an Epi2000 database (NTBSS). Each HSE area provided finalised 2005 data with outcome information to HPSC in early to mid 2007. Data were validated with each area and national data were collated. Provisional 2006 data were obtained from each area in August 2007.

Data analysis

National TB data from 1992 to 1997 were provided by the Department of Health and Children (DoHC). National TB data from 1998 onwards were obtained from the NTBSS system.

Rates for 1991, 1992 and 1993 are based on the 1991 population census; rates for 1994, 1995, 1996, 1997, 1998 and 1999 are based on the 1996 population census; rates for 2000, 2001, 2002 and 2003 are based on the 2002 population census and rates for 2004, 2005 and 2006 are based on the 2006 population census. For the calculation of rates in the indigenous and foreign-born population, population data were taken from table 32, volume 4, 2006 census, 'persons usually resident in each province and county, and present in the state on census night, classified by place of birth'. The indigenous population was defined as those persons who were born in Ireland.⁶

Direct methods of standardisation were used to allow comparison of rates between geographical areas using the 2006 Irish population as the standard population. In order to compare rates between groups of interest, 95% confidence intervals were used.

Three-year moving averages were calculated by applying the formula $(a+2b+c)/4$ to each three successive points a, b and c (each letter representing a year) in the series. They are useful for smoothing irregularities in trend data and make it easier to discern long-term trends that otherwise might be obscured by short-term fluctuations.

Where available, analysis was performed using community care area (CCA) rather than local health office (LHO) as the LHOs did not come into operation until 1st September 2005.

Results: TB cases in Ireland, 2005

Overall cases and rates

There were 450 cases of TB notified in 2005. This represents a rate of 10.6/100,000 population. A summary of the 2005 data is shown in table 1.

Table 1: Summary of the epidemiology of TB in Ireland, 2005

Parameter	Number
Total number of cases	450
Crude notification rate per 100,000	10.6
Cases in indigenous population*	297
Cases in foreign-born persons*	152
Culture positive cases	283
Smear positive pulmonary cases	178
Mono-resistant to isoniazid	9
Multi-drug resistant cases	2
Extensively-drug resistant cases	1
Deaths attributable to TB	10
Outcomes reported in cases	392
TB meningitis cases	9

*Country of birth not available for one case

The number of TB cases notified for each of the years from 1991-2005 is shown in table 2. Crude incidence rates from 1991 to 2005 with three-year moving averages are also shown in table 2.

Table 2: Notified cases of TB in Ireland 1991-2005 with crude rates per 100,000 population and 3-year moving averages 1992-2004

Year	Number of cases	Crude rate per 100,000 population	3-year moving average
1991	640	18.2	
1992	604	17.1	612
1993	598	17.0	581
1994	524	14.5	526
1995	458	12.6	469
1996	434	12.0	436
1997	416	11.5	423
1998	424	11.7	433
1999	469	12.9	439
2000	395	10.1	410
2001	381	9.7	391
2002	408	10.4	401
2003	407	10.4	414
2004	432	10.2	430
2005	450	10.6	

Crude incidence rates by HSE area

The total number of TB cases in each HSE area is shown in table 3 with crude incidence rates and 95% confidence intervals included. The highest crude rate was reported in HSE MW at 14.7/100,000 population. The next highest rates were reported in HSE E (13.0), HSE S (12.2) and HSE W (10.9). The rates in HSE NE (3.3), HSE NW (6.3) and HSE M (6.4) were significantly lower than the national rate.

The crude incidence rates seen in each HSE area from 1992 to 2005 are shown in table 4 while the 3-year moving average TB notification rates for each HSE area from 1992 to 2004 are shown in table 5.

Table 3: Notified TB cases by HSE area, 2005

HSE area	Cases	Crude rate per 100,000	95% CI for rate
HSE E	195	13.0	11.0 - 14.5
HSE M	16	6.4	3.2 - 9.5
HSE MW	53	14.7	10.7 - 18.6
HSE NE	13	3.3	1.5 - 5.1
HSE NW	15	6.3	3.1 - 9.5
HSE SE	37	8.0	5.4 - 10.6
HSE S	76	12.2	9.5 - 15.0
HSE W	45	10.9	7.7 - 14.0
Ireland	450	10.6	9.7 - 11.6

Table 4: Crude TB incidence rates per 100,000 population by HSE area, 1992-2005

Year	HSE E	HSE M	HSE MW	HSE NE	HSE NW	HSE SE	HSE S	HSE W	Total
1992	16.1	18.7	20.9	10.0	15.9	12.3	21.4	22.2	17.1
1993	11.9	10.8	16.1	10.0	37.5	16.7	23.9	23.0	17.0
1994	12.9	14.6	17.3	11.4	9.0	11.0	17.4	22.7	14.5
1995	11.9	8.8	15.1	8.5	11.4	9.5	20.5	11.1	12.6
1996	8.7	8.3	17.7	12.1	7.1	6.9	22.5	13.1	12.0
1997	9.9	9.2	12.6	9.1	10.4	12.8	16.5	11.1	11.5
1998	11.7	4.9	14.8	9.5	9.0	8.9	14.3	15.3	11.7
1999	13.9	7.3	17.0	8.2	9.0	7.9	13.7	19.9	12.9
2000	10.2	7.1	13.8	6.1	4.1	9.7	13.8	10.0	10.1
2001	12.3	3.1	7.1	11.0	5.9	4.7	12.4	8.9	9.7
2002	11.6	8.4	9.4	7.0	5.4	11.6	13.3	8.7	10.4
2003	11.9	5.3	12.4	7.5	4.1	8.3	16.0	6.0	10.4
2004	12.6	3.6	12.2	5.8	6.7	7.4	11.8	10.6	10.2
2005	13.0	6.4	14.7	3.3	6.3	8.0	12.2	10.9	10.6

Table 5: 3-year moving average TB notification rate per 100,000 population by HSE area, 1992-2004

Year	HSE E	HSE M	HSE MW	HSE NE	HSE NW	HSE SE	HSE S	HSE W	Total
1992	14.7	16.1	20.3	10.1	20.2	12.6	21.7	26	17.3
1993	13.2	13.7	17.6	10.4	24.9	14.2	21.6	22.7	16.4
1994	12.4	12.2	16.5	10.3	16.7	12.0	19.8	19.9	14.6
1995	11.3	10.1	16.3	10.1	9.7	9.2	20.2	14.5	12.9
1996	9.8	8.6	15.8	10.5	9.0	9.0	20.5	12.1	12.0
1997	10.1	7.9	14.4	10.0	9.2	10.3	17.4	12.6	11.7
1998	11.8	6.6	14.8	9.1	9.4	9.6	14.7	15.4	11.9
1999	12.4	6.6	15.7	8.0	7.8	8.6	13.9	16.3	11.9
2000	11.7	6.2	12.9	7.8	5.8	8.0	13.4	12.2	10.7
2001	11.6	5.4	9.3	8.8	5.3	7.7	13.0	9.1	10.0
2002	11.8	6.3	9.6	8.1	5.2	9.0	13.7	8.1	10.2
2003	12.0	5.7	11.6	7.0	5.1	8.9	14.3	7.8	10.3
2004	12.5	4.7	12.9	5.6	6.0	7.8	12.9	9.5	10.3

Age and sex distribution

There were 269 (59.8%) cases of TB notified in males in 2005 and 181 (40.2%) in females, giving a male to female ratio of 1.5:1. Table 6 gives the breakdown of notified TB cases by sex and HSE area.

In 2005, the mean age of cases was 42.5 years (range 1 year to 96 years). Age was reported for all cases. Ninety four cases (20.9%) were aged between 25 and 34 years and 89 cases (19.8%) were aged 65 years and over. Table 7 describes the age-specific rates for males and females in 2005. Rates in males were higher than females in all age groups. Figure 2 shows the cases by age and sex and the male and female age-specific rates in Ireland for 2005. Figure 3 shows the age-specific rates of TB in Ireland from 2000 to 2005.

Table 6: TB cases by HSE area and sex, 2005

HSE area	Males	Females	Male:female ratio
HSE E	121	74	1.6
HSE M	9	7	1.3
HSE MW	36	17	2.1
HSE NE	9	4	2.3
HSE NW	9	6	1.5
HSE SE	17	20	0.9
HSE S	45	31	1.5
HSE W	23	22	1.0
Ireland	269	181	1.5

Table 7: Age-specific TB rates per 100,000 population for males and females 2005

AgeGroup (years)	Female	Male	Total
0-14	2.8	3.6	3.2
15-24	9.6	13.1	11.4
25-34	11.8	14.2	13.0
35-44	5.5	17.1	11.4
45-54	8.1	12.6	10.3
55-64	6.9	13.6	10.3
65+	17.3	21.2	19.0
Total	8.5	12.7	10.6

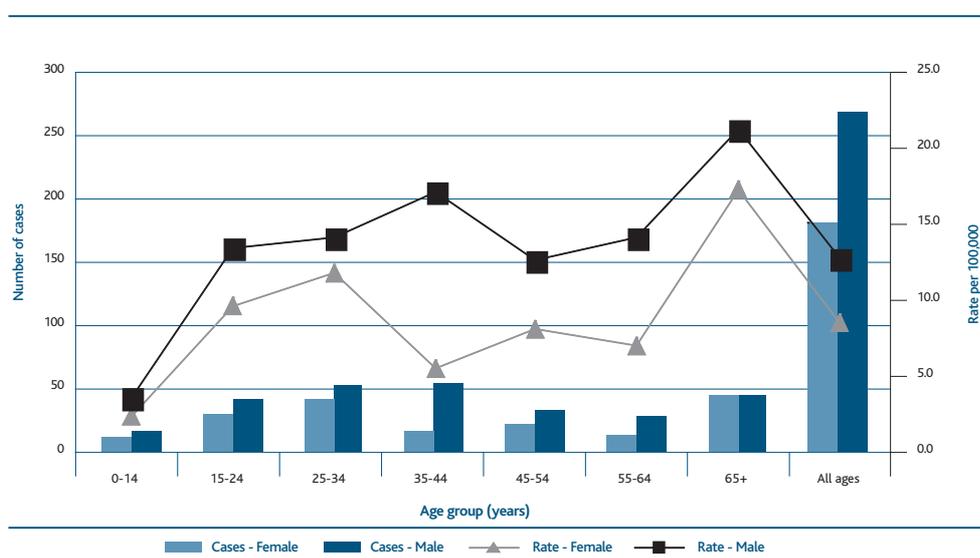


Figure 2: Cases of TB by age and sex, and age-specific rates per 100,000 population, 2005

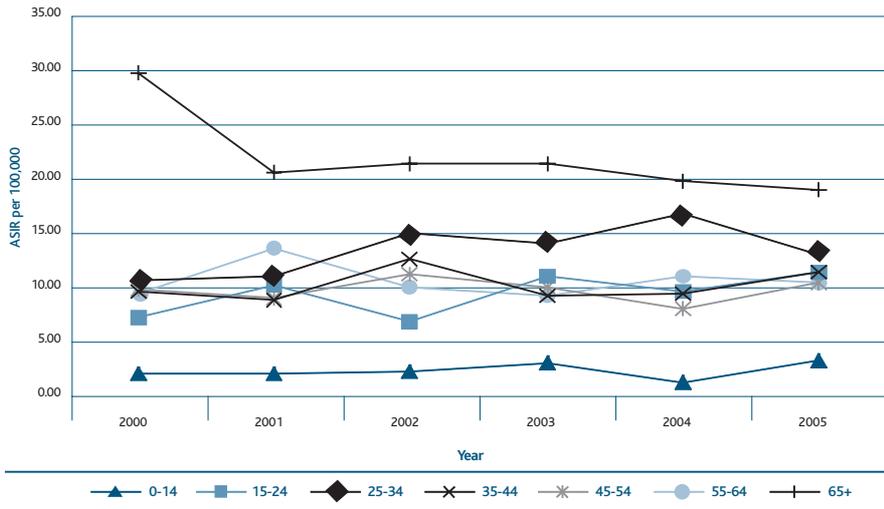


Figure 3: Age-specific rates of TB by year, 2000-2005

Age-standardised TB incidence rates by HSE area, county and CCA

Age-standardised TB incidence rates for each HSE area are presented in figures 4 and 5 (figure 4 includes 95% confidence intervals).

The highest age-standardised TB incidence rates were seen in HSE MW at 14.6/100,000 population, followed by HSE E (12.7) and HSE S (12.2). HSE NE reported the lowest age-standardised rate at 3.4/100,000 population which was significantly lower than the national incidence rate (10.6/100,000 population).

Age-standardised incidence rates for each county are shown in table 8 and figure 6 (95% confidence intervals are included in table 8). Clare had a significantly higher rate (20.0) than the national figure (10.6). Counties with significantly lower incidence rates than the national rate were Kilkenny (2.2), Louth (1.8) and Meath (1.7).

Crude incidence rates for each community care area (CCA)* in 2005 are shown in table 9. Three-year moving averages for the crude incidence rates are presented in table 10. In 2005, the highest crude rates per 100,000 population were in CCA7 (24.5) and CCA3 (20.1) in HSE E, and North Lee (21.5) in HSE S. The highest 3-year moving average rates between 2003 and 2005 were in CCAs 3, 5, 6 and 7 in HSE E, North and South Lee in HSE S, and Roscommon in HSE W.

* Note: LHOs came into operation 1st September 2005, taking over operations from CCAs

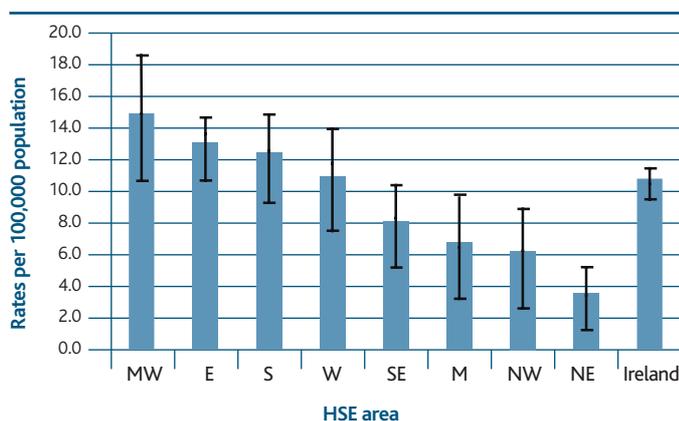


Figure 4: Age-standardised TB incidence rates per 100,000 population by HSE area with 95% confidence intervals, 2005.

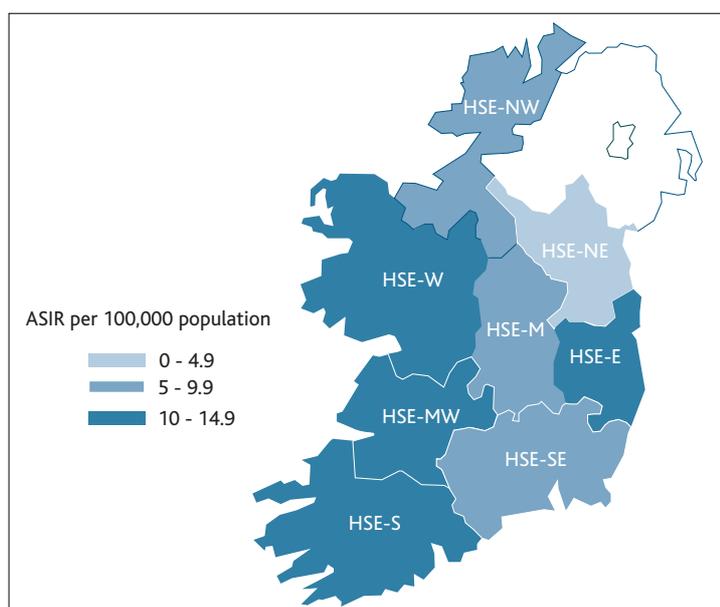


Figure 5: Age-standardised TB incidence rates per 100,000 population by HSE area, 2005

Table 8: Age-standardised TB incidence rates per 100,000 population by county with 95% confidence intervals, 2005

County	ASIR per 100,000	95% CI
Clare	20.0	11.6 - 28.4
Leitrim	17.9	2.0 - 33.7
Tipperary Sth‡	14.6	6.3 - 22.9
Limerick	14.2	8.7 - 19.7
Dublin	14.1	12.0 - 16.2
Cork	13.9	10.6 - 17.3
Carlow	12.2	2.4 - 22.0
Roscommon	11.9	2.9 - 21.0
Galway	11.4	7.0 - 15.8
Longford	11.3	0.2 - 22.5
Kildare	10.1	5.0 - 15.3
Waterford	10.0	4.1 - 15.9
Mayo	9.1	3.9 - 14.3
Westmeath	7.9	1.6 - 14.2
Tipperary Nth‡	7.4	0.9 - 13.9
Monaghan	7.3	0.1 - 14.5
Kerry	6.1	2.1 - 10.1
Cavan	5.9	0.1 - 11.7
Offaly	5.8	0.1 - 11.6
Sligo	5.7	0.1 - 11.3
Wicklow	4.9	1.0 - 8.8
Wexford	4.3	0.9 - 7.7
Donegal	4.0	0.8 - 7.2
Laois	3.0	-1.2 - 7.2
Kilkenny	2.2	-0.9 - 5.3
Louth	1.8	-0.7 - 4.3
Meath	1.7	-0.2 - 3.6

‡ The overall rate for Tipperary was 11.4 per 100,000 population

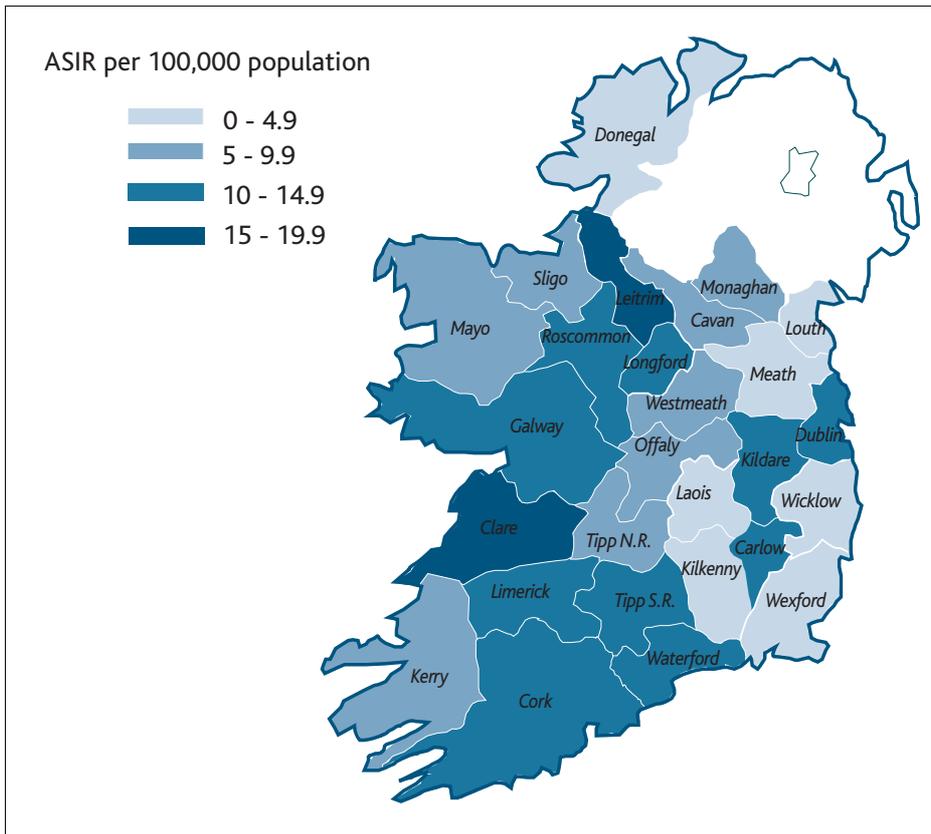


Figure 6: Age-standardised TB incidence rates per 100,000 population by county, 2005

Table 9: Crude incidence rate per 100,000 population by community care area (CCA), 2000 to 2005[†]

HSE area	CCA	Rate per 100,000 population					
		2000	2001	2002	2003	2004	2005
HSE E	Total	10.2	12.3	11.6	11.9	12.6	13.0
	1	5.4	2.3	4.7	4.7	9.5	4.0
	2	13.3	5.7	7.6	7.6	10.9	7.2
	3	7.7	26.1	21.5	23.0	23.1	20.1
	4	6.9	8.2	7.5	10.3	8.1	12.2
	5	11.9	10.3	18.3	19.1	20.1	18.7
	6	16.8	18.7	23.0	17.4	12.9	19.4
	7	18.8	27.8	18.8	21.2	25.3	24.5
	8	10.8	11.8	5.4	4.9	11.3	10.4
	9	5.0	5.0	7.8	8.4	5.4	7.9
	10	5.0	8.0	1.0	5.0	2.7	5.5
HSE M	Total	7.1	3.1	8.4	5.3	3.6	6.4
	Longford/Westmeath	8.7	6.8	7.8	7.8	4.4	8.8
	Laois/Offaly	5.7	0.0	9.0	3.3	2.9	4.4
HSE MW	Total	13.8	7.1	9.4	12.4	12.2	14.7
	Clare	11.6	5.8	9.7	6.8	10.8	19.8
	Limerick*	na	na	na	na	na	na
	Tipperary Nth/East Limerick*	na	na	na	na	na	na
HSE NE	Total	6.1	11.0	7.0	7.5	5.8	3.3
	Cavan/Monaghan	3.1	16.7	6.3	10.4	4.2	5.1
	Louth/Sth Monaghan	11.4	8.8	10.5	9.6	9.0	3.6
	Meath	3.7	9.0	4.5	3.7	4.9	1.8
HSE NW	Total	4.1	5.9	5.4	4.1	6.7	6.3
	Donegal	2.9	3.6	4.4	2.9	6.8	4.1
	Sligo/Leitrim	5.9	9.4	7.0	5.9	6.6	9.9
HSE SE	Total	9.7	4.7	11.6	8.3	7.4	8.0
	Carlow/Kilkenny	13.5	8.1	8.1	9.0	7.5	6.6
	Tipperary Sth	10.7	2.4	4.7	9.5	7.9	13.6
	Waterford	12.6	7.2	23.3	11.7	13.3	9.2
	Wexford	2.6	0.9	8.6	3.4	1.5	4.6
HSE S	Total	13.8	12.4	13.3	16.0	11.8	12.2
	Kerry	8.3	6.8	10.6	12.1	10.0	6.4
	North Cork	21.8	9.5	15.0	10.9	12.4	6.2
	North Lee	16.7	21.8	18.6	22.4	14.9	21.5
	South Lee	10.7	10.7	12.5	19.7	11.2	11.7
	West Cork	13.8	7.9	3.9	2.0	7.8	9.3
HSE W	Total	10.0	8.9	8.7	6.0	10.6	10.9
	Galway	10.5	10.0	5.7	5.3	9.9	11.2
	Mayo	8.5	4.3	10.2	8.5	7.2	9.7
	Roscommon	11.2	14.9	16.7	3.7	20.4	11.9
Total	10.7	10.4	11.1	11.1	10.2	10.6	

[†] In some areas, CCA does not always correspond to county.

* Rates cannot be calculated for these CCAs as the population in the CCA is not known.

Table 10: 3-year moving average TB notification rate per 100,000 population by CCA†

HSE area	CCA	2001	3-year moving average		2004
			2002	2003	
HSE E	Total	11.6	11.8	12.0	12.5
	1	3.7	4.1	5.9	6.9
	2	8.1	7.1	8.4	9.1
	3	20.3	23.0	22.6	22.3
	4	7.7	8.4	9.1	9.7
	5	12.7	16.5	19.2	19.5
	6	19.3	20.6	17.7	15.7
	7	23.3	21.6	21.6	24.1
	8	9.9	6.9	6.6	9.4
	9	5.7	7.3	7.5	6.8
	10	5.5	3.8	3.4	4.0
HSE M	Total	5.4	6.3	5.7	4.7
	Longford/Westmeath	7.5	7.5	6.9	6.3
	Laois/Offaly	3.7	5.3	4.6	3.4
HSE MW	Total	9.3	9.6	11.6	12.9
	Clare	8.2	8.0	8.5	12.1
	Limerick*	na	na	na	na
	Tipperary Nth/East Limerick*	na	na	na	na
HSE NE	Total	8.8	8.1	7.0	5.6
	Cavan/Monaghan	10.7	9.9	7.8	6.0
	Louth/Sth Monaghan	9.9	9.9	9.7	7.8
	Meath	6.5	5.4	4.2	3.8
HSE NW	Total	5.3	5.2	5.1	6.0
	Donegal	3.6	3.8	4.2	5.1
	Sligo/Leitrim	7.9	7.3	6.3	7.2
HSE SE	Total	7.7	9.0	8.9	7.8
	Carlow/Kilkenny	9.4	8.3	8.4	7.6
	Tipperary Sth	5.0	5.3	7.9	9.7
	Waterford	12.6	16.4	15.0	11.9
	Wexford	3.2	5.4	4.2	2.8
HSE S	Total	13.0	13.7	14.3	12.9
	Kerry	8.1	10.0	11.2	9.6
	North Cork	13.9	12.6	12.3	10.5
	North Lee	19.7	20.3	19.6	18.4
	South Lee	11.2	13.9	15.8	13.4
	West Cork	8.4	4.4	3.8	6.6
HSE W	Total	9.1	8.1	7.8	9.5
	Galway	9.1	6.7	6.5	9.1
	Mayo	6.8	8.3	8.6	8.2
	Roscommon	14.4	13.0	11.1	14.1
Total		10.6	10.9	10.8	10.5

† In some areas, CCA does not always correspond to county.

* Rates cannot be calculated for these CCAs as the population in the CCA is not known.

Geographic origin

Of the 450 patients diagnosed with TB in 2005, 297 (66.0%) were born in Ireland, 152 (33.8%) were born outside Ireland and for the remaining one case, the country of birth was unknown. The crude TB rate in the indigenous population was 8.3/100,000 while the crude rate in the foreign-born population was 24.8/100,000.

Figure 7 shows TB cases by geographic origin from 1998 to 2005. Table 11 shows the breakdown of TB cases by HSE area and geographic origin.

Cases born outside Ireland originated from at least 39 countries. Table 12 shows the breakdown of these cases by country of birth and corresponding continent (as specified by EuroTB).² The exact country of birth was unknown for 20 of the cases born outside Ireland.

Figure 8 shows the age distribution of cases notified in 2005 by geographic origin. The majority (84.9%) of cases born outside Ireland were aged between 15 and 44 years with a median age of 29 years. The median age of those born in Ireland was 50 years with 40.7% of the cases aged greater than 55 years. Figure 9 shows TB cases by age group (years) and age-specific rates by geographic origin during 2005.

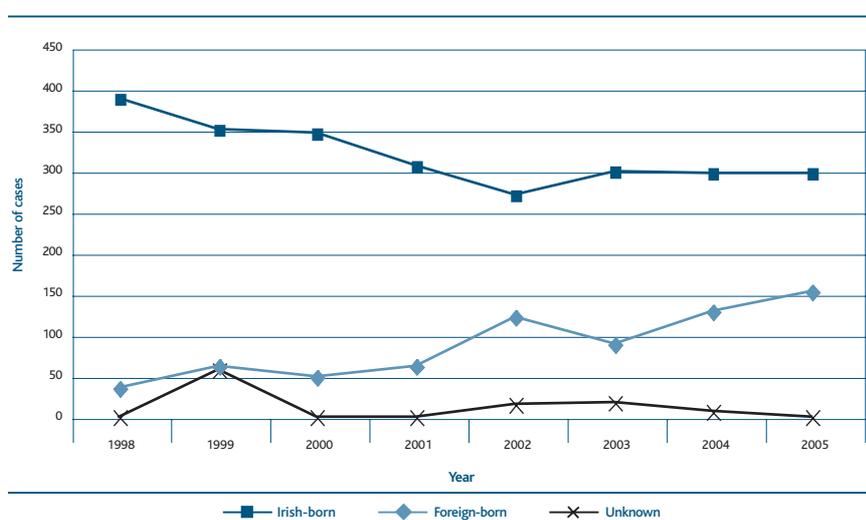


Figure 7: TB cases by geographic origin, 1998 to 2005

Table 11: Cases of TB by HSE area and geographic origin, 2005

HSE area	Irish-born	Foreign-born	Unknown	Total
HSE E	117	78	0	195
HSE M	5	11	0	16
HSE MW	38	15	0	53
HSE NE	10	2	1	13
HSE NW	8	7	0	15
HSE SE	30	7	0	37
HSE S	59	17	0	76
HSE W	30	15	0	45
Ireland	297	152	1	450

Table 12: Countries of origin of foreign-born patients with TB, 2005

Continent	Total	Country	Cases
Africa	34	Congo	2
		Ethiopia	3
		Ivory Coast	2
		Kenya	2
		Malawi	1
		Morocco	1
		Nigeria	7
		Somalia	7
		South Africa	2
		Sudan	3
		Uganda	1
		Zaire	1
		Zimbabwe	1
		Unknown	1
America	1	USA	1
Asia	70	Azerbaijan	1
		Bangladesh	3
		China	7
		Hong Kong	3
		India	25
		Indian subcontinent	1
		Indonesia	1
		Malaysia	2
		Mongolia	2
		Pakistan	11
		Philippines	12
		Vietnam	1
		Unknown	1
Europe	29	Czech Republic	1
		Germany	2
		Greece	1
		Italy	1
		Jersey	1
		Latvia	1
		Lithuania	3
		Moldova	1
		Poland	3
		Romania	5
		Russia	1
		Slovakia	1
		United Kingdom	8
Oceania	1	Australia	1
Unknown	17		17
Total	152		152

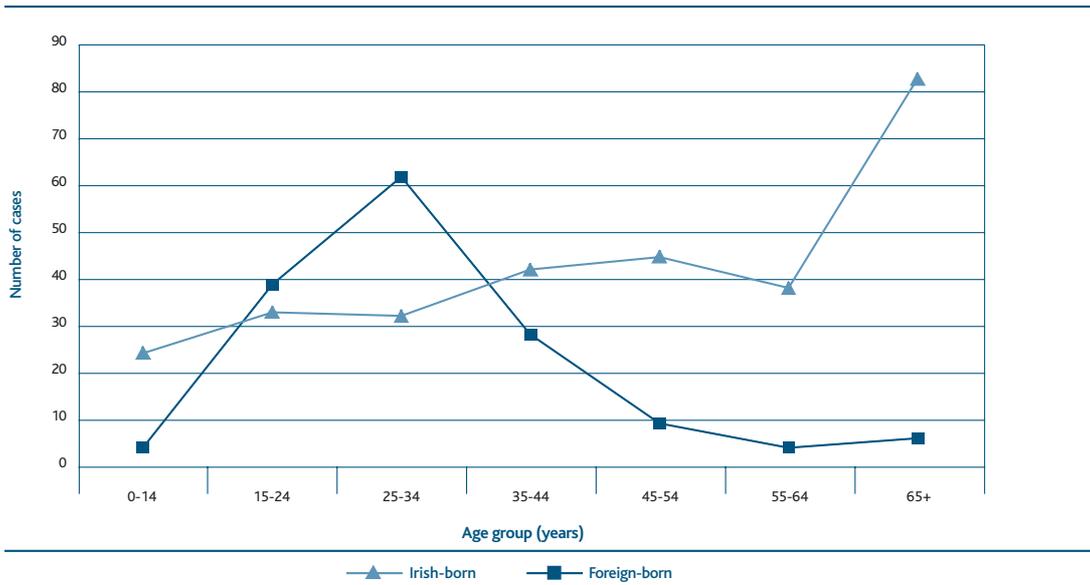


Figure 8: TB cases by age group and geographic origin, 2005

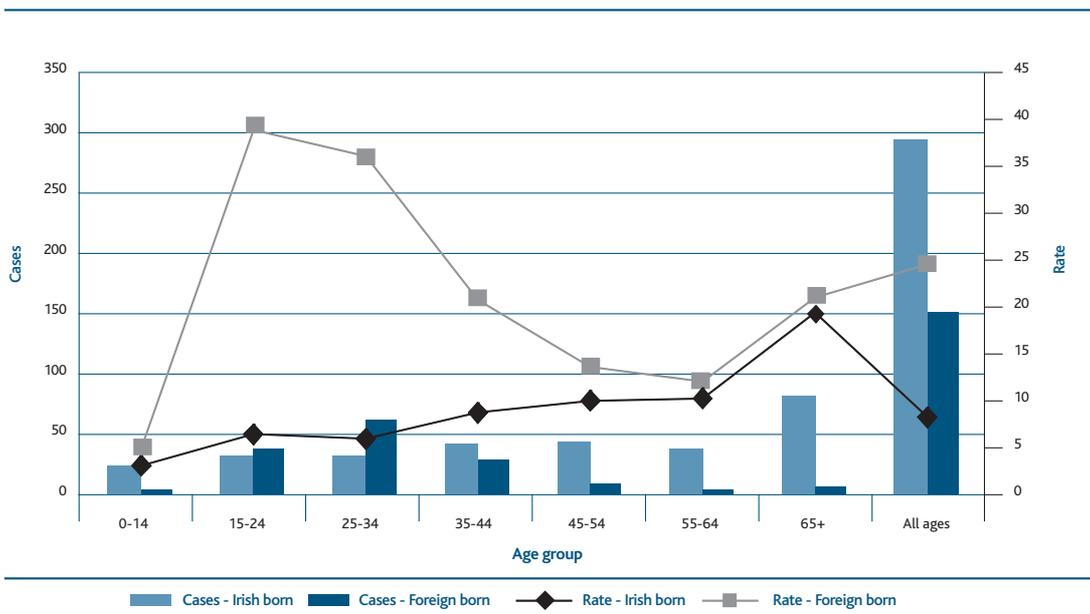


Figure 9: TB cases by age group (years) and age-specific rates by geographic origin, 2005

Site of disease

Of the 450 cases notified in 2005, 278 (61.9%) were pulmonary, 130 (29.0%) were extrapulmonary and 41 (9.1%) were pulmonary and extrapulmonary. For one case (0.2%), the site was unspecified. TB cases by site of disease and HSE area are shown in table 13.

Table 13: TB cases by site of disease and HSE area, 2005*

HSE area	Pulmonary		Extrapulmonary		Pulmonary & extrapulmonary	
	Number	%	Number	%	Number	%
HSE E	109	56.2	58	29.9	27	13.9
HSE M	7	43.8	5	31.3	4	25.0
HSE MW	38	71.7	12	22.6	3	5.7
HSE NE	9	69.2	4	30.8	0	0
HSE NW	7	46.7	8	53.3	0	0
HSE SE	21	56.8	14	37.8	2	5.4
HSE S	49	64.5	22	28.9	5	6.6
HSE W	38	84.4	7	15.6	0	0
Ireland	278	61.9	130	29.0	41	9.1

* Site of disease was unspecified in one case.

Pulmonary TB cases

The WHO defines pulmonary TB, for the purpose of analysis, as any case that has a pulmonary disease component. There were 319 cases reported in 2005 with a pulmonary disease component (70.9% of all cases reported). Sputum smear and culture results for these cases are shown in table 14. Sputum microscopy results were available for 284 (89.0%) of the 319 cases. This is slight increase compared to the figures from 2004 (83.5%), 2003 (82.9%) and 2002 (82.6%). Of the 319 pulmonary cases, 145 (45.5%) were sputum positive for AFB by microscopy and 224 (70.2%) were culture positive.

The proportion of pulmonary cases (with or without an extrapulmonary site) was higher in persons born in Ireland (76.8%) compared to those born abroad (59.2%).

Pulmonary smear positive cases

In Ireland in 2005, 141 (44.2%) of the 319 cases with a pulmonary disease component were smear positive.

Table 14: Sputum smear and culture status for pulmonary TB cases, 2005

Culture result	Sputum smear positive	Sputum smear negative	Sputum smear not done	Sputum smear not known	Total
Culture pos	134	68	20	2	224
Culture neg	1	31	15	9	56
Culture not done	0	3	7	4	14
Culture unknown	6	11	5	3	25
Total	141	113	47	18	319

Extrapulmonary TB cases

Extrapulmonary TB was diagnosed in 130 (28.9%) cases of whom 59 (45.4%) were culture confirmed. Fifty-three (41.1%) of the 129 cases were histology positive, 24 of which were also culture positive and 29 of which were laboratory confirmed by histology only.

One hundred and seventy-one (38.0%) of the cases reported in 2005 had an extrapulmonary disease component. The extrapulmonary sites reported are shown in table 15. The most frequent sites of extrapulmonary disease reported were extrathoracic lymph nodes (29.2%) and pleura (20.5%).

Table 15: Extrapulmonary disease sites in notified cases, 2005

Site	Number	Percentage
Lymph (extra-thoracic)	50	29.2
Pleural	35	20.5
Other	24	14.0
Lymph (intra-thoracic)	12	7.0
Spinal	10	5.8
Bone	9	5.3
Genitourinary	9	5.3
Meningeal	9	5.3
Peritoneal	5	2.9
Disseminated	4	2.3
CNS	3	1.8
Site not specified	1	0.6
Total	171	100.0

TB meningitis

There were nine cases of TB meningitis reported in 2005 giving an incidence rate of 0.2/100,000 population (2/million population). A profile of these cases is provided in table 16. Of the nine cases, eight were diagnosed as extrapulmonary and one was diagnosed as pulmonary and extrapulmonary. One case of TB meningitis was culture confirmed.

Between 1998 and 2005, a total of 50 cases of TB meningitis have been reported, six in 1998, seven in 1999, six in 2000, two in 2001, six in 2002, eight in 2003, six in 2004 and nine in 2005. The cumulative incidence rates of TB meningitis in each HSE area and in Ireland for 1998-2005 are shown in table 17.

Table 16: TB meningitis cases in Ireland, 2005

HSE area	Age group (years)	History of BCG	Culture status
ERHA	0-14	Yes	Negative
ERHA	55-64	Unknown	Positive
MWHB	15-24	Yes	Negative
SEHB	65+	Unknown	Negative
SHB	0-14	No	Negative
SHB	15-24	No	Unknown
SHB	15-24	Unknown	Negative
SHB	25-34	Unknown	Unknown
SHB	25-34	Yes	Unknown
Total	9 cases		

Table 17: Cumulative incidence rate of TB meningitis in Ireland, 1998-2005

HSE area	Cases 1998 to 2005	Cumulative incidence rate per 100,000	95% CI
HSE E	18	1.28	0.7 - 1.9
HSE M	0	0.00	0 - 0
HSE MW	3	0.88	-0.1 - 1.9
HSE NE	6	1.74	0.3 - 3.1
HSE NW	2	0.90	-0.3 - 2.2
HSE SE	2	0.47	-0.2 - 1.1
HSE S	16	2.76	1.4 - 4.1
HSE W	3	0.79	-0.1 - 1.7
Ireland	50	1.28	0.9 - 1.6

Note: Calculations based on 2002 census figures

Bacteriological results

Of the 450 cases notified in 2005, 330 (73.3%) were laboratory confirmed (by culture, microscopy, or histology) and 120 cases were not laboratory confirmed.

Of the 319 cases with a pulmonary component, 242 (75.9%) were laboratory confirmed and of the 130 extrapulmonary cases, 88 (67.7%) were laboratory confirmed.

Culture

In countries where laboratories capable of identification of *M. tuberculosis* complex are routinely available, a definite case of TB has been defined as a case with culture confirmed disease due to *M. tuberculosis* complex. In 2005, 283 (62.9%) of all TB cases notified were culture positive. This is similar to the proportion reported in 2004 (64.6%) and 2003 (64.4%) and is an increase on the percentage reported in 2002 (61.0%) and 2001 (58.8%).

Of the 319 cases with a pulmonary component, 224 (70.2%) were culture confirmed and of the 130 extrapulmonary cases, 59 (45.4%) were culture confirmed.

Table 18 shows the breakdown of laboratory-confirmed and culture-confirmed cases by site of disease.

Table 19 shows a breakdown by culture status and HSE area of TB cases notified in 2005.

Table 18: Laboratory-confirmed and culture-confirmed cases of TB by site of disease, 2005

Site of disease	Total	Culture-confirmed	% Culture-confirmed	Laboratory-confirmed	% Laboratory-confirmed
Pulmonary	278	195	70.1	210	75.5
Pulmonary and extrapulmonary	41	29	70.7	32	78.0
Extrapulmonary	130	59	45.4	88	67.7
Unknown	1	0	0.0	0	0.0
Total	450	283	62.9	330	73.3

Table 19: Culture status of TB cases by HSE area, 2005

HSE area	Culture positive	Culture negative	Culture not done	Culture unknown	Total
HSE E	129	34	12	20	195
HSE M	8	3	3	2	16
HSE MW	38	12	0	3	53
HSE NE	6	1	0	6	13
HSE NW	11	1	3	0	15
HSE SE	22	13	1	1	37
HSE S	45	12	4	15	76
HSE W	24	14	6	1	45
Ireland	283	90	29	48	450

Species

Among the 283 culture-confirmed cases, information on species was reported for 280 (98.9%) of the cases. Of the 280 culture-confirmed cases where species was reported, 275 (98.2%) were *M. tuberculosis*, four (1.4%) were *M. bovis* and one (0.4%) was *M. africanum*.

Antibiotic resistance

Information on the results of sensitivity testing was reported for 275 (97.2%) of the 283 culture-confirmed cases. Of the 275 *M. tuberculosis* isolates, resistance was documented in 13 cases (2.9% of total cases), including two cases of multi-drug resistant TB (MDR-TB) (representing 0.4% of total cases). One of the MDR-TB cases was resistant to isoniazid and rifampicin and the other was resistant to isoniazid, rifampicin, pyrazinamide, streptomycin and ethambutol. One case of extensively-drug resistant TB (XDR-TB) was notified during 2005. This is the first XDR-TB case notified in Ireland. Mono-resistance to isoniazid was recorded in nine cases. One further case was resistant to both isoniazid and streptomycin. Nine of the 13 (69.2%) drug resistant cases, including one of the MDR-TB cases, were born outside Ireland. A profile of resistant cases in 2005 is shown in table 20.

Table 20: Sensitivity results of drug resistant TB cases in Ireland, 2005

Diagnosis	Isolate	Isoniazid	Rifampicin	Pyrazinamide	Ethambutol	Streptomycin
Pulmonary	M.TB	+	+	+	+	+
Pulmonary	M.TB	+	+	+	+	+
Pulmonary	M.TB	+	+	-	-	-
Extrapulmonary	M.TB	+	-	-	-	+
Extrapulmonary	M.TB	+	-	-	-	-
Extrapulmonary	M.TB	+	-	-	-	-
Extrapulmonary	M.TB	+	-	-	-	-
Extrapulmonary	M.TB	+	-	-	-	-
Pulmonary	M.TB	+	-	-	-	-
Pulmonary	M.TB	+	-	-	-	-
Pulmonary	M.TB	+	-	-	-	-
Pulmonary	M.TB	+	-	-	-	-
Pulmonary	M.TB	+	-	-	-	-

(+ indicates resistance)

Treatment outcome

Outcome was recorded for 392 (87.1%) of the 450 cases notified in 2005. Of the 392 cases, 304 completed treatment, 32 were recorded as being lost to follow up, 37 died, treatment was interrupted in eight cases, 10 cases were still on treatment at time of reporting and one case defaulted on treatment. Of the 37 deaths reported, 10 (2.2% of total cases) were attributed to TB.

Outcome was reported for 129 of the 141 smear positive cases. Of the 129, 98 completed treatment, 12 were lost to follow up, treatment was interrupted in one case, 12 died and six were still on treatment at time of reporting. Of the 12 deaths among smear positive cases, two were attributed to TB.

Of the 13 drug resistant cases, six completed treatment while four cases were still on treatment, one died and treatment outcome was unknown in two cases. Of the two MDR-TB cases, one case was still on treatment and outcome was unknown for the remaining case.

Details on treatment outcome for all cases and for smear positive cases only are shown in table 21.

Table 21: Treatment outcome for all cases and smear positive cases, 2005

Treatment outcome	Total cases		Smear positive cases	
	Number	%	Number	%
Completed	304	67.6	98	69.5
Lost to follow up	32	7.1	12	8.5
Died (attributed to TB)	10	2.2	2	1.4
Died (not attributed to TB)	27	6.0	10	7.1
Still on treatment	10	2.2	6	4.3
Interrupted (>2mths)	8	1.8	1	0.7
Defaulted	1	0.2	0	0.0
Unknown	58	12.9	12	8.5
Total	450	100	141	100

Case ascertainment

Table 22 summarises the method by which cases notified in 2005 were found.

Table 22: Method of case finding, 2005

Case found by	Total	Percentage
Presenting as case	381	84.7
Contact tracing	25	5.6
Other	18	4.0
Other screening	8	1.8
Immigrant screening	1	0.2
Unknown	17	3.8
Total	450	100.0

Previous history of TB

Forty-four (9.7%) of the 450 cases were reported to have a previous history of TB with previous year of diagnosis provided for 31 cases. The year of diagnosis ranged from 1936 to 2004 with 11 of the 31 cases (35.5%) reported to have had TB in the previous ten years.

HIV Status

Of the 450 cases, 11 were reported as being HIV positive. However, information on HIV status was not provided or was unknown for 422 (93.8%) of the cases notified in 2005.

Discussion

This is the eighth national report produced by HPSC on the epidemiology of TB in Ireland. The report is based on data from the enhanced national TB surveillance system (NTBSS 2000) which became operational in all HSE areas in Ireland in January 2000. The new system is based on the minimum dataset required by EuroTB (www.eurotb.org).

In 2005, 450 cases of TB were notified to HPSC giving a national crude incidence rate of 10.6/100,000 population. This is slightly higher than the rates reported between 2000 and 2004, which ranged from 9.7/100,000 to 10.4/100,000 population, but is lower than the crude incidence rates reported between 1991 and 1999, which ranged from 11.5/100,000 to 18.5/100,000. The overall notification rate in countries of the EU which reported to EuroTB was 18.7/100,000 in 2005, ranging from 4.4/100,000 in Cyprus to 75.0/100,000 in Lithuania.²

Differences in age-standardised TB incidence rates persist between HSE areas with HSE MW having the highest rate in 2005 followed by HSE E and HSE S. HSE NE had the lowest rate in 2005, followed by the HSE NW and HSE M. Examining HSE E in greater detail reveals that certain community care areas (CCAs), in particular CCAs 3, 5, 6 and 7, have consistently high rates of TB. According to the 2002 Census, between 25 to 33% of the population in these CCAs belong to social class 6 and 7 (see Appendix 2 for descriptions of social class)⁵. Rates greater than 20/100,000 were reported from CCAs 3 and 7 (HSE E) and North Lee (HSE S) in 2005. Meath had very low rates in 2005 at 1.84 per 100,000.

The highest age-specific rate in 2005 occurred among those aged 65 years and over (19.0/100,000 population). This was similar to the rate observed in this age group between 2001 and 2004. There were 28 cases in children under 15 years of age in 2005 giving a rate of 3.0/100,000. This is an increase from the rate in 2004 (1.2), but remains comparable to the rate in 2003 (2.9). Between 2000 and 2004, the age-specific rate among the 25-34 year age group increased from 10.5 to 16.9 per 100,000 population, this has decreased to 13.0 per 100,000 population in 2005. There was a notable difference in age between those born in Ireland and those born outside Ireland. In cases born in Ireland, there was a peak among those aged greater than 64 years with a median age of 50 years. In cases born outside Ireland, the peak occurred in those aged 25-34 years old with a median age of 29 years. There were 62 foreign-born cases out of a total of 94 (66.0%) in the 25-34 year age group in 2005 compared to 73 foreign-born cases out of a total of 122 (59.8%) in this age group in 2004. Where available, data from other countries in the EU and Western Europe show similar trends with the highest rates in the indigenous population aged greater than 64 years and the highest rates in foreign-born cases in the 25-34 year age group.²

Rates among males were higher than females for all age groups. The highest rates among males (21.2/100,000) and females (17.3/100,000) were among those aged 65 years and over. The male to female ratio (1.5:1) reported in 2005 was consistent with the rate reported in 2004 (1.5:1).

During 2005, 33.8% of TB cases notified were born outside Ireland. This compares to 30% in 2004, 21.9% in 2003, 30.1% in 2002 and 16.5% in 2001. In 2005, among countries in the EU and Western Europe who reported data to the EuroTB network, 20% of notifications were in foreign-born patients. In the United Kingdom, France, Germany and Belgium, where crude incidence rates are similar to those reported in Ireland, the percentage of cases of foreign origin in 2005 ranged from 43 to 64%.² The crude rate of TB notifications in the indigenous population was 8.3/100,000 population which was very similar to the rate of 8.4/100,000 population in 2004.

There were nine cases of TB meningitis in 2005, giving a rate of 0.2/100,000 population. Of the nine cases of TB meningitis, two were aged between 0-14 years, three were aged 15-24 years, two were aged 25-34 years, one was aged 55-64 years and one was aged greater than 65 years. Between 1998 and 2005, four cases of TB meningitis were reported among 0-4 year olds. The Report of the Working Party on

Tuberculosis (1996)³, recommends that the cessation of neonatal BCG vaccination should be considered if certain criteria are met. The criteria for discontinuation of BCG vaccination and how they apply to Ireland are outlined in Appendix 3.

In 2005, 283 of all cases of TB notified (62.9%) were culture positive. This is similar to the proportion in 2004 and 2003 (64.6%) and is an increase on the proportion in previous years (61.0% in 2002 and 58.8% in 2001). One hundred and forty-one pulmonary cases were smear positive.

There were 13 drug resistant cases notified in 2005, including two cases of MDR-TB. One case of extensively-drug resistant TB (XDR-TB) was notified during 2005. This is the first XDR-TB case notified in Ireland. MDR cases and cases resistant to isoniazid represented 0.4% (2 cases) and 2.8% (13 cases) of total cases respectively. This compares to 0.5% and 3.5% respectively in 2004. In 2005, combined multi-drug resistance and mean combined isoniazid resistance were 18.3% and 30.5% respectively in the Baltic States and 2% and 9% respectively in the 18 other countries in the EU and Western Europe.

Drug resistance is an issue that needs to be kept under close surveillance especially with the emergence of XDR-TB. In September 2006, WHO expressed concern over the emergence of XDR-TB and called on countries to strengthen and implement measures to prevent the global spread of these virulent drug resistant strains of TB. In this context, WHO recommends strengthening of basic TB care and public health infrastructures to prevent the emergence of drug-resistance, increased collaboration between HIV and TB control programmes and increased investment in laboratory infrastructure to enable better detection and management of resistant cases of TB.⁴

In recent years, the quality of the data, and in particular, data on treatment outcome, has improved greatly. In 2005, information on treatment outcome was provided for 87.1% of cases which is an increase on the proportion in 2004 (84.3%). This compares to 84.8% in 2004, 77.2% in 2002 and 59.8% in 2001. It is of critical importance to TB control in Ireland that surveillance of TB and reporting of outcome data be maintained at a high level.

The Global Plan to Stop TB 2006-2015 was launched in January 2006 and aims to reduce the global prevalence of, and deaths due to TB by 50% in 2015 relative to 1990. In addition it proposes to eliminate TB as a public health problem (<1 case per million population) by 2050. This strategy calls on countries to strengthen health systems for TB treatment and control and to address MDR-TB, TB/HIV and other challenges e.g. high risk groups and areas where TB rates are high.⁷ The importance of good surveillance data cannot be underestimated in this context as they will help guide where resources should be directed in order to ensure effective control of TB in Ireland and in order to reach the elimination target by 2050.

Conclusions

There was a slight increase in TB case notifications in 2005 compared to 2004, 2003 and 2002.

A regional variation was noted in the TB notification rates ranging from 3.3/100,000 in HSE North East to 14.7 per 100,000 in HSE Mid-West.

Certain community care areas in HSE East (CCA 3 and 7) and North Lee in HSE South reported rates greater than 20/100,000 population in 2005.

The highest age-specific rate in 2005 occurred among those aged greater than 64 years.

The age-specific rate among 25-34 years olds decreased to 13.0/100,000 in 2005 from 16.9/100,000 in 2004.

Rates were higher in males than females for all age groups. The highest rates among males and females were in those aged greater than 64 years.

In 2005, 33.8% of cases were born outside Ireland compared to 30.0% in 2004, 21.9% in 2003 and 30.1% in 2002.

There was a notable difference in age between cases born in Ireland (median age 50 years) and cases born outside Ireland (median age 29 years).

In 2005, 320 of the TB cases had a pulmonary disease component of which 224 were culture positive and 141 were smear positive.

There were nine cases of TB meningitis in 2005. Ages ranged between eight to 79 years.

Treatment outcome data were provided for 87.1% of cases, a similar proportion to 2004. Treatment was completed for 304 of the cases notified in 2005 and there were 37 deaths reported (10 attributable to TB).

There were 13 drug resistant cases notified in 2005. Of the 13, all were resistant to isoniazid, including two MDR-TB cases. One case of XDR-TB was notified during 2005. This is the first XDR-TB case notified in Ireland.

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Appendix 1: TB Cases Notified in Ireland in 2006, Provisional Data^ψ

There were 458 cases of TB provisionally notified in 2006. It is important to note that these data are provisional and **may change significantly following validation**.

A summary of the data is shown in table 23.

Table 23: Provisional summary of the epidemiology of TB in Ireland, 2006

Parameter	2006
Total number of cases	458
Crude notification rate per 100,000	10.8
Cases in indigenous population	288
Cases in foreign-born persons	151
Culture positive cases	218
Smear positive pulmonary cases	131
Mono-resistance to isoniazid	4
Multi-drug resistant cases	3
TB meningitis cases	6

Crude incidence rates by HSE area

The total number of TB cases in each HSE area is shown in table 24 with crude incidence rates and 95% confidence intervals included.

Table 24: Provisional TB cases in each HSE area, 2006

HSE area	Cases	Crude rate per 100,000	95% CI for rate
HSE E	179	11.9	10.2 - 13.7
HSE M	16	6.4	3.2 - 9.5
HSE MW	38	10.5	7.2 - 13.9
HSE NE	32	8.1	5.3 - 10.9
HSE NW	9	3.8	1.3 - 6.3
HSE SE	51	11.1	8 - 14.1
HSE S	101	16.3	13.1 - 19.4
HSE W	32	7.7	5 - 10.4
Ireland	458	10.8	9.8 - 11.8

Age and sex

There were 273 cases (59.6%) of TB notified in males and 183 cases (40.0%) in females, giving a male to female ratio of 1.5:1. Sex was not reported in two cases.

The mean age of cases notified was 42.7 years (range 0 to 93 years). Age was not reported for one case.

Geographic origin

Of the 458 cases provisionally notified in 2006, 288 (62.9%) were born in Ireland, 151 (33.0%) were foreign-born. Information on country of birth was not reported for 19 cases.

^ψ 2006 data as of 11th September 2007

Of the 151 cases born outside Ireland, 52 were born in Africa, 47 in Asia, 35 in Europe, three in America and two in Oceania. The country of birth was unknown for 12 of the cases born outside Ireland.

Site of disease

Of the 458 cases provisionally notified in 2006, pulmonary TB was diagnosed in 296 cases (64.6%), extrapulmonary TB in 119 cases (26.0%) and pulmonary and extrapulmonary TB in 35 cases (7.6%). The site of disease was unknown for 8 cases (1.7%).

Of the 331 cases with a pulmonary disease component, 163 (49.2%) were culture positive and 131 (39.6%) were smear positive.

TB meningitis

There were six cases of TB meningitis provisionally notified in 2006 giving an incidence rate of 0.1/100,000 population (1/million population). Three of the cases were aged less than 15 years, two were aged 15-24 years and one was aged greater than 64 years. None of the cases were reported as having received BCG vaccination. Of these six cases, one was culture positive and the culture status was not reported for the remaining five.

Culture

Of the 458 cases provisionally notified in 2006, 218 (47.6%) were culture confirmed. Of the 331 with a pulmonary component, 163 (49.2%) were culture positive and of the 119 extrapulmonary cases, 55 (46.2%) were culture positive.

Among the 218 culture positive cases, 197 were *M. tuberculosis*, three were *M. bovis* and 2 were *M. africanum*. The species was not provided for 16 of the culture positive cases.

Antibiotic resistance

Resistance was reported in 12 cases out of a total of 201 *M. tuberculosis* isolates (5.5%). There were three cases of MDR-TB and four which were mono-resistant to isoniazid. Four of the 12 resistant cases, including two of the MDR-TB cases, were born outside Ireland.

Appendix 2: Social Class (Source: CSO)⁵

Social Class

The entire population is also classified into one of the following social class groups (introduced in 1996) which are defined on the basis of occupation:

- 1 Professional workers
- 2 Managerial and technical
- 3 Non-manual
- 4 Skilled manual
- 5 Semi-skilled
- 6 Unskilled
- 7 All others gainfully occupied and unknown

The occupations included in each of these groups have been selected in such a way as to bring together, as far as possible, people with similar levels of occupational skill. In determining social class no account is taken of the differences between individuals on the basis of other characteristics such as education. Accordingly social class ranks occupations by the level of skill required on a social class scale ranging from 1 (highest) to 7 (lowest). This scale combines occupations into six groups by occupation and employment status following procedures similar to those outlined above for the allocation of socio-economic group. A residual category "All others gainfully occupied and unknown" is used where no precise allocation is possible.

Appendix 3: BCG Vaccination

The Report of the Working Party on Tuberculosis (1996),³ based on the recommendations of the International Union Against Tuberculosis and Lung Disease (IUATLD),⁶ recommends that the cessation of neonatal BCG vaccination should be considered if certain criteria are met.

Criterion 1

There is a well functioning tuberculosis control programme.

Ireland: The tuberculosis control programme is currently being reviewed and it is likely that recommendations will be made for strengthening the programme.

Criterion 2

There has been a reliable reporting system over the previous five or more years, enabling the estimation of the annual incidence of active tuberculosis by age and risk groups, with particular emphasis on tuberculosis meningitis and sputum smear positive pulmonary tuberculosis.

Ireland: Yes. National data enabling a detailed epidemiological analysis for the country as a whole were first presented by HPSC in the 1998 National TB Report. The 2005 report is the eighth national TB report produced by HPSC.

Criterion 3

Due consideration has been given to the possibility of an increase in the incidence of tuberculosis resulting from the epidemiological situation of AIDS in that country.

Ireland: Yes

Criterion 4

The average annual notification rate of sputum smear positive pulmonary tuberculosis should be 5/100,000 or less during the previous three years.

Ireland: Yes. In 2005, the national rate for sputum smear positive pulmonary TB was 3.3/100,000 while in 2004, 2003 and 2002, the rates were 3.5/100,000, 3.7/100,000 and 3.1/100,000 respectively.

Criterion 5

The average annual notification rate of TB meningitis in children under five years of age should be less than one case per ten million general population over the previous five years.

Ireland: No. Between 2000 and 2005, there were three cases of TB meningitis in children under five years of age, two in 2003 and one in 2002. Of the three cases, one child had received BCG vaccination and the other two had not. Two of the three cases were culture confirmed.

Criterion 6

The average annual risk of tuberculosis infection should be 0.1% or less.

Ireland: Not applicable.

When considering the importance of neonatal BCG vaccination, it is worth considering the practice in other European countries. For example, Sweden discontinued routine neonatal BCG vaccination in 1975 when they had a total notification rate of 20/100,000 population and an age-specific incidence rate for children aged 0-14 years of 0.3/100,000. While the national crude rate in Ireland is less than 20.0/100,000 population, the 2005 age-specific incidence rate for children 0-14 years was 3.0/100,000, 10 times the rate recorded in Sweden when they discontinued neonatal BCG vaccination. In 2004, 2003, 2002, 2001 and 2000, the age-specific incidence rate for children aged 0-14 years was 1.2/100,000, 2.9/100,000, 2.2/100,000, 1.9/100,000, and 1.9/100,000 respectively. In 1999, the age-specific incidence rate for children aged 0-14 years was 4.7/100,000 population, almost sixteen times the rate recorded in Sweden.

In summary, Ireland does not yet meet all of the criteria (outlined above), for discontinuation of the national BCG vaccination programme.

Index of Tables and Figures

Table 1:	Summary of the epidemiology of TB in Ireland, 2005	7
Table 2:	Notified cases of TB in Ireland 1991-2005 with crude rates per 100,000 population and 3-year moving averages 1992-2004	7
Table 3:	Notified TB cases by HSE area, 2005	8
Table 4:	Crude TB incidence rates per 100,000 population by HSE area, 1992-2005	8
Table 5:	3-year moving average TB notification rate per 100,000 population, 1992-2004	8
Table 6:	TB cases by HSE area and sex, 2005	9
Table 7:	Age-specific TB rates per 100,000 population for males and females, 2005	9
Table 8:	Age-standardised TB incidence rates per 100,000 population by county with 95% confidence intervals, 2005	11
Table 9:	Crude incidence rate per 100,000 by community care area (CCA), 2000 to 2005	13
Table 10:	3-year moving average TB notification rate per 100,000 population by CCA	14
Table 11:	Cases of TB by HSE area and geographic origin, 2005	15
Table 12:	Countries of origin of foreign-born persons with TB, 2005	16
Table 13:	TB cases by site of disease and HSE area, 2005	17
Table 14:	Sputum smear and culture status for pulmonary TB cases, 2005	17
Table 15:	Extrapulmonary disease sites in notified cases, 2005	18
Table 16:	TB meningitis cases in Ireland, 2005	18
Table 17:	Cumulative incidence rate of TB meningitis in Ireland, 1998-2005	18
Table 18:	Laboratory-confirmed and culture-confirmed cases of TB by site of disease, 2005	19
Table 19:	Culture status of TB cases by HSE area, 2005	19
Table 20:	Sensitivity results of drug resistant TB cases in Ireland, 2005	20
Table 21:	Treatment outcome for all cases and smear positive cases, 2005	21
Table 22:	Method of case finding, 2005	21
Table 23:	Provisional summary of the epidemiology of TB in Ireland, 2006	26
Table 24:	Provisional TB cases in each HSE area, 2006	26
Figure 1:	Tuberculosis notification rates per 100,000 population, WHO European region, 2005	4
Figure 2:	Cases of TB by age and sex and age-specific rates per 100,000 population, 2005	9
Figure 3:	Age-specific rates of TB by year, 2000 to 2005	10
Figure 4:	Age-standardised TB incidence rates per 100,000 population by HSE area with 95% confidence intervals, 2005	11
Figure 5:	Age-standardised TB incidence rates per 100,000 population by HSE area, 2005	11
Figure 6:	Age-standardised TB incidence rates per 100,000 population by county, 2005	12
Figure 7:	TB cases by geographic origin, 1998 to 2005	15
Figure 8:	TB cases by age group and geographic origin, 2005	16
Figure 9:	TB cases by age group (years) and age specific rates by geographic origin, 2005	16



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