



National Disease Surveillance Centre

A Report on the Epidemiology of
Tuberculosis in Ireland 2001

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Table of Contents

	Page No.
Acknowledgements	3
Introduction	4
Case Definitions	5
Materials and Methods	6
Data analysis	6
Results	6
<i>Notified TB cases in Ireland</i>	6
<i>Health board crude incidence rates</i>	7
<i>Age and sex breakdown of TB cases notified in 2001</i>	9
<i>Age-standardised TB incidence rates</i>	9
<i>Geographic origin of TB cases</i>	12
<i>Diagnostic classification</i>	12
<i>Outcomes</i>	16
Discussion	16
BCG Vaccination	17
Conclusions	18
References	19
Appendices	20

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Introduction

Since 1998, all available information on notified cases of TB in Ireland have been submitted to the National Disease Surveillance Centre (NDSC) for analysis. From January 1st, 2000, this information has included enhanced surveillance data items based on the minimum data set reported to EuroTB¹, the agency responsible for collating national TB data for countries within Europe and for reporting data to the WHO global TB control programme. The resulting National Tuberculosis Surveillance System (NTBSS) was set up following consultation with the eight health boards and the National Tuberculosis Advisory Group.

This report presents a review of the epidemiology of the cases of tuberculosis notified to NDSC by each of the health boards in Ireland during 2001. National epidemiological data on TB has been collated by NDSC since 1998.

While global TB control is improving, with more cases than ever being managed using the WHO's Directly Observed Treatment, Short-course (DOTS) strategy, the number of cases of TB worldwide has continued to increase significantly each year. The global incidence rate of TB is growing at approximately 0.4% per year, but at a much faster rate in sub-Saharan Africa and in countries of the former Soviet Union.

The number of countries implementing the DOTS strategy increased by 21 in 2000, and by 7 in 2001, bringing the total to 155.² By the end of 2001, 61% of the world's population lived in parts of countries providing DOTS and over 10 million patients have been diagnosed and treated using DOTS programmes since 1995.

In 2001, 381 cases of TB were reported to NDSC, which represented the lowest recorded annual incidence rate in Ireland (9.7 /100,000) since the introduction of the enhanced surveillance system.

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. 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 a laboratory confirmed case - either 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.**
- **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 2001 notification.**
- **Multi drug resistance (MDR) was defined as resistance to at least isoniazid and rifampicin with or without resistance to ethambutol and streptomycin.**

Materials and Methods

Individual case notification forms were completed by Area Medical Officers using the clinical, microbiological and histological data available to them. These forms were then collated in the Departments of Public Health. An Epi-Info file or copies of the TB notification forms were sent to NDSC on a quarterly basis. In NDSC, this anonymised information was merged into an Epi-Info TB database for analysis and quarterly reports were produced. The data in these quarterly reports are regarded as provisional until a process of validation has been completed during the 12 months following the end of the notification year. This includes updates on outcome and any other outstanding information.

Seven health boards used an Epi-Info TB database to record case notification data, in addition to the paper records. The remaining health board supplied the provisional data for quarterly reports by fax and supplied data on electronic format for the updated information.

Data analysis

Data were analysed using Epi-Info software version 6.04d.⁴ The X^2 (Chi-square) test was used to compare proportions in independent groups and 95% confidence intervals were used to compare rates between independent groups. Population data were taken from the 2002 census of population for calculations involving data from 2000 and 2001 and population data were taken from the 1996 census of population for calculations involving data from 1999 and 1998.

Indigenous Population was defined as those persons who were born in Ireland. Population data for the indigenous population only were taken from Table 29A, Volume 4 of the 2002 census, 'Persons usually resident in each province and county, and present in the state on census night, classified by country of birth'. Direct methods of standardisation were used to allow comparison of rates between geographical areas using the 2002 Irish population as the standard population.

Results

Notified TB cases in Ireland

There were 381 cases of TB notified in the period January 1st - December 31st, 2001. A summary of the data is shown in table 1.

Table 1: Summary of the epidemiology of TB in Ireland, 2001

PARAMETER	NUMBER
Total number of cases	381
Crude notification rate per 100,000	9.7
Cases in indigenous population	307
Cases in non-nationals	63
Culture positive cases	224
Smear positive pulmonary cases	128
Cases resistant to isoniazid	9
Cases resistant to rifampicin	2
Cases resistant to ethambutol	2
Cases resistant to pyrazinamide	4
Cases resistant to streptomycin	7
Multi-drug resistant cases	2
Deaths attributable to TB	5
Outcomes reported in cases	230
TB meningitis cases	2

Table 2 shows the number of TB cases notified in each quarter of 2001. Four cases could not be allocated to a specific quarter of the year. Notifications were lowest in the fourth quarter (as in 1999 and 2000) and highest in the first quarter.

Table 2: Number of TB notifications in each quarter in 2001

QUARTER (2001)	NO. OF CASES NOTIFIED	PERCENTAGE (%)
January-March	118	31.0
April-June	94	24.7
July-September	91	23.9
October-December	74	19.4
Unassigned [†]	4	1.0
Total	381	100

[†]4 cases could not be allocated to a specific quarter

The number of cases notified for each of the years from 1991-2001 is shown in table 3. Crude rates were calculated using 1991 census data for 1991-1993. Census data from 1996 were used in the calculation of crude rates for years 1994-1999 and 2002 census data were used to calculate crude rates for 2000-2001.

Table 3: Notified cases of TB in Ireland 1991-2001 with crude rates per 100,000 population and 3-year moving averages 1992-2000*

Year	Number	Crude Rate per 100,000	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	

* Three-year moving averages were calculated by applying the formula $(a+2b+c)/4$ to each of three successive points a, b and c (each letter representing a year) in the series and the result was used as the smoothed value of b.

Health board crude incidence rates

The total number of TB cases in each health board is shown in table 4a, with the totals for the indigenous population in each health board being shown in table 4b.

The highest crude rate was reported in the Southern Health Board (12.4/100,000 population) with the ERHA reporting a crude rate of 12.3/100,000 population. The Midland Health Board reported the lowest crude rate at 3.1/100,000. The crude rates in the MHB and the SEHB (4.7/100,000 population) were significantly lower than the national crude incidence rate (9.7/100,000 population).

The crude TB incidence rates for the indigenous population alone were highest in the SHB (12.4/100,000 population) and were lowest in the MHB (2.9/100,000 population).

The crude incidence rates seen in each health board in the period 1992-2001 are shown in table 5 while the 3-year moving average TB notification rates for each health board for the period 1992-2000 are shown in table 6.

Table 4a: TB cases in each health board in 2001

Health Board	Cases	Crude Rate/100,000	95% CI for rate
ERHA	173	12.3	10.4-14.1
MHB	7	3.1	0.8-5.4
MWHB	24	7.1	4.2-9.9
NEHB	38	11.0	7.5-14.5
NWHB	13	5.9	2.7-9.1
SEHB	20	4.7	2.7-6.8
SHB	72	12.4	9.5-15.3
WHB	34	8.9	5.9-11.9
Ireland	381	9.7	8.7-10.7

Table 4b: TB cases in each health board in 2001 for the indigenous population only

Health Board	Cases	Crude Rate/100,000	95% CI for rate
ERHA	134	10.9	9.1-12.8
MHB	6	2.9	0.6-5.3
MWHB	22	7.3	4.2-10.3
NEHB	31	10.1	6.6-13.7
NWHB	11	5.8	2.4-9.3
SEHB	15	3.9	1.9-5.9
SHB	64	12.4	9.3-15.4
WHB	24	7.3	4.4-10.2
Ireland	307	8.9	7.9-9.9

Table 5: Crude TB incidence rates per 100,000 by health board, 1992-2001

Health Board	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
ERHA	16.2	11.6	13.4	12.4	8.7	9.9	11.7	13.9	10.2	12.3
MHB	18.7	10.8	14.7	8.9	8.3	9.7	4.9	7.3	7.1	3.1
MWHB	20.9	18	17.7	15.4	17.7	15.1	14.8	17.0	13.8	7.1
NEHB	10	7.8	18.3	8.7	12.1	9.8	9.5	8.2	6.1	11.0
NWHB	15.9	26.3	9.1	11.5	7.1	10.4	9.0	9.0	4.1	5.9
SEHB	12.3	16.4	11.2	9.7	6.9	12.8	8.9	7.9	9.7	4.7
SHB	21.5	23.3	17.8	21	22.5	17.4	14.3	13.7	13.8	12.4
WHB	22.2	22.5	23.3	11.4	13.1	10.8	15.3	19.9	10.0	8.9
Ireland	17.1	17.0	14.5	12.6	12.0	11.5	11.7	12.9	10.1	9.7

Table 6: 3 year moving average TB notification rate per 100,000, 1992-2000

Health Board	1992	1993	1994	1995	1996	1997	1998	1999	2000
ERHA	14.7	13.2	12.7	11.7	9.9	10.1	11.8	12.4	11.7
MHB	16.1	13.8	12.3	10.2	8.8	8.2	6.7	6.7	6.2
MWHB	20.3	18.7	17.2	16.6	16.5	15.7	15.4	15.7	12.9
NEHB	10.1	11.0	13.3	12.0	10.7	10.3	9.3	8.0	7.9
NWHB	20.2	19.4	14.0	9.8	9.0	9.2	9.4	7.8	5.8
SEHB	12.6	14.1	12.1	9.4	9.1	10.4	9.6	8.6	8.0
SHB	21.7	21.5	20.0	20.6	20.9	17.9	14.9	13.9	13.4
WHB	26.0	22.6	20.1	14.8	12.1	12.5	15.3	16.3	12.2
Ireland	17.3	16.4	14.7	12.9	12.0	11.7	12.0	11.9	10.7

Age and sex breakdown of TB cases notified in 2001

There were 241 cases of TB notified in males (63.3%) in 2001 and 139 in females (36.5%), giving a male to female ratio of 1.7:1. The sex was not reported in one case. Table 7 gives the breakdown of notified TB cases by sex and by health board.

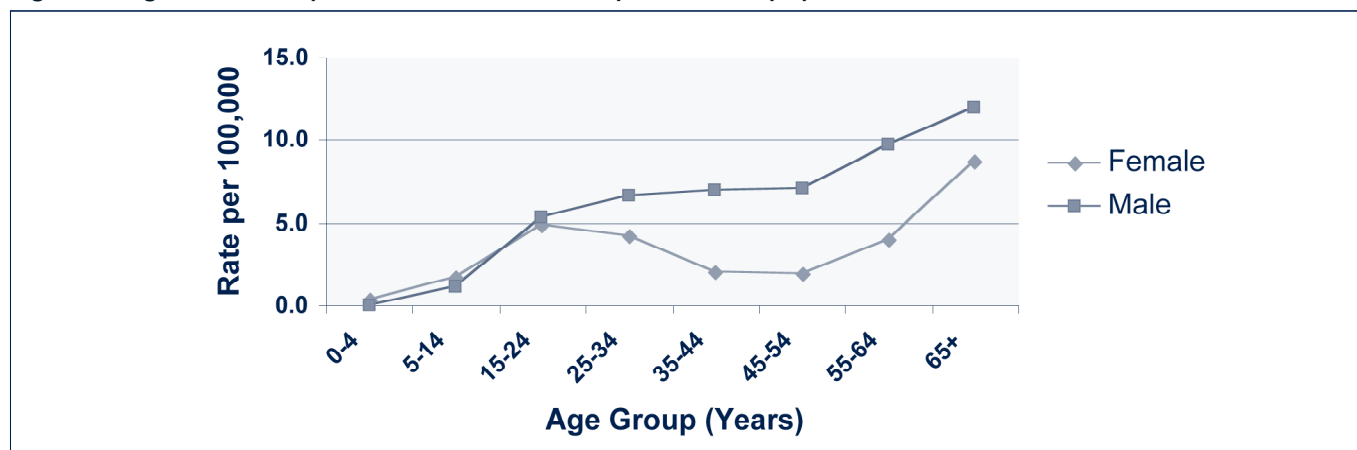
In 2001, the mean age was 45.5 years and 90 cases (23.6%) were aged 65 years or more. Figure 1 shows the national age- and sex-specific notification rates in Ireland for 2001.

Table 7: Sex breakdown of TB cases by health board in Ireland, 2001*

Health Board	Males	Females	Male:Female ratio
ERHA	111	62	1.8
MHB	4	3	1.3
MWHB	18	6	3.0
NEHB	25	13	1.9
NWHB	9	4	2.3
SEHB	13	7	1.9
SHB	42	30	1.4
WHB	19	14	1.4
Total	241	139	1.7

*Sex not reported in one case

Figure 1: Age- and sex-specific notification rates per 100,000 population, 2001†



†Age unknown in 1 case and sex unknown in 1 case

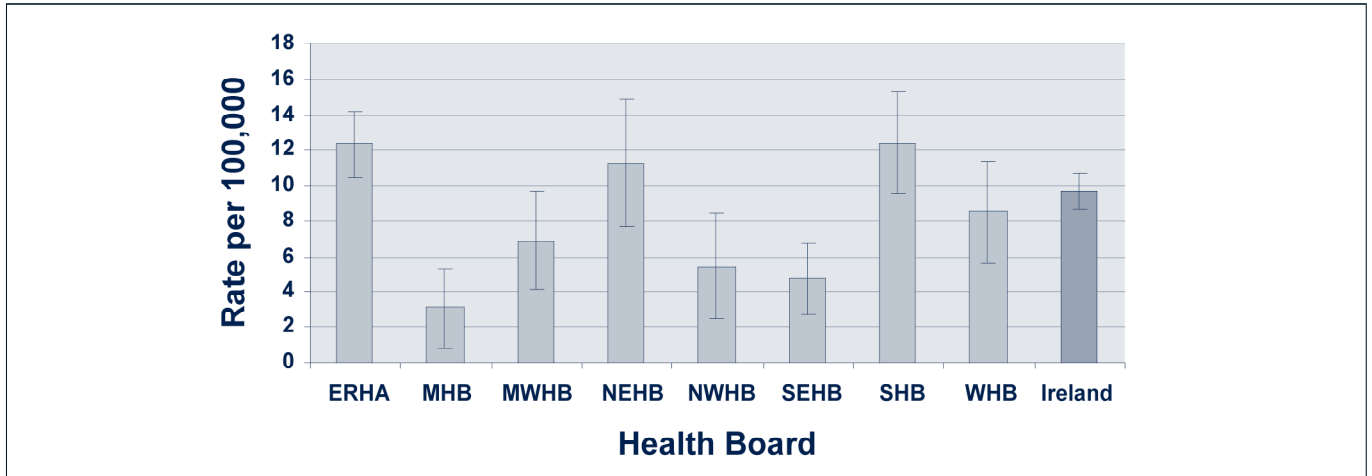
Age-standardised TB incidence rates

Age-standardised TB incidence rates are presented by health board and by county. Age standardised TB incidence rates for each health board are presented in Figures 2 and 3 (95% confidence intervals are included in Figure 3). The highest age standardised TB incidence rates were seen in the Eastern Regional Health Authority and the Southern Health Board at 12.4 per 100,000 population each. The Midland Health Board reported the lowest age standardised rate at 3.1/100,000 population. The age standardised rates in the MHB, SEHB (4.7/100,000 population) and NWHB (5.4/100,000 population) were significantly lower than the national age standardised incidence rate (9.7 per 100,000 population).

Age-standardised incidence rates for each county are shown in table 8 and Figure 4 (95% confidence intervals are included in Table 8).

Dublin had a significantly higher rate than the national figure. Counties with significantly lower incidence rates than the national rate were Kildare, Donegal, Mayo, Leitrim, Tipperary, Wexford, Laois and Offaly.

Figure 2: Age-standardised TB incidence



*Age not reported in one case

Figure 3: Age-standardised TB incidence rate per 100,000 population by health board in 2001

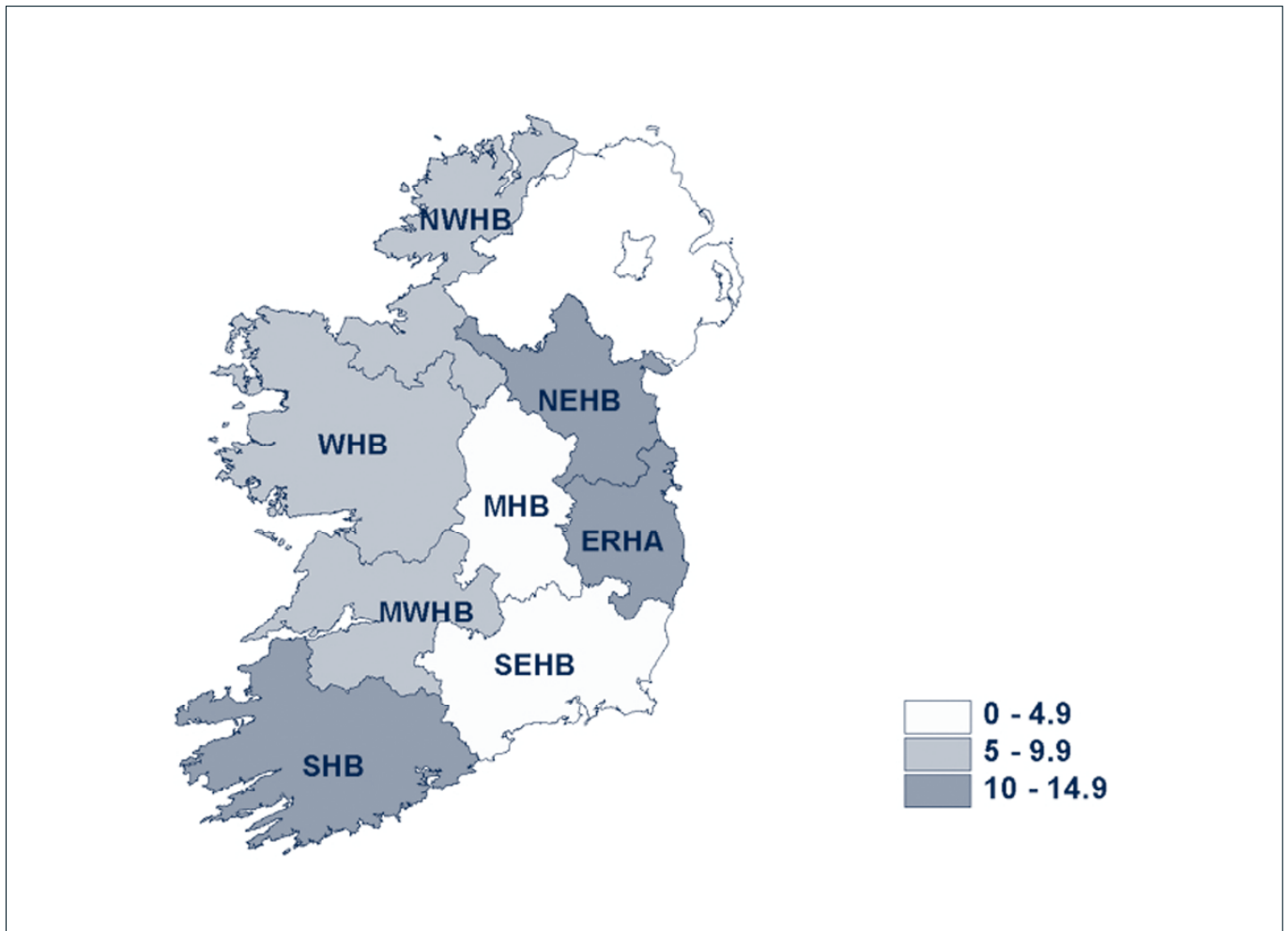
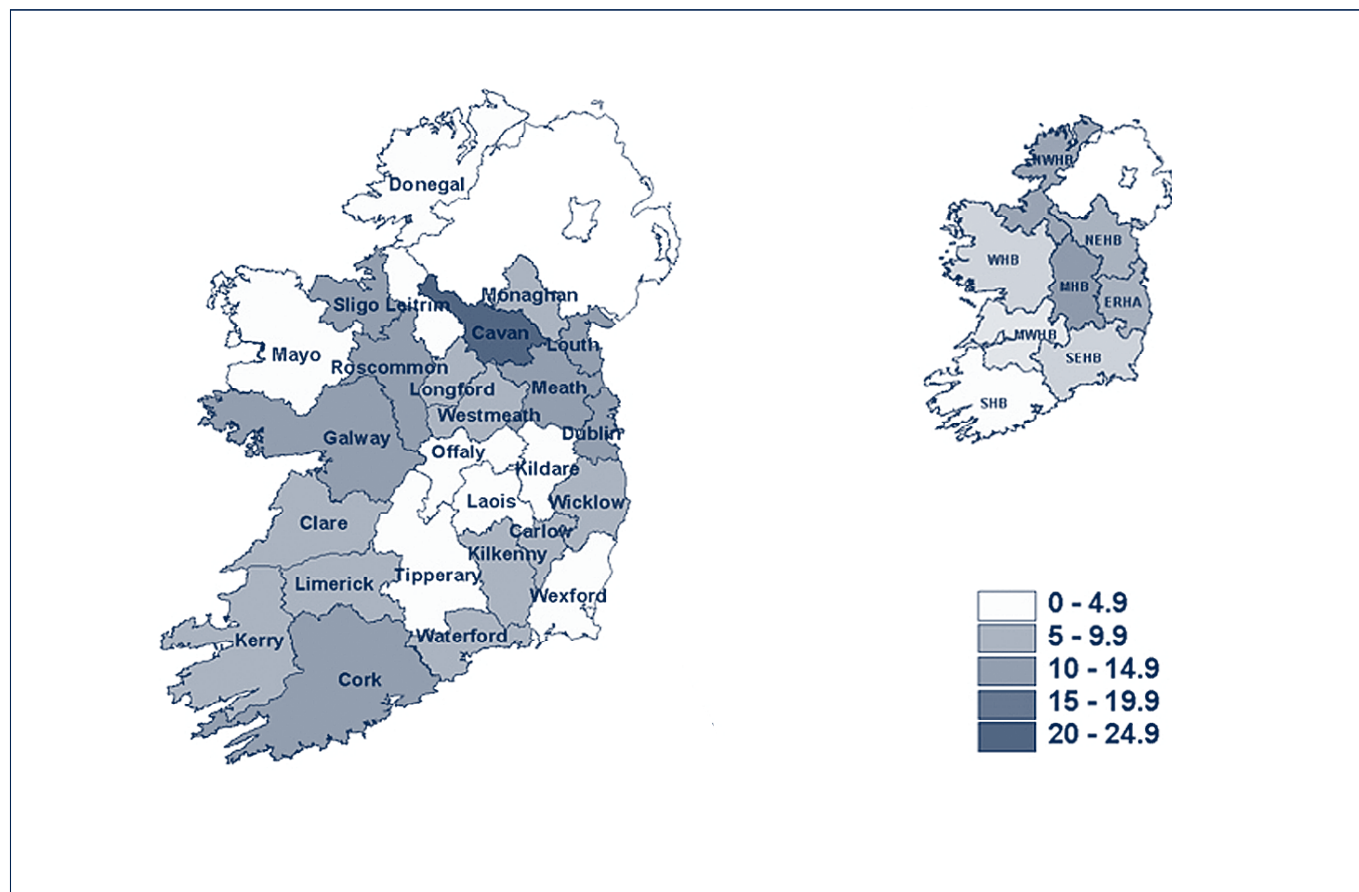


Table 8: Age standardised TB incidence rates per 100,000 population by county with 95% confidence intervals, 2001

County	Incidence rate/100,000	95% CI
Cavan	20.6	8.8-32.4
Cork	14.1	10.6-17.5
Dublin	13.6	11.5-15.8
Roscommon	13.2	3.7-22.6
Sligo	11.0	2.8-19.2
Louth	10.2	3.9-16.5
Meath	10.1	4.4-15.9
Galway	10.1	5.8-14.4
Limerick	9.7	5.1-14.3
Wicklow	9.3	3.5-15.0
Monaghan	8.2	0.1-16.2
Waterford	8.0	2.5-13.6
Kilkenny	7.2	1.4-13.0
Kerry	7.1	2.5-11.8
Westmeath	7.0	0.9-13.1
Carlow	6.8	0-14.5
Longford	6.6	0-16.0
Clare	5.8	1.1-10.4
Kildare	4.6	1.1-8.1
Donegal	3.5	0.4-6.5
Mayo	3.4	0.4-6.4
Leitrim	2.7	0-8.0
Tipperary	2.0	0-4.2
Wexford	0.8	0-2.3
Laois	0.0	
Offaly	0.0	
Ireland	9.7	8.7-10.7

Figure 4: Age standardised TB incidence rate per 100,000 population by county in 2001



Geographic origin of TB cases

Sixty three of the TB patients (16.5 % of all notified cases) were known to have been born outside Ireland. The corresponding figure for 2000 was 11.1% and was 13.9% in 1999 and 8.3% in 1998. This represents a 43.2% increase on 2000 (n=44). In 2001, the non-national patients with TB originated from at least 22 countries. Five cases were known not to have been born in Ireland, but the country of birth was not recorded. Twenty seven cases were born in Africa, 21 in Asia, 9 in Europe and one in South America. TB cases in non-nationals are shown in tables 9 and 10 by health board and country of origin respectively.

Table 9: Cases of TB in non-national patients

Health Board	Born outside Ireland	% of health board cases
ERHA	36	20.8
MHB	1	14.3
MWHB	2	8.3
NEHB	7	18.4
NWHB	2	15.4
SEHB	3	15.0
SHB	8	11.1
WHB	4	11.8
Total	63	16.5

Table 10: Countries of origin of non-national patients with TB

Country of Birth	Cases
Angola	2
Bangladesh	1
Brazil	1
China	5
Congo BR	2
Estonia	1
India	4
Indonesia	1
Italy	1
Latvia	1
Nigeria	13
Pakistan	6
Phillipines	3
Portugal	1
Romania	2
Sierra Leone	1
Somalia	3
South Africa	3
Syria	1
Uganda	1
United Kingdom	3
Zimbabwe	2
Unknown [†]	5
Total	63

[†]Country of origin not available for 5 cases

Diagnostic classification

The diagnostic categories reported for Ireland and by health board are shown in tables 11 and 12 respectively. Pulmonary TB was diagnosed in 253 (66.4%) of the 381 cases notified in 2001, of which 159 (62.8%) were laboratory-confirmed by culture. A further 20 pulmonary cases were laboratory-confirmed by microscopy only (5.2%).

Pulmonary and extrapulmonary TB was diagnosed in 35 (9.2%) cases, of which 23 (65.7%) were laboratory-confirmed by culture. An additional 2 cases were confirmed by histology only.

Extrapulmonary TB was diagnosed in 92 (24.1%) cases of which 42 (45.7%) were laboratory-confirmed by culture. Twenty four of the 92 cases were histology positive, 15 of which were culture positive and 9 of which were laboratory confirmed by histology only.

Laboratory confirmation by culture was therefore available for 224 (58.8%) of the 381 cases notified in 2001. A further 20 cases were laboratory-confirmed by microscopy only and an additional 11 cases were confirmed by histology only. Thus, the total number of cases laboratory-confirmed by culture, microscopy or histology was 255 (66.9%).

Definite cases

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 (EuroTB, 1999). In 2001, 58.8% (224/381) of all TB cases notified were culture positive. This is similar to the 2000 figure of 58% (229/395). In 1999, 55.4% of TB cases in Ireland were culture positive and in 1998, 56.8% of cases were culture positive.

Table 11: Diagnostic categories of TB cases in Ireland, 2001

Diagnosis	No. cases	%
Pulmonary	253	66.4
Pulmonary+Extrapulmonary	35	9.2
Extrapulmonary	92	24.1
Unspecified	1	0.3
Total	381	100

Table 12: Diagnostic categories of TB cases by health board, 2001

Health Board	Pulmonary		Extrapulmonary		Pulmonary + Extrapulmonary		Unknown		Total
	n	%	n	%	n	%	n	%	n
ERHA	115	66.5	41	23.7	16	9.2	1	0.6	173
MHB	5	71.4	1	14.3	1	14.3	0		7
MWHB	17	70.8	6	25.0	1	4.2	0		24
NEHB	24	63.2	9	23.7	5	13.2	0		38
NWHB	9	69.2	2	15.4	2	15.4	0		13
SEHB	12	60.0	5	25.0	3	15.0	0		20
SHB	44	61.1	21	29.2	7	9.7	0		72
WHB	27	79.4	7	20.6	0		0		34
Total	253	66.4	92	24.1	35	9.2	1	0.3	381

Pulmonary TB*

There were 288 cases with a pulmonary disease component (75.6%). Sputum smear and culture status for these cases are presented in table 13. Sputum microscopy results were available for 250 (86.8%) of the 288 cases with a pulmonary disease component notified in 2001. This is comparable to the figure from 2000 of 84.1%.

Table 13: Sputum smear and culture status for pulmonary TB cases, 2001

	Sputum +ve	Sputum -ve	Sputum not done	Sputum unknown	Total
Culture +ve	112	60	8	2	182
Culture -ve	2	43	2	1	48
Culture not done	0	0	5	1	6
Culture unknown	18	15	6	13	52
Total	132	118	21	17	288

* WHO defines pulmonary TB, for the purpose of analysis, as any case that has a pulmonary disease component.

Pulmonary smear positive cases

In Ireland in 2001, 128 (44.4%) of the 288 cases with a pulmonary disease component were smear positive*. There were a total of 132 cases where at least one sputum specimen was positive for AFB by microscopy.

Extrapulmonary disease sites

One hundred and twenty seven (33.3%) of the cases reported in 2001 had an extrapulmonary disease component. The extrapulmonary sites reported are shown in table 14.

Table 14: Extrapulmonary disease sites in notified cases, 2001

Site	Number
Pleural	48
Lymph-intrathoracic	5
Lymph-extrathoracic	17
Spinal	6
Bone/Joint other than Spine	4
Meningitis [†]	2
CNS other than meningitis	0
Genitourinary	11
Disseminated	5
Peritoneal/digestive	6
Other [‡]	10
Site not reported	13
Total	127

[†]One meningitis case also had a genitourinary component described.

[‡]Other sites reported included skin abscess, neck abscess, subphrenic abscess, perianal abscess, supraclavicular node, pericardium, bronchial effusion, panuveitis and ovaries.

TB meningitis

There were 2 cases of TB meningitis in 2001 giving an incidence rate of 0.5 cases per million. This compares to 6 cases in 2000, 7 cases in 1999 and 6 cases in 1998. Some details on these cases are provided in table 15. The cumulative incidence rates of TB meningitis in the health boards and in Ireland for 1998-2001 are shown in table 16.

Table 15: TB meningitis cases in Ireland, 2001

Health Board	Age group (years)	History of BCG	Diagnosis
SHB	15-24	N	Confirmed
SHB	25-34	U	Confirmed
Total	2 cases		

Table 16: Cumulative incidence rate of TB meningitis in Ireland, 1998-2001

Health Board	Cases 1998-2001	Cumulative incidence rate	95% CI
ERHA	6	0.44/100,000	0.09-0.80
NEHB	2	0.61/100,000	0-1.47
NWHB	2	0.92/100,000	0-2.21
SHB	9	1.60/100,000	0.55-2.64
WHB	1	0.27/100,000	0-0.81
SEHB	1	0.25/100,000	0-0.73
Ireland	21	0.56/100,000	0.32-0.80

Based on the definition of the Report of the Working Party on Tuberculosis.

Culture status

Figure 5 shows the breakdown by health board of the 224 culture positive TB cases notified in 2001. The isolate was not specified in 12 cases. Of the 212 cases where isolates were specified, there were 7 cases of TB as a result of infection by *Mycobacterium bovis* and one case of TB as a result of infection by *Mycobacterium africanum*. Table 17 shows the breakdown of isolates cultured in TB cases notified in Ireland in 2001.

Figure 5: TB culture positive cases by health board, 2001

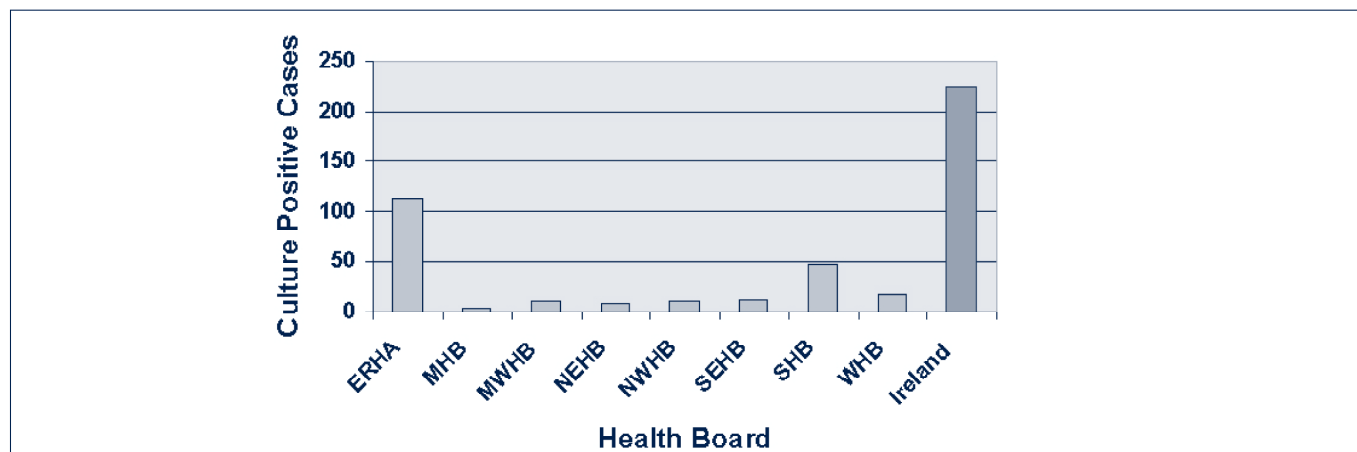


Table 17: Isolates detected in TB notifications in Ireland in 2001

Isolate	No	(%)
<i>Mycobacterium tuberculosis</i>	204	96.2
<i>Mycobacterium bovis</i>	7	3.3
<i>Mycobacterium africanum</i>	1	0.5
Total	212	100

Antibiotic resistance

Resistance was documented in fourteen cases out of a total of 204 *M. tuberculosis* isolates (6.9%). Mono-resistance to isoniazid was recorded in four cases, mono-resistance to streptomycin in three cases and mono-resistance to pyrazinamide in one case. Three cases were resistant to isoniazid and streptomycin and one case was resistant to isoniazid, streptomycin and ethambutol. In 2001, two multi-drug resistant[†] (MDR-TB) TB cases were notified. Six of the drug-resistant cases were born outside Ireland.

Table 18: Sensitivity results of resistant cases in Ireland, 2001 (+ indicates resistance)

	Isolate	Isoniazid	Rifampicin	Pyrazinamide	Ethambutol	Streptomycin
Pulmonary	M. tb	+	+			
Pulmonary	M. tb	+	+		+	
Pulmonary	M. tb	+				
PulmonaryExtrapulmonary	M. tb	+			+	+
Pulmonary	M. tb	+				+
Pulmonary	M. tb	+				+
Pulmonary	M. tb	+				+
Pulmonary	M. tb	+				
Pulmonary	M. tb	+				
Extrapulmonary	M. tb	+				
PulmonaryExtrapulmonary	M. tb			+		
Pulmonary	M. tb					+
Pulmonary	M. tb					+
Pulmonary	M. tb					+

[†]Multidrug resistance is defined as resistance to at least isoniazid and rifampicin.

HIV and TB

Seven patients were reported as having HIV in association with TB. In six of these cases, the TB disease had a pulmonary component. Five were culture positive for *M. tuberculosis*. None of these cases were resistant to standard antituberculous drugs. There were two deaths in this group, one of which was attributed to TB.

Outcomes

Treatment outcome

Of the 381 cases notified in 2001, the outcome was recorded in 230 cases (60.4%). One hundred and eighty nine cases (82.2%) completed treatment. Eleven patients (4.8%) were recorded as being lost to follow up. There were 22 deaths (9.6%) from all causes recorded. Treatment was interrupted in 7 (3.0%) cases and one case was continuing to receive treatment at time of reporting (0.4%).

Deaths

There were 22 deaths among the 381 cases of TB notified in 2001 (5.8%). In five of these cases, TB was recorded as the cause of death (1.3% of cases notified). In 2000, this figure was 6, in 1999 it was 9 and in 1998 it was 6.

Discussion

This is the fourth national report on the epidemiology of TB in Ireland produced by the National Disease Surveillance Centre (NDSC). This report is based on data from the enhanced national TB surveillance system (NTBSS 2000) that became operational in all health boards in Ireland on January 1st, 2000. This new system is based on the minimum data set required to be reported by Ireland to Euro TB, the European agency, located at the Institut de Veille Sanitaire in Paris, that collates national TB data within Europe and contributes epidemiological data to the WHO global TB control programme for Europe.

In 2001, the total number of cases notified nationally in the TB notification system fell to 381 cases, representing a decrease of 3.5% on the 395 cases reported in 2000. The crude incidence rate for 2001 was 9.7 cases per 100,000 population, compared with a corresponding rate of 10.1 reported in 2000. This represents the lowest TB incidence rate reported in Ireland over the past decade. Before 1998 the crude incidence rate had been falling consistently through the nineties until 1997 when it was down to 11.5/100,000. 1998 saw a slight increase in the crude incidence rate in Ireland to 11.7/100,000 population and in 1999, the incidence rate increased to 12.9/100,000. The crude incidence rate reported in 2000 was 10.1/100,000 population and represented a 15.8% decrease on the previous year.

The crude incidence rate for tuberculosis shows significant variation across the health boards with the highest incidence rate in 2001 seen in the Southern Health Board, where 12.4 cases of TB per 100,000 population were notified, a lower rate than that seen in the same health board in 2000 (14.6/100,000). The second highest crude incidence rate seen in 2001 was in the Eastern Regional Health Authority where 12.3 cases per 100,000 population were notified, showing a slight increase on the crude rate reported in the ERHA in 2000 (11.0/100,000). In 2000 the highest crude incidence rate for TB reported had been in the Mid Western Health Board where 14.8 cases per 100,000 population were notified. In 2001, the MWHB showed the largest decrease in crude incidence rates from 14.8/100,000 population in 2000 to 7.1/100,000 population in 2001. Crude incidence rates also decreased between 2000 and 2001 in the MHB, SEHB and WHB. Furthermore, the incidence rates reported in the MHB (3.1/100,000 population) and the SEHB (4.7/100,000 population) were significantly lower than the national crude incidence rate of 9.7/100,000.

Looking at the incidence rates for the indigenous population in each health board, the rate in the Southern Health Board was the highest observed in 2001 at 12.4 cases per 100,000 population, with the rate for the Eastern Regional Health Authority remaining second highest at 10.9/100,000 population. In 2001, 16.5% (n=63) of all cases of TB notified were known to have been born outside Ireland. This is greater than the corresponding figure reported in 2000 when 11.4% of all TB cases notified had been born outside of Ireland, and in 1999, when 13.8% of all TB cases notified had been born outside of Ireland. This represented an increase on the 1998 figure of 8.3%, yet comparisons with other European countries (e.g. Norway, Sweden, Denmark and Switzerland) where more than 50% of tuberculosis cases are in patients of foreign origin¹, show that it is still one of the lowest proportions of TB cases in non-nationals in the EU.

In Ireland, in the early nineties, there were relatively few applications for asylum. By 1995, this had increased to just

over 400 applications for asylum in the year and in 2000, there were just under 11,000 applications for asylum made in Ireland, many from people from countries with a high incidence of TB. Given this relatively recent increase in the arrival of asylum seekers in Ireland, which has been accompanied by a significant increase in the arrival of expatriates from other states in Europe seeking employment opportunities, many from countries with a higher incidence of TB than that seen in Ireland, there is a strong case for maintaining effective enhanced TB surveillance in these and other high-risk groups, so that it is possible to monitor the epidemiology of TB in these subgroups.

The sex ratio among TB cases notified nationally was 1.7:1, males to females. However, higher ratios were seen in the Mid Western Health Board and the North Western Health Board where the ratios were 3.0:1 and 2.3:1 respectively. No health board had a female preponderance.

In 2001, 224 of all cases of TB notified (58.8%) were culture positive. This figure is comparable to that reported in 2000. The total number of cases laboratory confirmed by culture, microscopy or histology was 255 cases (66.9%). A total of 126 cases were not laboratory confirmed in 2001 and this number included 84 cases with a pulmonary component.

Resistance was documented in 14 cases out of a total of 204 *M. tuberculosis* isolates (6.9%). There were 2 cases of multi-drug resistance (MDR) reported in 2001, with resistance to at least isoniazid and rifampicin. This is comparable with corresponding figures from 1999 and 2000 where 2 and 3 MDR cases respectively were reported. Mono-resistance to isoniazid was recorded in four cases in 2000, mono-resistance to streptomycin in three cases, and mono-resistance to pyrazinamide was recorded in one case. Drug resistance is an issue that needs to be kept under close surveillance and is something that will be greatly facilitated by the recent establishment of a National TB Reference Laboratory.

It is disappointing that data on the outcome of treatment remains incomplete in many cases. This important information, which includes follow up microbiological data, was only reported in about 60% of cases in both 2000 and 2001. This did, however, represent a considerable increase on the corresponding 1999 percentage. It should still be possible to further improve the availability of this important follow up data in the future.

BCG Vaccination

As reported by the Working Party on Tuberculosis in their Report on Tuberculosis (Department of Health and Children, 1996³), cessation of neonatal BCG should be considered provided certain basic requirements are in place:

- Criterion 1

There is a well functioning Tuberculosis Control Programme

Ireland

Yes.

- Criterion 2

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

Ireland

No.

While data has been available at a local level for many years, national data enabling a detailed epidemiological analysis for the country as a whole was first presented by the NDSC in the 1998 National TB Report.

- 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 2001, the national rate for sputum positive pulmonary TB was 3.3/100,000, while in 2000 and 1999, the rates were 4.0/100,000 and 3.3/100,000 respectively.

- Criterion 5

The average annual notification rate of tuberculosis 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.

In 2001, there were no cases of TB meningitis in children less than five years of age but in 1998 there was a case of TB meningitis in a 1 year old child. That child had not received the BCG vaccination.

- 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 of 0.3/100,000. While the national crude rate in Ireland is <20/100,000 population, the 2001 age specific incidence rate for children 0-14 was 1.9/100,000, more than six times the rate recorded in Sweden when they discontinued neonatal BCG vaccination. In 2000, the age specific incidence rate for children aged 0-14 was also 1.9/100,000. In 1999, the age specific incidence rate for children aged 0-14 was 4.7/100,000 population, almost sixteen times the rate recorded in Sweden and in the 1998, the corresponding figure was 3.5/100,000 population almost twelve times the rate recorded in Sweden when they discontinued BCG vaccination.

In summary, Ireland does not yet meet all of the criteria set by the International Union Against Tuberculosis and Lung Disease for discontinuation of national BCG vaccination programmes⁵.

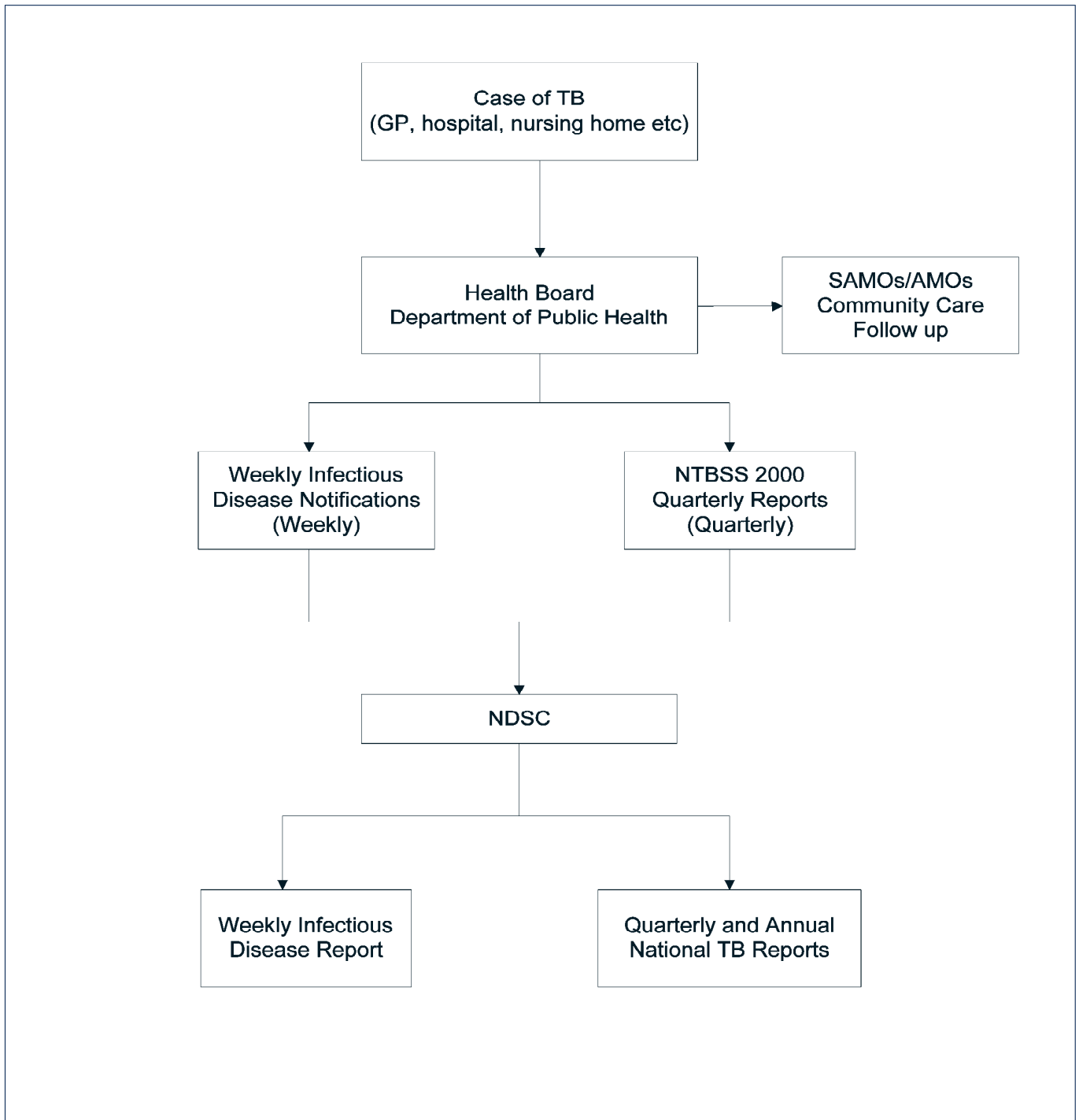
Conclusions

- There was a 3.5% decrease in TB case notifications in 2001 compared to the previous year.
- There was a regional variation in the TB case crude notification rates from 12.4/100,000 population in the Southern Health Board to 3.1/100,000 population in the Midland Health Board.
- The age standardised incidence rates were highest in the ERHA and the SHB at 12.4/100,000 population and lowest in the MHB at 3.1/100,000.
- The male:female ratio among TB cases was 1.7:1 nationally, varying from 3:0 in the Mid Western Health Board to 1.3:1 in the Midland Health Board.
- 16.5% of all TB cases notified in 2001 were in people known to have been born outside of Ireland, an increase on the proportion of non-nationals noted in the previous year (11.4%).
- 75.6% of the TB cases notified in 2001 had a pulmonary component.
- 44.4% of pulmonary TB cases notified in 2001 were sputum smear positive.
- 58.8% of pulmonary TB cases notified in 2001 were culture positive.
- There were 2 cases of MDR-TB notified in 2001.
- Recorded treatment outcome data on TB case notification forms was available on 60.4% of cases notified in 2001.
- There were 2 cases of TB meningitis reported in 2001.
- TB was recorded as the cause of death in 5 cases in 2001 (1.3% of cases notified).

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Appendix 1: Notification pathway for a case of TB



TB is a notifiable disease. A case of TB should be notified to the Department of Public Health in the relevant health board. The Department of Public Health in turn notifies NDSC in 2 ways: (a) in its weekly infectious disease returns to NDSC and (b) through the enhanced TB surveillance system each quarter. NDSC produces a Weekly Infectious Disease Report, which will include TB case notifications. NDSC also produces Quarterly and Annual TB Reports.

Index of Tables and Figures

	Page
Acknowledgements	
Introduction	
Case Definitions	
Materials and methods	
Data analysis	
Results	
<i>Notified TB cases in Ireland</i>	
Table 1: Summary of the epidemiology of TB in Ireland, 2001	6
Table 2: Number of TB notifications in each quarter in 2001	7
Table 3: Notified cases of TB in Ireland 1991-2001 with crude rates per 100,000 population and 3-year moving averages 1992-2000	7
<i>Health board crude incidence rates</i>	
Table 4a: TB cases in each health board in 2001	8
Table 4b: TB cases in each health board in 2001 for the indigenous population only	8
Table 5: Crude TB incidence rates per 100,000 by health board, 1992-2001	8
Table 6: 3 year moving average TB notification rate per 100,000, 1992-2000	8
<i>Age and sex breakdown of TB cases notified in 2001</i>	
Table 7: Sex breakdown of TB cases by health board in Ireland, 2001	9
Figure 1: Age- and sex-specific notification rates per 100,000 population, 2001 Age-standardised TB incidence rates	9
Figure 2: Age-standardised TB incidence rates per 100,000 population by health board with 95% confidence intervals, 2001.	10
Figure 3: Age-standardised TB incidence rate per 100,000 population by health board in 2001	10
Table 8: Age standardised TB incidence rates per 100,000 population by county with 95% confidence intervals, 2001	11
Figure 4: Age standardised TB incidence rate per 100,000 population by county in 2001	11
<i>Geographic origin of TB cases</i>	
Table 9: Cases of TB in non-national patients	12
Table 10: Countries of origin of non-national patients with TB	12
<i>Diagnostic classification</i>	
<i>Definite cases</i>	
Table 11: Diagnostic categories of TB cases in Ireland, 2001	13
Table 12: Diagnostic categories of TB cases by health board, 2001	13
<i>Pulmonary TB</i>	
Table 13: Sputum smear and culture status for pulmonary TB cases, 2001 Pulmonary smear positive cases	13
<i>Extrapulmonary disease sites</i>	
Table 14: Extrapulmonary disease sites in notified cases, 2001	14
<i>TB meningitis</i>	
Table 15: TB meningitis cases in Ireland, 2001	14
Table 16: Cumulative incidence rate of TB meningitis in Ireland, 1998-2001	14
<i>Culture status</i>	
Figure 5: TB culture positive cases by health board, 2000	15
Table 17: Isolates detected in TB notifications in Ireland in 2001	15
<i>Antibiotic resistance</i>	
Table 18: Sensitivity results of resistant cases in Ireland, 2001	15
<i>HIV and TB</i>	
Outcomes	
Treatment outcome	
Deaths	
Discussion	
Conclusions	
References	



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