

National Disease Surveillance Centre

A Report on the Epidemiology of
Tuberculosis in Ireland 1999

June 2001



In Partnership for Prevention and Protection

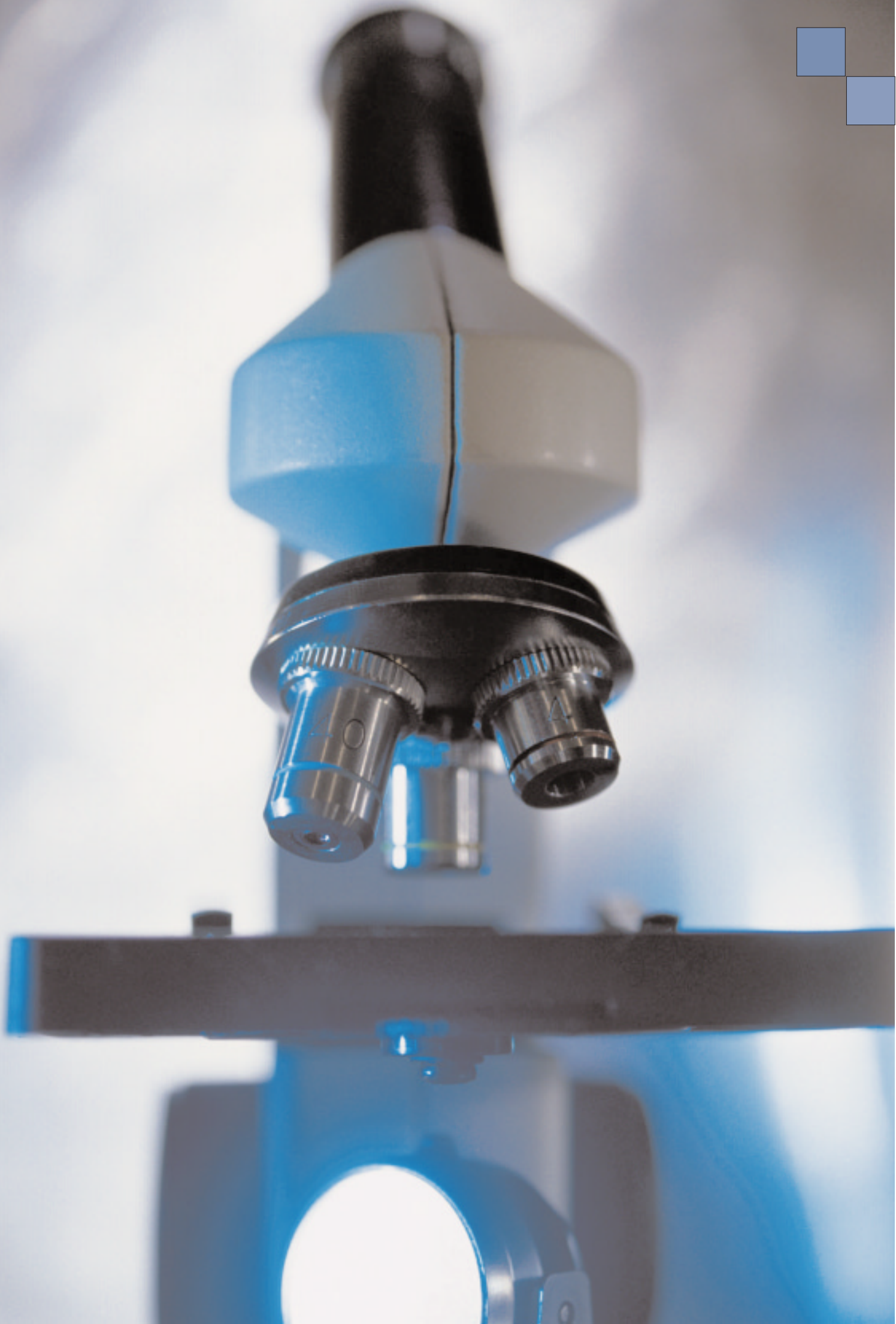


Table of Contents

	Page
Introduction	04
Case definitions	05
Data analysis	06
Summary of the Epidemiology of TB in Ireland 1999	06
National Report on the Epidemiology of TB in Ireland 1999	07
Discussion	23
Conclusions	27
References	28
Appendix 1-Data tables	29
Appendix 2-Notification pathway for a case of TB	31

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Health Boards

Eastern Regional Health Authority (ERHA)
Mid-Western (MWHB)
Midland (MHB)
North Eastern (NEHB)
North Western (NWHB)
South Eastern (SEHB)
Southern (SHB)
Western(WHB)

Counties

Dublin, Kildare, Wicklow
Clare, Limerick, Tipperary N.R.
Laois, Longford, Offaly, Westmeath
Cavan, Louth, Meath, Monaghan
Donegal, Leitrim, Sligo
Carlow, Kilkenny, Tipperary S.R., Waterford, Wexford
Cork, Kerry
Galway, Mayo, Roscommon

Introduction

This document presents the aggregated epidemiological data for cases of tuberculosis notified to each of the eight health boards in Ireland during 1999. Individual case notification forms were completed by Area Medical Officers using the clinical, microbiological and histological data available to them. They were then collated regionally at the Departments of Public Health by the responsible Specialist in Public Health Medicine. Copies of the TB notification forms were then sent to NDSC. Case data were entered onto an Epi-Info TB database.

In July 2000, a summary case data sheet was produced by NDSC for Departments of Public Health in each health board requesting: (a) validation of data, and (b) missing data on each individual case. Validated data was received from each health board by December 2000. A second summary data sheet was then prepared and distributed to each Department of Public Health outlining the data on which analysis would be based.

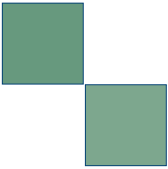


Case Definitions

The case definitions used were those recommended by the National TB Working Group.¹

- **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.
- **Other than definite case** met both of the following conditions: (a) It was the clinician's judgement that the patient's clinical and/or radiological signs and/or symptoms were compatible with tuberculosis, and (b) 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: (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.
- **Primary TB** was defined as a patient with a negative smear, culture or histology specimen but who had radiological signs of hilar lymphadenopathy on chest x-ray and a positive tuberculin skin test or there was clinical evidence that led the physician to treat the patient with a curative course of antituberculosis chemotherapy
- **A Recurrent Case** was defined as a patient with a documented history of TB prior to their 1999 notification
- **Indigenous population** was defined as those who were born in Ireland

Data Analysis



Data were analysed using Epi-Info software version 6.04c. The χ^2 (Chi-square) test was used to compare proportions in groups and 95% confidence intervals (95% CI) were used to compare rates between groups of interest. A three-year moving average was calculated by applying the formula $[(a+2b+c)/4]$ to each three successive points a, b and c (each letter represented a year) in the series and the result was used as the smoothed value of b. Population data were taken from the 1991 and/or 1996 census of population. Direct methods of standardisation were used to allow comparison of rates between geographical areas using the 1996 Irish population as the standard population.

Tables illustrating indigenous rates used 1996 population data that excluded those born outside Ireland (3,596,543 versus 3,626,087).

Summary of the Epidemiology of TB in Ireland 1999

Summary profile of the epidemiology of TB in Ireland 1999	
Total number of cases	469
Notification rate per 100,000	12.9
Cases in foreign born	65
Culture positive cases	260
Smear positive pulmonary cases	124
Isolates resistant to isoniazid alone	4
Isolates resistant to rifampicin alone	0
Isolates resistant to ethambutol alone	0
Isolates resistant to streptomycin alone	0
Multi-drug resistant isolates	2
Deaths attributable to TB	9

National Report on the Epidemiology of TB in Ireland, 1999

Total cases

There were four hundred and sixty nine cases (469) of TB notified in 1999.

Notification Rate

The notification rate was 12.9/100,000 population, a 10.2% increase on 1998 (11.7/100,000), see Table 1. Health board rates in 1999 are shown in Table 2a

Table 1.

Table 1. Notified cases of TB in Ireland 1991-1999

Year	Number	Incidence Rate per 100,000	3 yr moving av.
1991	640	18.2	
1992	604	17.1	621
1993	598	16.9	581
1994	524	14.5	526
1995	458	12.6	468
1996	434	12	438
1997	416	11.5	426
1998	424	11.7	430
1999	469	12.9	

Table 2a.

Notified cases of TB in each health board in 1999

Health Board	Cases	Incidence Rate/100,000	95% CI for Rate
ERHA	180	13.9	11.9-15.9
MHB	15	7.3	3.6-11.0
MWHB	54	17.0	12.5-21.6
NEHB	25	8.2	5.0-11.4
NWHB	19	9.0	5.0-13.1
SEHB	31	7.9	5.1-10.7
SHB	75	13.7	10.6-16.8
WHB	70	19.9	15.2-24.5
Ireland	469	12.9	11.8-14.1

Table 2b.

Notified cases of TB in each health board in 1999 (Indigenous Population)			
Health Board	Cases	Crude Rate/100,000	95% CI for Rate
ERHA	136	10.5	8.8-12.3
MHB	15	7.4	3.6-11.1
MWHB	53	16.8	12.3-21.4
NEHB	20	6.6	3.7-9.5
NWHB	18	8.7	4.7-12.7
SEHB	24	6.2	3.7-8.7
SHB	72	13.3	10.3-16.4
WHB	66	19.0	14.4-23.6
Ireland	404	11.2	10.1-12.3

Health board rates, which exclude those born outside Ireland, are shown in table 2b

Notification Quarter

Notification of TB was lowest in the fourth quarter and highest in the third quarter, see Table 3.

Table 3.

Number of notifications of TB in each quarter in 1999		
1999	No. cases notified	Percentage (%)
January-March	107	22.9
April-June	122	26.2
July-September	143	30.7
October-December	94	20.2
Total	466*	100
*3 cases could not be allocated to a yearly quarter		

Health Board Notification rates 1992-1999

The crude incidence rate seen in each health board in the period 1992-1999 are shown in Table 4.

Table 4.

Crude incidence rates 1992-1999								
Health Board	1992	1993	1994	1995	1996	1997	1998	1999
ERHA	16.2	11.6	13.4	12.4	8.7	9.9	11.7	13.9
MHB	18.7	10.8	14.7	8.9	8.3	9.7	5.4	7.3
MWHB	20.9	18.0	17.7	15.4	17.7	15.1	14.8	17.0
NEHB	10.0	7.8	18.3	8.7	10.1	9.8	9.5	8.2
NWHB	15.9	26.3	9.1	11.5	7.1	8.5	9.0	9.0
SEHB	12.3	16.4	11.2	9.7	6.9	12.8	8.9	7.9
SHB	21.5	23.3	17.8	21.0	22.5	17.4	14.3	13.7
WHB	22.2	22.5	23.3	11.4	13.1	10.8	15.3	19.9
Total	17.1	17.0	14.9	13.0	12.0	11.5	11.7	12.9

3-Year Moving Average Incidence Rates

The 3-year moving average incidence rate for each health board for the period 1992-1998 is shown in table 5.

Table 5.

Three year moving average incidence rate per 100,000 (1992-1998)							
Health Board	1992	1993	1994	1995	1996	1997	1998
ERHA	14.5	13.2	12.7	11.7	9.9	10.1	11.8
MHB	15.8	13.7	12.3	10.2	8.8	8.3	7.0
MWHB	20.0	18.7	17.2	17.2	16.5	15.7	15.4
NEHB	10.0	11.0	13.3	11.3	9.7	9.8	9.3
NWHB	20.3	19.4	14.0	9.3	8.6	8.3	8.9
SEHB	12.5	14.1	12.1	9.4	9.1	10.4	9.6
SHB	21.6	21.5	20.0	20.6	20.9	17.9	14.9
WHB	26.0	22.6	20.0	14.6	12.1	12.5	15.3

Age Standardised Incidence Rates

Age standardised TB incidence rates and 95% CI are shown in Appendix 1 (Table 6) and Figure 1 below. The rates in the MHB and SEHB were significantly lower than the national rate.

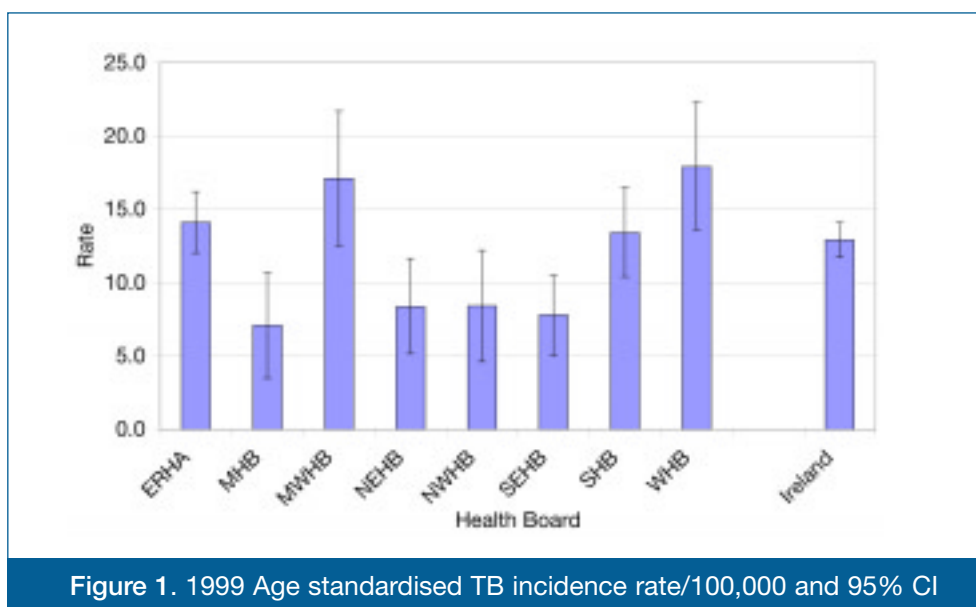


Figure 1. 1999 Age standardised TB incidence rate/100,000 and 95% CI

Age Specific Health Board Rates

Age specific health board TB incidence rates in 1999 are shown in Figure 2.

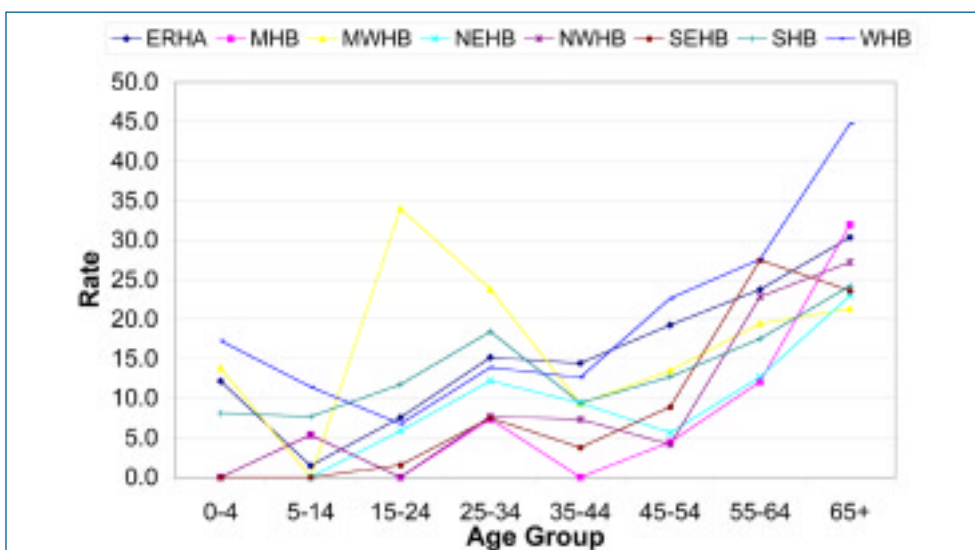


Figure 2. Age specific incidence rates per 100,000 in health boards.

In 1999, as in 1998, the WHB and the MWHB had the highest rates of TB in Ireland and the MWHB continues to have the highest incidence rate in the 15-24 (statistically significant) and 25-34 year old age group. In 1999, the WHB and MWHB had the highest rates of TB in the 0-4 year age group.

Sex

There were 284 males (61%) and 185 females (39%), which gave a male/female ratio of 1.5. Table 7 gives the sex breakdown of notified TB cases in 1998.

Table 7.

Sex breakdown of TB cases in Ireland in 1999.

Health Board	Males	Females	Male/female ratio
ERHA	109	71	1.5
MHB	9	6	1.5
MWHB	32	22	1.5
NEHB	12	13	0.9
NWHB	12	7	1.7
SEHB	20	11	1.8
SHB	41	34	1.2
WHB	49	21	2.3
Total	284	185	1.5

Age and sex specific rates nationally

The national age and sex specific rates are shown in Appendix 1 (Table 8) and Figure 3

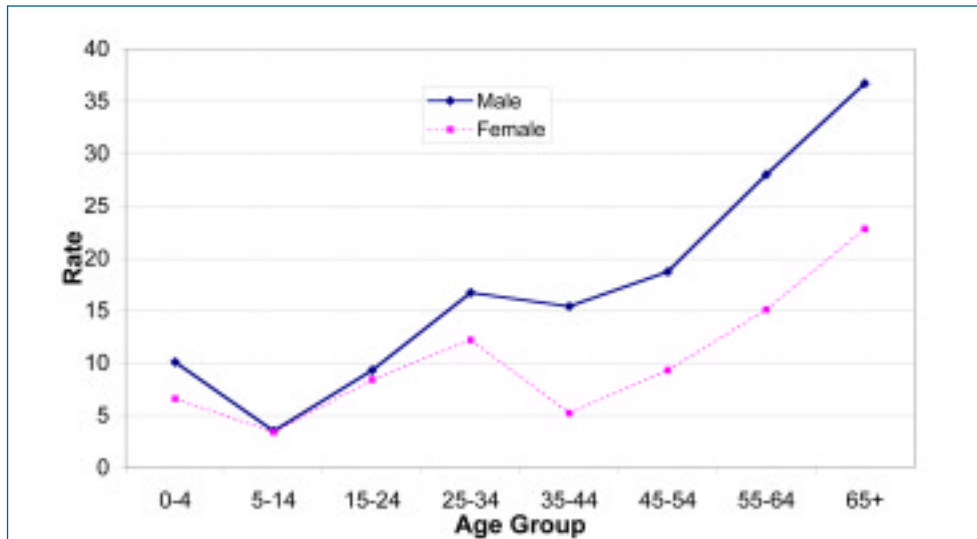


Figure 3. Age and sex specific rates per 100,000 in 1999

Geographic origin of TB cases

Sixty five patients (13.8%) were born outside Ireland. The corresponding percentage for 1998 was 8.3%. They originated from 24 countries. Cases by health board and country of origin are shown in table 9 and table 10 respectively.

Table 9.

Cases of TB in foreign-born patients		
Health Board	Born outside Ireland	% of health board cases
ERHA	44	24.0
MHB	0	0
MWHB	1	1.9
NEHB	5	20.0
NWHB	1	5.3
SEHB	7	22.6
SHB	3	4.0
WHB	4	5.7
Total	65	13.8

The non-national population did not differ from the Irish population in terms of sex, disease category, sputum or culture status but they were younger ($p < 0.0001$).

Table 10.**Country of origin of foreign-born TB patients.**

Country of Birth	Cases
Angola	2
Bangladesh	2
China	2
England	8
Ethiopia	1
India	6
Ivory Coast	1
Japan	1
Kosovo	14
Malaysia	1
Moldova	1
New Zealand	1
Nigeria	4
Pakistan	8
Philippines	1
Romania	2
Russia	1
Slovakia	1
Somalia	1
Spain	1
Sri Lanka	1
Sudan	2
Vietnam	1
Zaire	2
Total	65

Age-Standardised Incidence Rate by County

The age standardised incidence rate of each county is shown in Table 11. The rate in Kildare is somewhat artificial in that 10 of the 25 cases of TB that occurred were in foreign-born patients including 7 from Kosovo, 1 from Slovakia, 1 from India and 1 from China. There were 11 cases of TB in Kildare in 1998 and 8 cases provisionally reported for 2000.

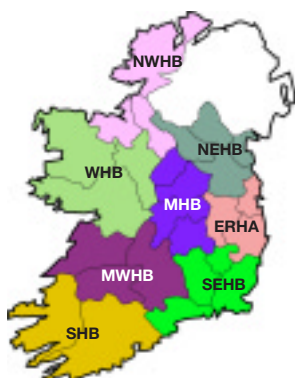
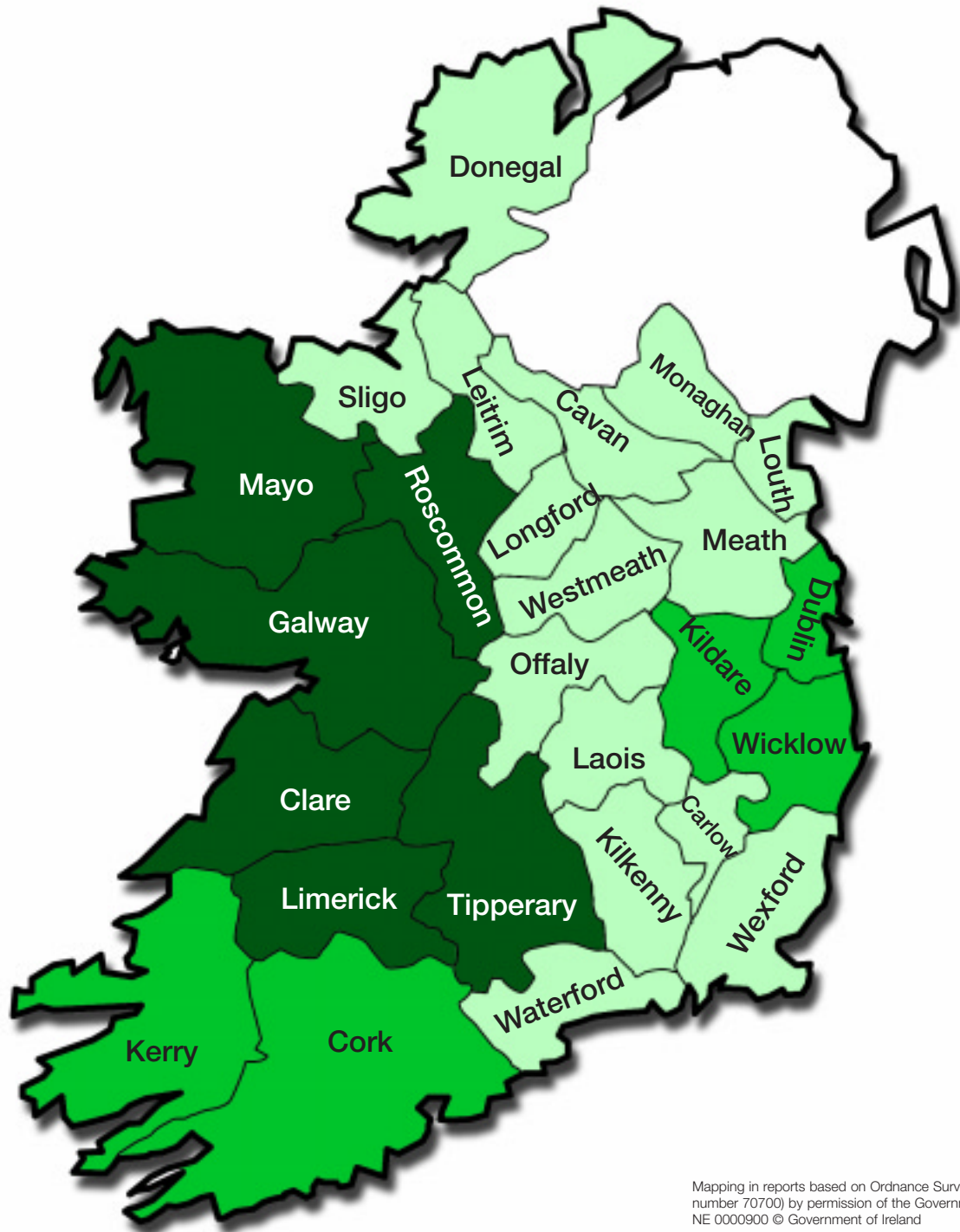
Galway had a significantly higher rate (22.5/100,000; 95% CI 15.8-29.3) than the national rate (12.9/100,000; 95% CI 11.8-14.1). Wexford, Donegal, Laois, Monaghan, Kilkenny and Offaly had significantly lower rates than the national rate.

Table 11.

Age standardised incidence rate and 95% CI by county in 1999.		
County	Incidence rate/100,000	95% CI
Galway	22.5	15.8-29.3
Kildare	20.2	12.1-28.3
Clare	18.5	9.7-27.3
Limerick	17.7	11.4-24.0
Roscommon	16.4	6.0-26.9
Longford	15.9	18.1-29.9
Dublin	14.0	11.8-16.3
Sligo	13.9	4.2-23.6
Cork	13.5	10.0-17.0
Waterford	13.4	6.1-20.7
Kerry	12.7	6.6-18.7
Louth	12.1	4.9-19.2
Mayo	11.2	5.0-17.3
Tipperary	8.9	3.9-14.0
Leitrim	8.6	0-18.5
Meath	8.1	5.5-13.7
Westmeath	7.8	0.9-14.6
Carlow	7.5	0-16.0
Wicklow	7.0	1.8-12.2
Cavan	6.6	0.1-13.2
Wexford	6.6	1.7-11.4
Donegal	5.8	1.8-9.9
Laois	5.5	0-11.2
Monaghan	4.0	0-9.6
Kilkenny	3.8	0-8.0
Offaly	3.0	0-7.8
Ireland	12.9	11.8-14.1

Figures 4 and 5 illustrate age standardised TB rates by health board and county in Ireland in 1999. Figure 6 illustrates the 1998 age standardised county rate in 1998.

Figure 4. Age standardised health board rate per 100,000 population in 1999.



Rate/100,000

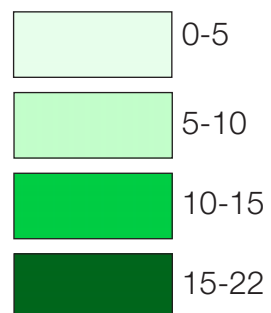
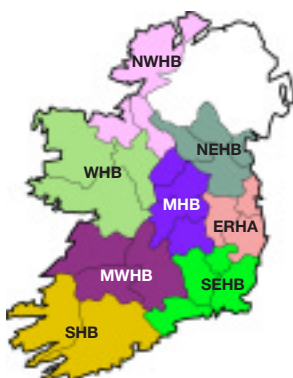
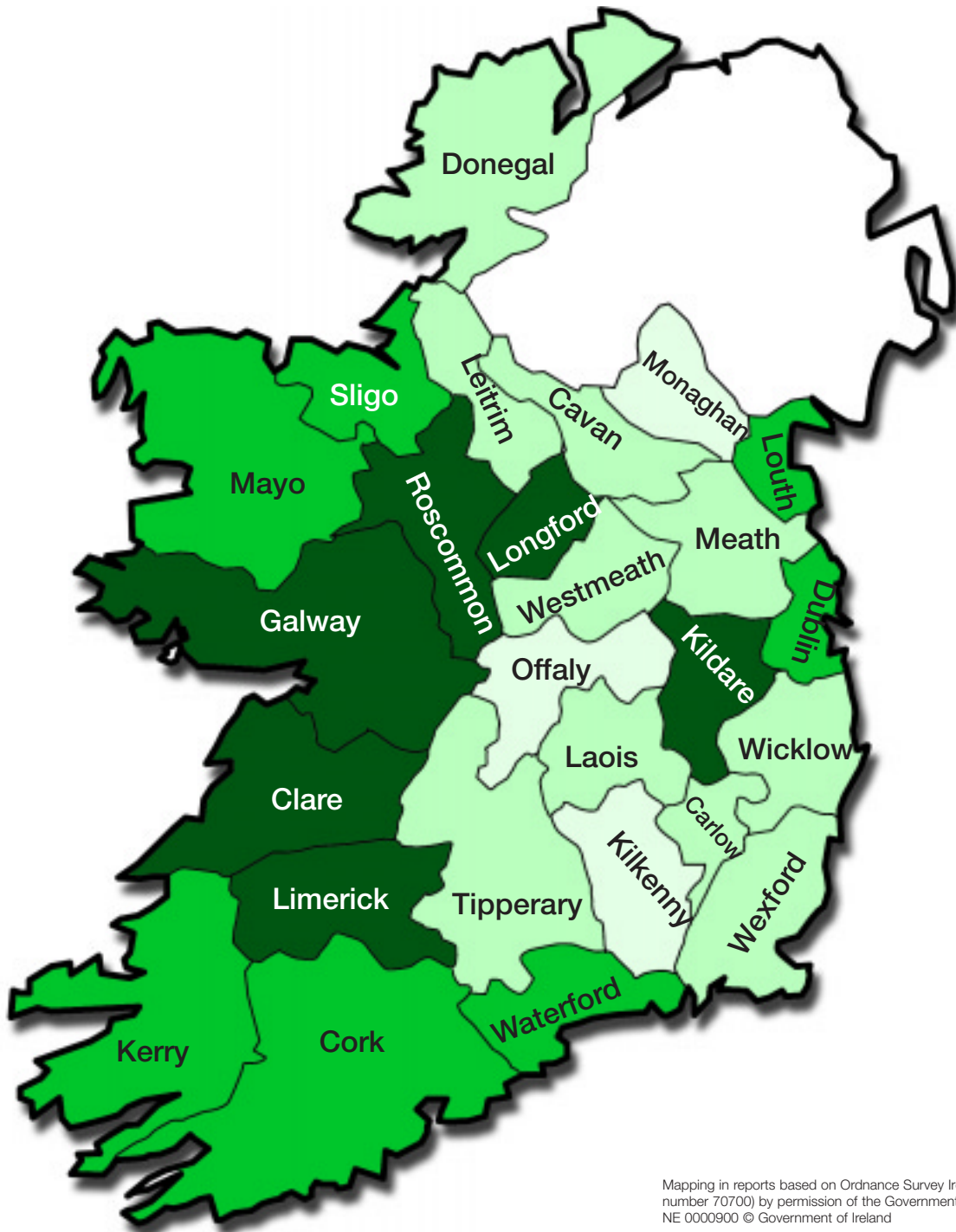


Figure 5. Age standardised county rate per 100,000 population in 1999.



Rate/100,000

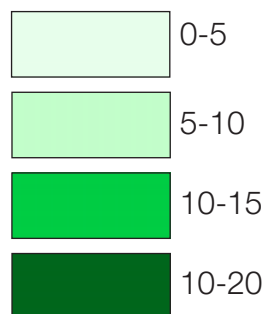
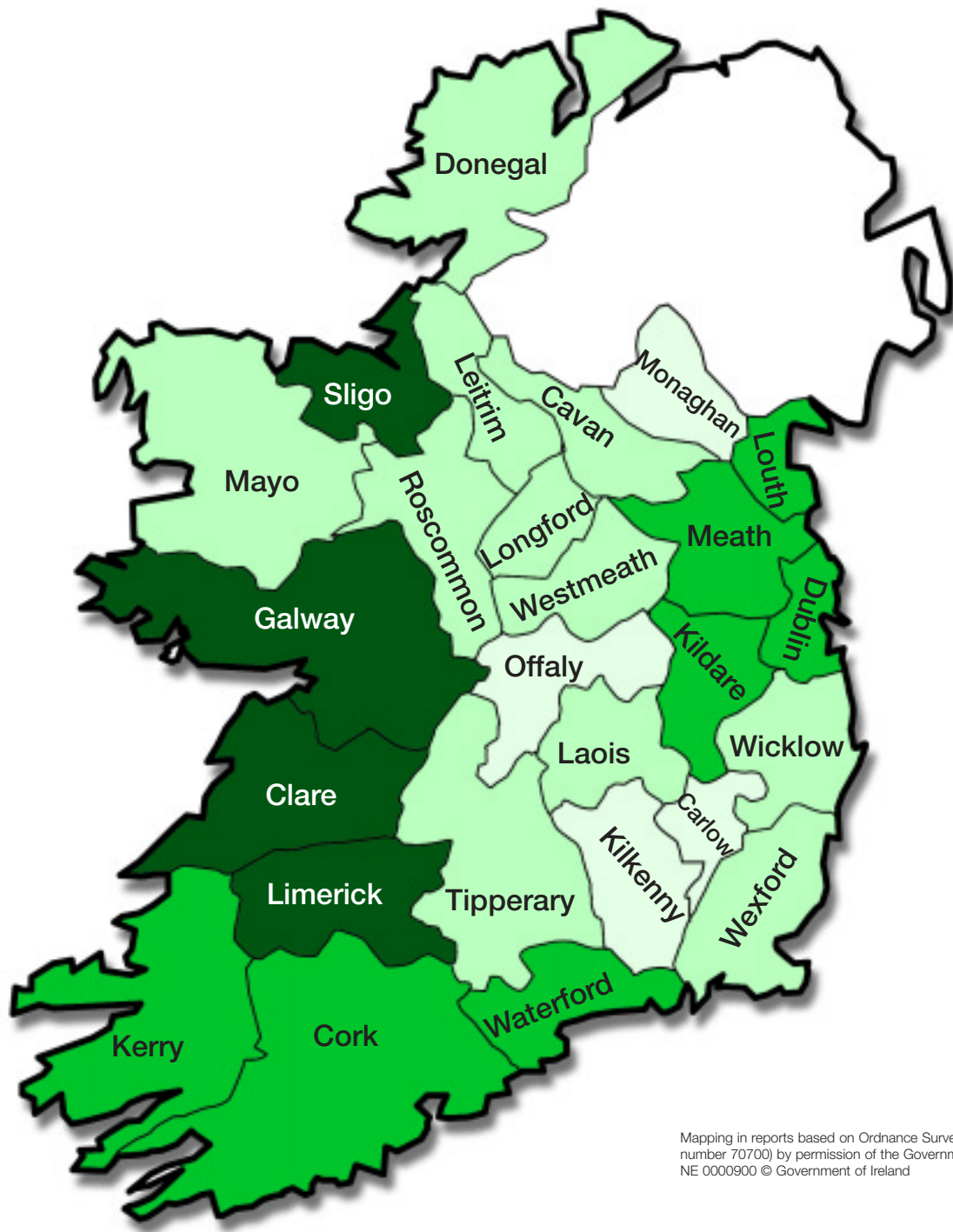


Figure 6. Age standardised county rate per 100,000 population in 1998.



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Diagnostic Classification

Pulmonary TB alone was diagnosed in 306 cases, of which 184 (60.1%) were laboratory confirmed. Pulmonary and extrapulmonary TB was diagnosed in 22 cases, of which 18 (81.8%) were laboratory confirmed. Extrapulmonary TB was diagnosed in 110 cases of which 37 (33.6%) had positive histology. Primary TB was diagnosed in 27 cases, 18 males and 9 females. Of these 27, there were 16 cases in the 0-4 year age group, 9 in the 5-14 year age group and 2 in the 15-24 year age group, see Table 12. Figure 7 shows the distribution of disease categories by age group. There was no difference in the distribution of pulmonary disease by sex. Table 13 shows the diagnostic categories of TB by health board in 1999.

Table 12.

Diagnostic categories of TB cases in 1999.	
Diagnosis	No. cases (%)
Pulmonary	306 (65.2%)
P+E	22 (4.7%)
Extrapulmonary	110 (23.5%)
Primary	27(5.8%)
Unknown	4 (0.9%)
Total	469 (100%)

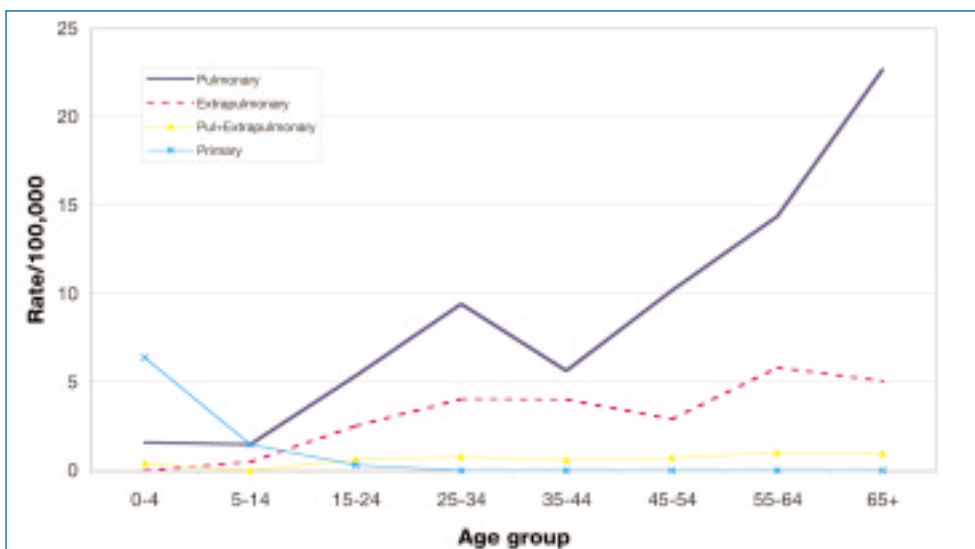


Figure 7. Distribution of TB disease by age group.

Table 13.

Diagnostic categories of TB by health board in 1999.					
Health Board	P	E	P+E	Pri	Total*
ERHA	124	36	11	9	180
MHB	13	0	2	0	15
MWHB	27	24	0	3	54
NEHB	14	8	3	0	25
NWHB	12	4	1	2	19
SEHB	23	7	1	0	31
SHB	43	23	4	4	74
WHB	50	8	0	9	67
Total	306	110	22	27	465

P=Pulmonary, E=Extrapulmonary, Pri=Primary
 * Diagnostic category missing on 4 cases at time of report.

Table 14.

Sputum smear and culture status for pulmonary TB cases 1999.					
	Sputum +ve	Sputum -ve	Sputum not done	Sputum Unknown	Total
Culture+ve	116	63	17	6	202
Culture-ve	2	70	7	5	84
Culture not done	1	2	3	0	6
Culture unknown	5	16	9	6	36
Total	124	151	36	17	328

Pulmonary TB

There were 328 cases with a pulmonary disease component (69.9%). Sputum smear and culture status for these cases are shown in Table 14.

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

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.² In Ireland in 1999, 55.4% (260/469) of TB cases in Ireland were culture positive, see Appendix 1 (Table 15a) and Figure 8a. In 1998, 56.8% of cases were culture positive. Notification rates of definite cases of TB in the indigenous population are shown in Appendix 1 (Table 15b) and Figure 8b.

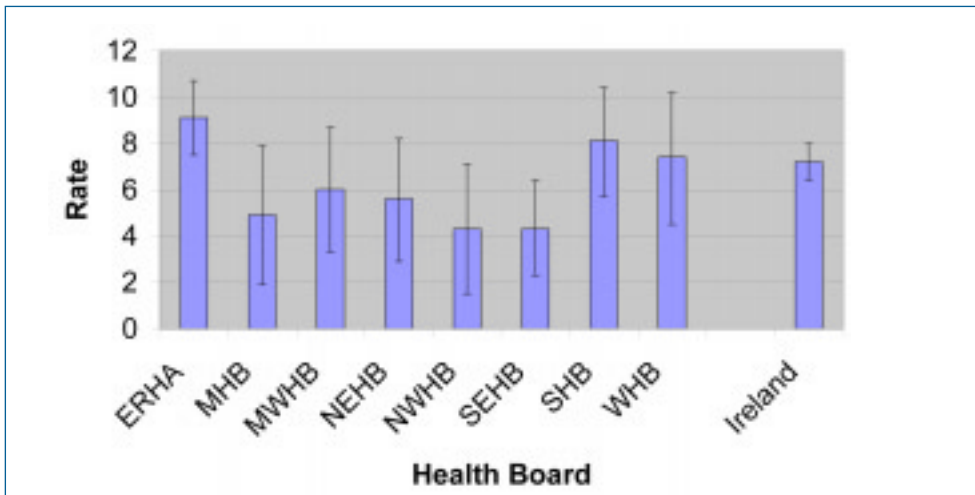


Figure 8a. Rate of definite cases of TB per 100,000 in 1999 and 95% CI.

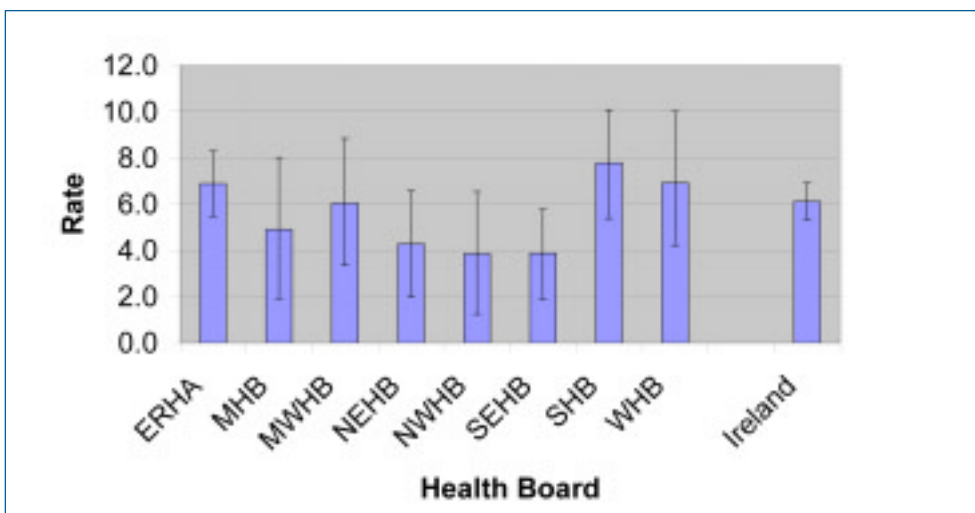


Figure 8b. 1999 rates of definite cases of TB per 100,000 and 95% CI (Indigenous population).

Pulmonary Smear Positive Cases

In Ireland, in 1999, 38% (124/328) of cases with a pulmonary disease component were sputum smear positive, see Appendix 1 (Table 16a) and Figure 9a. In 1998, 38.4% of cases were sputum smear positive.

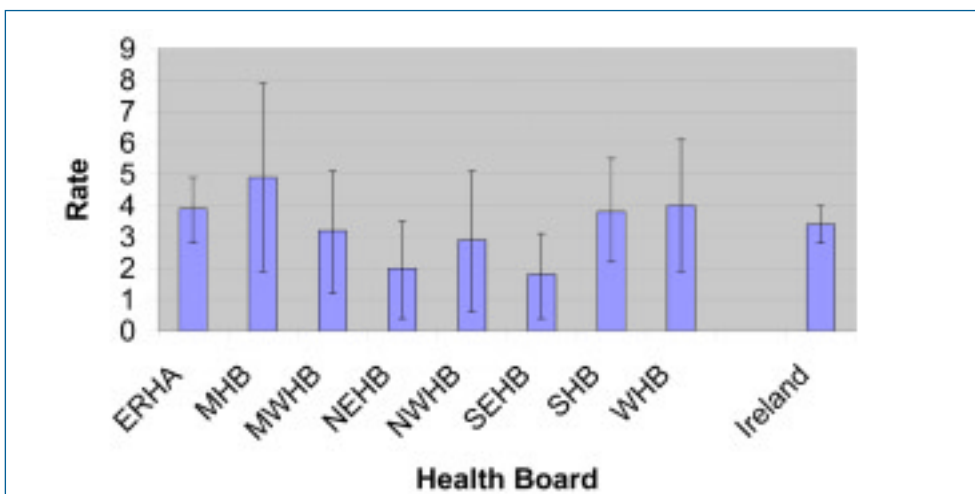
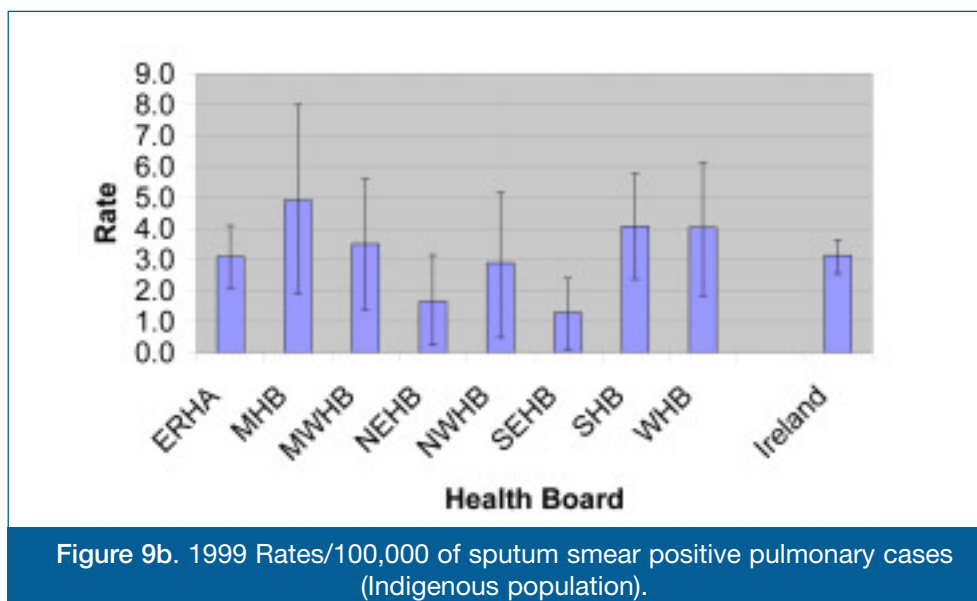


Figure 9a. 1999 rate/100,000 of sputum smear positive pulmonary cases.

Notification rates of sputum smear positive pulmonary TB cases in the indigenous population are shown in Appendix 1 (Table 16b) and Figure 9b.



Extrapulmonary Disease Sites

There were a total of 132 cases with an extrapulmonary disease component. Documented sites of disease are shown in Table 17.

Table 17.

Extrapulmonary disease sites in notified cases in 1999 (n=122/132).

Site	Number
Pleural	34
Lymph-intrathoracic	1
Lymph-extrathoracic	30
Spinal	1
Bone	10
Meningeal	7
CNS	2
Genitourinary	18
Disseminated	4
Peritoneal	2
Other*	13
Total	122

* Other sites included appendix, chest wall abscess, eye, large bowel, larynx, pericardium, peritoneum, skin, small bowel and synovial fluid.

TB meningitis

There were 7 cases of TB meningitis in 1999, see Table 18. There were 6 cases in 1998, see Table 19. The cumulative incidence rates in health boards and in Ireland in the period 1998-1999, inclusive, are shown in Table 20.

Table 18.

TB Meningitis cases in Ireland in 1999			
Health Board Case	Age group	BCG	Diagnosis
ERHA	5-14	Y	Definite
ERHA	15-24	N	Presumed
ERHA	25-34	N	Definite
NEHB	55-64	U	Presumed
SHB	25-34	U	Definite
SHB	55-64	Y	Presumed
SHB	65+	U	Presumed
Total 1999	7 cases		

Table 19.

TB Meningitis cases in Ireland in 1998			
Health Board Case	Age group	BCG	Diagnosis
ERHA	0-4 (1 y.o)	N	Definite
ERHA	35-44	Y	Presumed
NWHB	65+	Y	Presumed
SEHB	55-64	N	Definite
SHB	15-24	U	Presumed
SHB	25-34	N	Presumed
Total 1998	6 cases		

Table 20.

Cumulative Incidence rate of TB meningitis in Ireland 1998-1999			
HB	Cases 1998-1999	Cumulative incidence rate	95% CI
SHB	5	0.91/100,000	0.11-1.72
NWHB	1	0.47/100,000	0-1.40
SEHB	1	0.47/100,000	0-1.40
ERHA	5	0.39/100,000	0.04-0.72
NEHB	1	0.33/100,000	0-0.96
Ireland	13	0.36/100,000	0.16-0.55

Mycobacteria Isolates.

There were 260 culture positive cases, which are shown in Table 21

Table 21.

Isolates detected in TB notifications in Ireland in 1999.	
Isolate	No. (% isolate)
<i>M.tuberculosis</i>	242(95.7%)
<i>M.bovis</i>	11 (4.3%)
Total	253*

*Isolate unavailable on 7 cases at time of report.

Table 22.

Sensitivity results of resistant isolates in Ireland 1999.					
Case	Isolate	Isoniazid	Rifampicin	Pyrazinamide	Streptomycin
Pulmonary	<i>M.tuberculosis</i>	+	+	+	+
Pulmonary	<i>M.tuberculosis</i>	+	+		
Pulmonary	<i>M.tuberculosis</i>	+			
Pulmonary	<i>M.tuberculosis</i>	+			
Pulmonary	<i>M.tuberculosis</i>	+			
Pulmonary	<i>M.tuberculosis</i>	+			

Antibiotic Resistance

Resistance was documented in 6 cases out of a total of 242 *M.tuberculosis* isolates (2.5%), see Table 22. Mono-resistance to isoniazid was recorded in 4 cases. There were two Multi-Drug Resistant-TB isolates (MDR-TB) notified and treated in 1999. Concomitant resistance to at least isoniazid and rifampicin, with or without resistance to ethambutol and streptomycin is defined as multi-drug resistance.

M. bovis

There were 11 *M.bovis* isolates (4.3%) in 1999.

HIV and TB

Six patients had HIV in association with TB. Five cases were pulmonary TB, the sixth pulmonary+extrapulmonary TB. Five were culture positive for *M.tuberculosis*, fully sensitive to standard TB chemotherapy.

Treatment outcome

Seventy five patients (16.9%) had a recorded "treatment completed" outcome. Five patients (1%) had a recorded "lost to follow-up" outcome.

Deaths

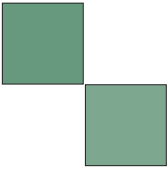
There were 34 deaths amongst the 469 notified cases of TB in Ireland in 1999. In 9 cases (1.9%) TB was the recorded cause of death giving a crude death rate of 0.2/100,000 population, the same as 1998.

Discussion

This is the second national report where the epidemiology of TB has been presented. In Ireland, there was a 10.2% increase in the notification rate in 1999 compared to 1998. This has also been reflected in the 3 year moving average, which for the first time in the 1990s has seen a reversal of the steady downward trend in the number of TB cases seen.

At a national level perhaps the most striking difference is with the notification rates reported from Northern Ireland, the most recent being 3.6/100,000 population.³ Using 1991 data from a national tuberculosis survey for the Republic of Ireland and an examination of individual patient data for Northern Ireland, the incidence of TB in Northern Ireland and the Republic of Ireland was compared in terms of age distribution of cases and the proportion of cases proven bacteriologically as well as the total incidence of reported cases.⁴ Their analysis showed that for all age groups and for the overall incidence there were significantly more cases of tuberculosis reported in the Republic of Ireland compared to Northern Ireland. Consideration to undertaking another North/South collaborative study might be appropriate to examine the reasons for this large difference in case notifications including a comparison of the case definitions used, the laboratory techniques employed for diagnosis, treatment employed and outcomes.

In 1999, 13.8% of all TB cases were born outside Ireland. Although this is a 5% rise on the 1998 figure of 8.3%, when compared to several other European countries, e.g. Norway, Sweden, Denmark and Switzerland, where more than 50% of tuberculosis cases are in patients of foreign origin (EuroTB 1999), it means we still have one of the lowest proportion of TB cases in foreign born patients in the EU. In Ireland, in 1995, there were just over 400 applications for asylum. In 2000, just under 11,000 applications were received (Personal communication, Directorate of Asylum Seeker Support, Department of Justice, 2000). Given this relatively recent upsurge in international immigration into Ireland, many from high incidence TB countries, the case for maintaining and enhancing TB surveillance in these and other high-risk groups is a strong one so that we are in a position to monitor the epidemiology of TB in these subgroups. At present voluntary screening is offered to asylum seekers but not all avail of the service. There may be barriers to partaking in screening including language difficulties, a relatively low priority given to health issues and a perception that ill health may reflect negatively on decisions being made regarding asylum applications. It has been shown that screening of refugees on a voluntary basis when provided in a readily accessible, adequately resourced, clearly explained and organised format can detect important public health problems.⁵ It is in the period immediately following immigration from a high incidence country to a low incidence country that the risk of tuberculosis infection remains highest with the risk of infection gradually diminishing over time.^{6 7 8} Several studies have shown that those who are at highest risk of acquiring disease are those living in closest proximity to the index case.^{9 10 11} It has commonly been



the experience that asylum seekers and refugees are segregated from the indigenous population in terms of work and housing. This fact together with circumstances that often force them to live together under crowded conditions in environments that are conducive to transmission of tuberculosis infection would suggest that those who are at highest risk of tuberculosis infection are those within the asylum seeker and refugee populations and not the indigenous population.

Within Ireland there is quite an obvious east-west divide in the notification rates of TB seen in 1999. As in 1998, the WHB and the MWHB had the highest rates of TB in 1999. These 2 health boards had the highest rates of TB in the 0-4 year old age group. In 1999, the MWHB continued to have the highest incidence rate in the 15-24 (statistically significant) and 25-34 year old age groups. The east-west divide becomes more noticeable when crude rates of TB in the indigenous population are examined (Table 2b). The crude notification rates seen in the WHB and the MWHB are significantly different from the national rate when those born outside Ireland are excluded. Three cases in the MWHB in 1999 were recorded as linked to an outbreak in the SHB in 1999/2000.

Examination of the notification rates according to culture and sputum smear status reveals that the ERHA had the highest culture confirmed rate at 8.9/100,000 but the MHB with the highest smear positive rate (pulmonary cases) at 4.9/100,000 population. When those born outside Ireland are excluded the figures change somewhat in that the SHB has the highest culture confirmed rate (7.8/100,000; 95% CI 5.4-10.1).

Mono-resistance to isoniazid was recorded in 4 cases of TB in 1999. More significantly however there were 2 cases of multi-drug resistance (MDR). With a further 2 cases of MDR provisionally reported for 2000 it is an issue that needs to be kept under surveillance, something that can be greatly facilitated with the establishment of a National TB Reference Laboratory.

It is somewhat disappointing, based on completed TB case notification forms, the recorded outcome of treatment, which includes follow-up microbiological data remains quite limited and extremely variable across different health boards. It would seem appropriate to examine ways, both at local and national level, in which access to this essential follow-up data can be improved.

BCG Vaccination

As reported by the Working Party on Tuberculosis¹ cessation of neonatal BCG should be considered provided certain basic requirements are in place

- **Criteria 1**

There is a well functioning Tuberculosis Control Programme

Ireland - Yes

- **Criteria 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 local level for many years national data enabling detailed national epidemiological analysis was first presented in the NDSC 1998 National TB Report.

- **Criteria 3**

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

Ireland - Yes

- **Criteria 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 - In 1998 and in 1999 the rate was 3.3/100,000.

- **Criteria 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.

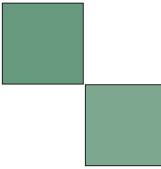
Ireland - **No**. In 1998, there was a case of TB meningitis in a 1 year old child. The child had not received BCG vaccination.

- **Criteria 6**

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

Ireland - Not applicable

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 Ireland does have a notification rate <20/100,000 population, the 1998 age specific incidence rate for children aged 0-14 was 3.5/100,000 population almost **twelve** times the rate recorded in Sweden



when they discontinued BCG. The 1999 age specific incidence rate for children aged 0-14 was 4.7/100,000 population, almost sixteen times the rate recorded in Sweden when they discontinued BCG.

In summary Ireland does not yet meet the criteria of the International Union Against Tuberculosis and Lung Disease for discontinuation of BCG vaccination programmes.¹²

NTBSS 2000

The National Disease Surveillance Centre (NDSC), in consultation with the Health Boards and the National Working group on TB established an enhanced TB surveillance system in Ireland based on a European minimum data-set¹³ that became operational in all health boards January 1st 2000.

NTBSS 2000 is a regional rather than a community care area (CCA) based system with one person in each Health Board responsible for collating TB data either on the epi-info TB database or on paper, maintaining/co-ordinating the quality of data and “data cleaning”. He or she then sends a quarterly report to NDSC (not greater than 2 weeks after end of each quarter) which contains all new cases and follow-up information on cases already on the database.

NDSC analyses the quarterly data from each Health Board and quarterly and annually to the regions, the National TB Advisory Group and the Department of Health and Children. Four quarterly reports have been produced for 2000 with a provisional total of 403 TB cases notified for 2000. It is hoped that follow-up data on these cases will be continually added to during the first six months of 2001 thereby allowing the production of the 2000 National TB Report by Autumn 2001.

Conclusions

- There was a 10.2% increase in TB case notifications in 1999
- There was regional variation in the age standardised TB case notification rate from 7.1/100,000 population in the MHB to 17.9/100,000 population in the MWHB
- The MWHB and the WHB had the highest rates of TB in 1999
- 55.4% of 1999 TB case notifications were culture positive
- 38% of 1999 TB case notifications were sputum smear positive
- 13.8% of 1999 TB case notifications were born outside Ireland
- Pulmonary TB accounted for 65.2% of all TB case notifications in 1999
- There were 2 MDR-TB cases notified and treated in 1999
- Recorded treatment outcome data on TB case notification forms is limited

Recorded follow-up microbiological data on TB case notification forms is limited which could be improved with the establishment of a National TB Reference Laboratory

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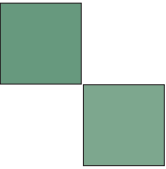


Table 6.

1999 Age standardised TB incidence rate/100,000 and 95% CI			
Health Board	TB cases	Age standardised incidence rate	95% CI
ERHA	180	14.1	12-16.2
MHB	15	7.1	3.5-10.7
MWHB	54	17.1	12.5-21.7
NEHB	25	8.3	5.1-11.6
NWHB	19	8.4	4.6-12.2
SEHB	31	7.8	5.0-10.5
SHB	75	13.4	10.4-16.5
WHB	70	17.9	13.6-22.3
Ireland	469	12.9	11.8-14.1
*Age missing on 5 cases			

Table 8.

Age specific incidence rates per 100,000 in 1999.				
Age group	Male	Female	Ireland	95% CI (Ireland)
0-4	10.1	6.6	8.4	4.8-12.0
5-14	3.5	3.4	3.5	2.0-4.9
15-24	9.3	8.4	8.9	6.5-11.2
25-34	16.7	12.2	14.4	11.2-17.7
35-44	15.4	5.2	10.3	7.5-13.1
45-54	18.7	9.3	14.1	10.5-17.7
55-64	28.0	15.1	21.6	16.3-26.9
65+	36.7	22.8	28.8	23.6-33.9
Total	15.8	10.1	12.9	11.8-14.1
Age data missing on 5 cases				

Table 15a.

1999 Notification rates/100,000 of definite cases of TB.				
Health Board	Culture +ve	% Health Board cases	Rate/100,000	95% CI
ERHA	118	65.5%	9.1	7.5-10.7
MHB	10	66.7%	4.9	1.9-7.9
MWHB	19	35.2%	6	3.3-8.7
NEHB	17	68.0%	5.6	2.9-8.2
NWHB	9	47.4%	4.3	1.5-7.1
SEHB	17	54.8%	4.3	2.3-6.4
SHB	44	58.6%	8.1	5.7-10.4
WHB	26	37.1%	7.4	4.5-10.2
Ireland	260	55.4%	7.2	6.3-8.0

Table 15b.**1999 Notification rates/100,000 of definite cases of TB. (Indigenous population)**

Health Board	Culture +ve	Rate/100,000	95% CI
ERHA	89	6.9	5.5-8.3
MHB	10	4.9	1.9-8.0
MWHB	19	6.0	3.3-8.8
NEHB	13	4.3	2.0-6.6
NWHB	8	3.8	1.2-6.5
SEHB	15	3.9	1.9-5.8
SHB	42	7.8	5.4-10.1
WHB	24	6.9	4.2-9.7
Ireland	220	6.1	5.3-6.9

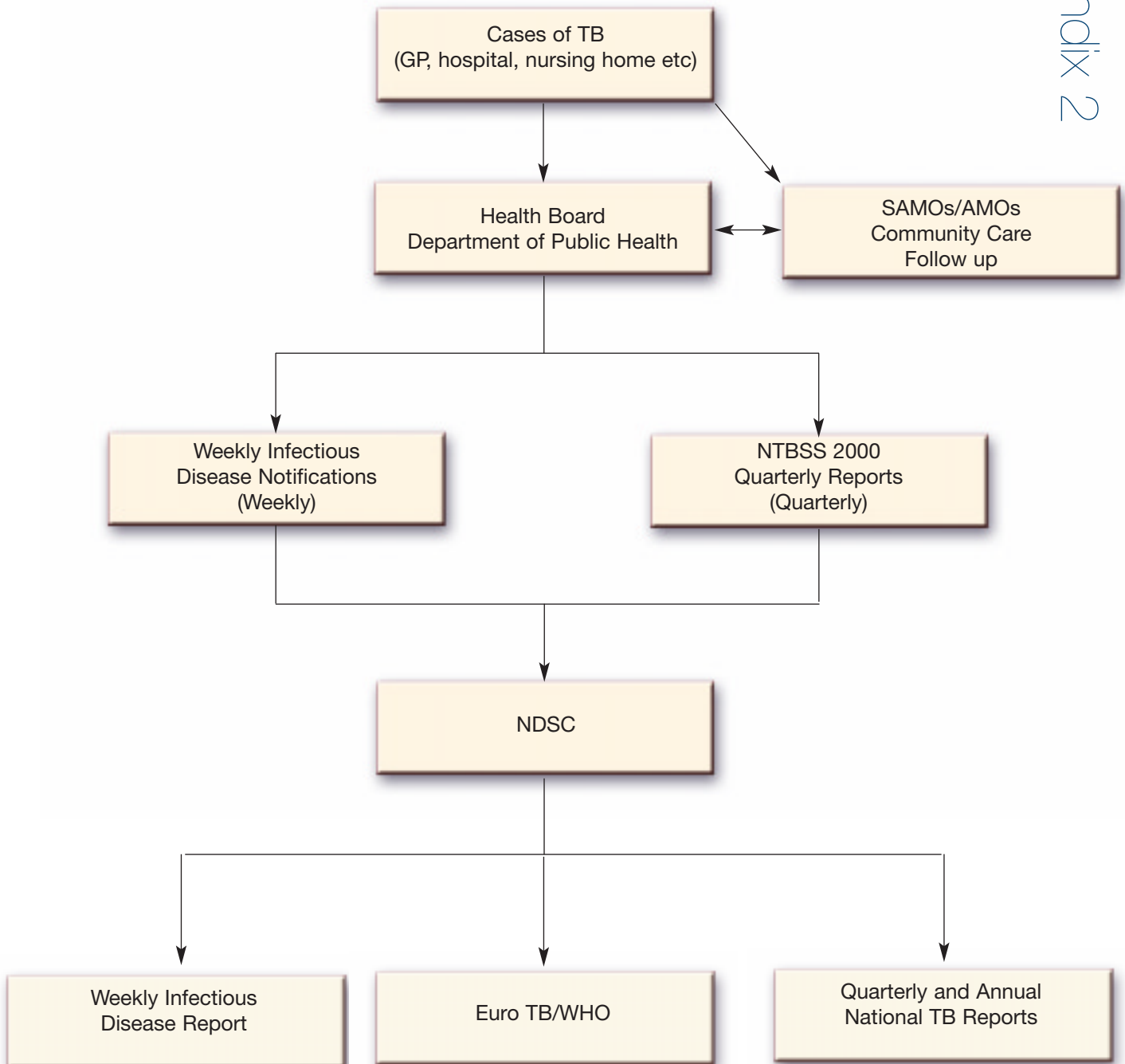
Table 16a.**Rate/100,000 of sputum smear positive pulmonary cases.**

Health Board	Sputum +ve	% Health Board cases	Rate/100,000	95% CI
ERHA	50	37.0%	3.9	2.8-4.9
MHB	10	66.0%	4.9	1.9-7.9
MWHB	10	37.0%	3.2	1.2-5.1
NEHB	6	35.3%	2.0	0.4-3.5
NWHB	6	46.2%	2.9	0.6-5.1
SEHB	7	29.2%	1.8	0.4-3.1
SHB	21	44.7%	3.8	2.2-5.5
WHB	14	20.0%	4.0	1.9-6.1
Ireland	124	37.8%	3.4	2.8-4.0

Table 16b.**Rates/100,000 of sputum smear positive pulmonary cases. (Indigenous population)**

Health Board	Sputum +ve	Rate/100,000	95% CI
ERHA	40	3.1	2.1-4.1
MHB	10	4.9	1.9-8.0
MWHB	11	3.5	1.4-5.6
NEHB	5	1.6	0.2-3.1
NWHB	6	2.9	0.5-5.2
SEHB	5	1.3	0.1-2.4
SHB	22	4.1	2.4-5.8
WHB	14	4.0	1.9-6.2
Ireland	113	3.1	2.6-3.7

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 National TB Reports.

