



# **Report on the epidemiology of Tuberculosis in the Eastern Health Board region in 1998**

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## **Acknowledgements**

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## Introduction

This document presents the epidemiological data for cases of tuberculosis (TB) notified to the Eastern Health Board in 1998. Sources of notification used in this report included hospital physicians, general practitioners, and the Eastern Health Board laboratory surveillance system. Notification forms were completed by public health doctors at community care area level and collated in the Department of Public Health.

## Materials and methods

### **Case definitions**

A notified case of TB referred to clinically active disease due to infection with organisms of the Mycobacterium Tuberculosis complex (M. Tuberculosis, M Bovis and M Africanum). Active disease was presumed if the patient was commenced on a full curative course of antituberculosis chemotherapy.

Persons placed on chemoprophylaxis for preventative treatment or infected by mycobacterium other than the M tuberculosis complex were not included as cases.

**Pulmonary TB** was defined as a laboratory confirmed case (positive smear, histology, or culture) with or without radiological abnormalities consistent with active pulmonary TB.

**Presumed pulmonary TB** was defined as a case treated for TB by the physician without laboratory confirmation.

**Pulmonary TB** was further divided into smear positive and smear negative cases based on direct microscopic examination of spontaneously produced or induced sputum. Cases which were positive on microscopy of bronchoalveolar or gastric lavage were considered laboratory confirmed but sputum smear negative

**Extrapulmonary TB** was defined as a patient with a smear, culture or histology specimen from an extra pulmonary site positive for M tuberculosis complex, or with clinical signs of active extrapulmonary disease and the attending physician treating the patient with a full curative course of antituberculosis chemotherapy.

**Primary TB** was defined as a patient with negative smear, culture or histology specimen but with radiological signs of hilar lymphadenopathy on chest X-ray, positive skin test or clinical evidence leading the physician to treat with a curative course of antituberculosis chemotherapy.

### **Data Analysis**

Population data were taken from the 1991 and 1996 Census of population from the Eastern Health Board area. Data were analysed using Epi Info software version 6.04.  $\chi^2$  test was used to compare proportions in groups and 95% confidence intervals were used to compare rates between groups of interest.  $\chi^2$  for trend was used to assess rates over time. Three year moving average was calculated by applying the formula  $(a+2b+c)/4$  to each three successive points a, b, and c in the series and using the result as the smoothed value of b.

## Results

### **Demography.**

One hundred and fifty four cases were notified as been treated for TB in 1998. The notification rate was 11.96/100,000 population, which was 20% higher than in 1997 (9.9 per 100,000). The decline in notifications of TB seen up to 1996 has halted with a rise in the 3 year moving average now evident.

**Table 1 Notified cases of tuberculosis EHB 1990-1998.**

Year	Number*	Number per 100,000	3 year moving average
1990	191	15.3	
1991	183	14.7	190
1992	202	16.2	183
1993	144	11.6	162
1994	159	12.8	153
1995	150	12.0	143
1996	113	8.7	126
1997	129	9.9	131
1998	154	11.9	

\* $\chi^2$  ( linear trend ) = 26.4 p=0.00000004

Notification of TB was lowest in the first quarter of the year.

**Table 2 Number of Notifications of TB in each quarter, 1998.**

1998	No Cases Notified	Percentage
January-March	29	19.4
April - June	41	26.5
July- September	45	29.0
October- December	39	25.2

Crude rates per 100,000 in each community care area fluctuate each year as is seen in Table 3. In 1998, the highest crude rate was seen in Community Care Area 7 (22.8 per 100,000), followed by Community Care Areas 6 and 5. CCA 7, which covers the north inner city area, is an area of poverty, unemployment and drug abuse.

Table 3. Crude rate per 100,000 for notified cases of TB by Community Care Area (CCA), Eastern Health Board 1990-1998.

Year	1998	1997	1996	1995	1994	1993	1992	1991	1990
CCA 1	6.3	11.0	2.4	12.7	7.2	7.2	8.8	6.4	8.1
2	11.6	5.4	10.1	8.4	16.0	13.5	19.4	13.5	15.7
3	9.7	17.2	10.1	22.4	21.3	10.1	12.4	18.0	23.1
4	11.9	5.6	11.7	6.2	8.9	9.0	15.2	19.3	15.5
5	16	8.0	17.0	22.7	27.4	16.1	11.4	14.2	13.6
6	18.4	14.1	8.1	13.9	12.5	17.6	22.8	22.7	15.3
7	22.8	15.2	13.0	13.8	13.8	19.9	16.5	24.2	20.0
8	9.3	7.8	7.4	8.5	11.1	10.1	22.8	6.9	14.4
9	8.1	8.9	7.3	10.6	5.7	7.3	18.8	17.1	23.2
10	5.7	9.7	5.1	7.2	9.3	5.1	6.2	7.2	7.4

Sixty (39%) cases were female and ninety-four (61%) cases were male. Notification rates increased with age and were higher in men than in women. Rates in males over 35 years old were consistently higher than rates in females.

Table 5 Age and sex specific rates (per 100,000) for notified cases of TB (n=152)

Age group	Female		Male	
	No cases	Rate per 100,000	No cases	Rate per 100,000
0-4	4	9.2	4	8.5
5-14	2	2.1	2	1.9
15-24	10	8.3	11	9.2
25-34	11	10.0	14	13.8
35-44	3	3.2	17	19.5
45-54	4	5.4	12	16.9
55-64	7	13.3	11	22.7
65+	19	25.0	23	46.7

Data on age missing in 2 cases

One hundred and forty two people lived at home, five in institutions and seven in hostel accommodation. Three of the five people living in institutions were in long stay hospital accommodation, the other two individuals were members of a religious order. Five of the seven individuals living in hostels were non-nationals.

#### Risk categories

##### Age

As shown in Table 5 42 patients (28.3%) were 65 years of age or older.

### Employment status

Details were available on employment status on 128 individuals. Forty-two were employed and twenty-eight had retired. In those under 65 years old 33 patients (35%) were unemployed.

### HIV infection

Two patients had HIV associated TB. Both had pulmonary TB, one was sputum positive and one was culture positive. In both cases the organism was fully sensitive to standard TB chemotherapy

### Prior History of TB

Sixteen patients (10.4%) had had TB previously one of whom had had TB within the previous 2 years. Information that an adequate course of treatment had been completed was recorded in 5 patients.

### TB Contact

Thirty-nine patients (25.3%) had a history of contact with TB previously, ten of whom had contact with TB in the previous 2 years. Only one of the ten cases was found by contact tracing. In one case the patient had defaulted from the screening procedure.

### Ethnicity

Details of the country of origin were available in 151. One hundred and twenty seven cases (84%) were Irish. Twenty-four (16%) were of foreign nationality reflecting an increase in notifications in non-nationals of 100% on 1997 figures (Twelve cases notified in non-nationals).

**Table 6 Country of Origin of TB cases in non -nationals**

<b>Country Of Origin</b>	<b>Number cases</b>
Australia	1
Congo	1
England	1
Hong Kong	1
India	3
Liberia	1
Libya	1
Malaysia	1
Nigeria	2
Romania	2
Scotland	2
Somalia	2
South Africa	1
Spain	1
Vietnam	2
Zaire	2

Sixteen (66%) of these patients came from "high -risk" countries as defined by W.H.O. (incidence of TB  $\geq$  40/100,000 population).

**BCG Vaccination.**

Of the 102 patients where information on BCG vaccination status was available, 52 patients gave a history of prior BCG vaccination and 44 of these (43.1% of total) had BCG scars. Fifty patients did not have BCG. Data was not available on the remainder.

**Diagnosis**

One hundred and twenty three (80%) cases were diagnosed with pulmonary or combined pulmonary and extrapulmonary TB, of whom 87 (70.7%) were laboratory confirmed, (tables 7 and 8). Pulmonary TB alone was diagnosed in 111 (72%) cases, of which 79 (71.2%) were laboratory confirmed and 32 (28.8%) were presumed. There were 12 cases of combined pulmonary and extrapulmonary TB, 8 of whom were laboratory confirmed (4 pulmonary sites).

**Table 7. Classification of cases of TB notified to EHB 1998**

<b>Diagnosis</b>	<b>No. Cases</b>
Pulmonary TB	111 (72%)
Pulmonary + Extrapulmonary	12 (8%)
Extrapulmonary	29 (19%)
Primary	2 (1%)
<b>Total</b>	<b>154 (100%)</b>

**Table 8. Sputum smear and culture status for notified pulmonary TB cases and notified extrapulmonary cases associated with pulmonary disease (in brackets), EHB 1998.**

<b>Pulmonary TB</b>	<b>Sputum smear</b>			<b>Total</b>
	<b>Positive</b>	<b>Negative</b>	<b>Not done</b>	
<b>Culture +</b>	51 (2)	25 (5)	3 (1)	79 (8)
<b>Culture -</b>	0 (0)	31 (3)	1 (1)	32 (4)
	51(2)	56 (8)	4 (2)	111 (12)

Extra pulmonary TB alone was notified in 29 cases. The sites involved in extrapulmonary TB were as shown in table 9.

**Table 9: Extrapulmonary disease sites (includes cases with combined pulmonary and extrapulmonary disease.**

Site	Number Cases
Pleural	8
Lymph-Extrathoracic	9
Spinal	1
Bone	5
Meningeal	2
Genitourinary	4
Disseminated	3
Peritoneal	2
Skin	2
Ear	1
Vocal cords	1
Tonsils	1
Endometrium	1

Extrapulmonary TB was culture positive in 20 cases and histology was positive in 3 additional cases.

**Table 10. Histology and culture status of extrapulmonary cases of TB, EHB 1998.**

Extrapulmonary TB	Culture		Total
	Positive	Negative	
Histology +	4	3	7
Histology -	16	6	
	20	9	29

*Histology- means histology negative or not done*

Two cases of TB meningitis were notified –one in a one year old child who had not received BCG vaccination. She also had evidence of pulmonary disease on chest x-ray but was sputum ZN stain and culture negative. The second case occurred in a 38-year-old man who had received neonatal BCG.

Primary TB was diagnosed in two patients

**Table 11. Diagnosis for notified cases of TB, EHB 1991-1998**

Year	1998	1997	1996	1995	1994	1993	1992	1991
Pulmonary TB only (lab confirmed)	79	66	66	76	83	68	95	100
Presumed Pulmonary TB	32	31	16	39	45	45	61	51
Extrapulmonary TB only	29	25	22	24	21	20	31	21
Pulmonary + extrapulmonary TB (Pulmonary disease lab confirmed)	12 4	6 5	6 na	7 na	7 na	10 na	5 na	3 na
Primary TB	2	1	3	4	3	1	10	8
Total	154	129	113	150	159	144	202	183

#### Drug Resistance.

Three cases of tuberculosis had an organism resistant to one or more antibiotics. All these cases occurred in non-nationals. These patients came from Nigeria, Vietnam, and the Congo respectively. Two were diagnosed with pulmonary disease and one with extrapulmonary disease (cervical lymph gland). One isolate was both isoniazid and pyrazinamide resistant. One isolate was resistant to streptomycin and one was isoniazid resistant.

#### Deaths

Eleven patients died following the diagnosis of TB. In three cases TB was the cause of death.

Over the last three years the numbers of cases of TB in non- nationals has doubled.

**Table 12: Cases of TB in indigenous population and in non-nationals, EHB, 1996-1998**

Year	Indigenous Irish		Non Nationals	
	Number	Percentage of total cases	Number	Percentage of total cases
1996	103	91.2	10	8.8
1997	117	90.7	12	9.3
1998	130	84.5	24	15.5

The non- national population did not differ from the Irish in sex, sputum status and culture results. However, overall they were younger ( $p=.00435$ ) and were more likely to have extrapulmonary disease ( $p=.0037$ ).

#### Hospitalization

One hundred and fourteen patients (74%) were admitted to hospital either for diagnosis or treatment.

### Notification Source

The main source of notification was the physician. Other sources included general practitioners, laboratory surveillance, public health and family.

**Table 13 : Notification Source of TB cases EHB 1998**

Notification Source	No Cases	Percentage
Clinician	107	70 %
Family	8	5.2 %
General Practitioner	11	7.3%
Laboratory Surveillance	5	3.3%
Public Health	18	11.9%
Other	2	1.3%

Notifications from the Laboratory Surveillance System and family reflect a failure of the Tuberculosis Notification system as the responsibility for notification rests with the physician.

### Delay in Notification

Data on date of diagnosis and date of notification was available on 142 patients. Forty-five patients (29%) were notified on the day of diagnosis. One hundred patients (64.9%) had their disease notified within one week of diagnosis. One patient was notified 134 days following diagnosis.

**Table 14. Delay in Notification of TB cases in EHB 1998**

Days to notification	Number
0-6	100
7-13	19
14-20	9
21-26	4
27-34	1
35-41	2
42-48	1
49-55	1
56-62	1
63-69	1
70 +	3

With 8 cases of sputum positive TB there was a delay in notification of greater than one week. However, all sputum positive cases were notified within 16 days of diagnosis.

## Discussion.

TB surveillance involves the systematic collection, collation, analysis and dissemination of information on the epidemiology of TB to all relevant professionals in the region. Close co-operation between clinicians, microbiologists and public health doctors is essential so that accurate and reliable data is collected and that an accurate picture of the epidemiology of TB is described. TB surveillance also provides invaluable information for planning services for the prevention treatment and control of TB.

There has been a rise in the number of cases of TB notified in 1998. There has been an increase in the number of laboratory confirmed cases notified, with 71.2% of all pulmonary TB cases being laboratory confirmed. This is higher than that reported in 1997 (68%) and higher than most years since 1991, with the exception of 1996.

Risk factors for disease remain unchanged on previous years and include age over 65, being male, unemployment and a history of previous TB or TB contact. HIV associated TB has not proven to be as problematic as originally anticipated in the 1980's. There has been an increase in cases arising in non-nationals. This probably reflects the changing ethnic composition of the population of the region. At present voluntary screening is offered to asylum seekers from high-incidence countries but not all avail of the service currently. There may be many barriers to partaking in screening including language difficulties, low priority given to health issues and a perception that ill health may reflect negatively on decisions being made regarding asylum applications.

There was one case of TB meningitis in a child in 1998. W.H.O. criteria for discontinuing routine BCG vaccination state that a rate of TB meningitis in children under age 5 be less than one case per 10 million general population over the previous 5 years. One case in this age group in the Eastern Health Board gives us a rate above W.H.O. recommendations for discontinuing BCG vaccination.

The 1996 Working Party Document on Tuberculosis recommends that cases of tuberculosis should be notified within three working days following diagnosis and that contact tracing should commence within seven working days following notification. In general there was prompt reporting to public health of cases of TB but in 1998 8 sputum positive cases were not notified within one week of diagnosis.

In 1999 additional information will be collected on each case such as sputum conversion at 2 months and so our understanding of the epidemiology of TB, and specifically the outcome of treatment in the region will continue to improve.

Thank you to those public health doctors physicians, and microbiologists who submitted information that made this report possible.