

Report on the Epidemiology of Tuberculosis in the Eastern Region 2001

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Eastern Regional Health Authority
October 2001**

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Acknowledgements

We would like to thank all those who participated in the collection of information used in the preparation of this report. Thank you to notifying physicians, public health doctors, nurses and microbiologists without whom this report would not have been possible.

We would also like to acknowledge the contribution of Dr. Piaras O Lorcain (Surveillance Scientist), Department of Public Health Medicine, Dr. Steevens Hospital.

Introduction

This document presents the epidemiological data for cases of tuberculosis (TB) notified for Dublin, Wicklow and Kildare in 2001. Sources of notification used in this report included hospital physicians, general practitioners, community pharmacists and the regional laboratory surveillance system. Notification forms were completed by public health doctors at community care level and collated in the Department of Public Health.

Materials and methods

Case definitions

A notified case of TB refers 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 preventive 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.

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 6.04. A three year moving average was calculated by applying the formula $(a+2b+c)/4$ to each of three successive points a, b, and c in the series and using the result as the smoothed value of b.

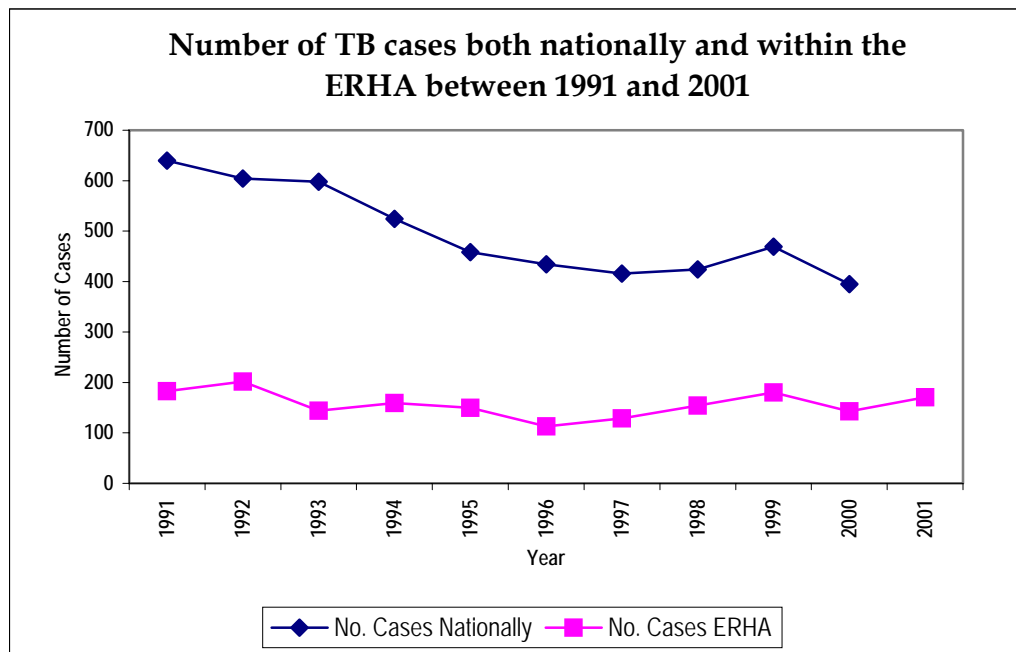
Results

One hundred and seventy one patients were notified as having been treated for TB in 2001. The crude notification rate was 13.2/100,000 population .

Table 1: Notified cases of tuberculosis Eastern Health Board/Eastern Regional Health Authority 1990-2001

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	154
1999	180	13.9	154
2000	143	11.0	164
2001	171	13.2	159

Chart 1: Notified Cases of TB Nationally vs ERHA 1991-2001



Seasonal Distribution

Notification of TB was highest in the first quarter of 2001 (Table 2).

Table 2: Number of Notifications of TB in each quarter, ERHA 2001

2000	No Cases Notified	Percentage
January-March	58	33.9
April – June	33	19.3
July- September	47	27.5
October- December	33	19.3
Total	171	100.0

Distribution of cases by Community Care Areas

Crude notification rates per 100,000 in each community care area fluctuate each year as seen in Table 4. In 2001, the highest crude rate was seen in Community Care Areas (CCA) 3 and 7. These areas are areas of poverty, unemployment, and illicit drug use. Both of these areas are situated in the inner city region. Boundary changes between areas 2 and 3 resulted in a significant increase in notifications in CCA 3 in 2001, where there were 34 TB notifications compared to 10 in 2000. The census data (1996) used in this report does not reflect those boundary changes, thus leading to a higher crude notification rate in CCA3. Community Care Area 6 once again recorded a high rate.

Table 3: No of cases of TB notified for each Community Care Area in ERHA, 2001

CCA	No cases (%)
1	2 (1.2)
2	7 (4.1)
3	34 (19.9)
4	11 (6.4)
5	13 (7.6)
6	29 (17.0)
7	34 (19.9)
8	24 (14.0)
9	9 (5.3)
10	8 (4.7)
Total	171 (100.0)

Table 4: Crude rate per 100,000 for notified cases of TB by Community Care Area, Eastern Health Board/ERHA 1990-2001

Year	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990
CCA												
1	1.5	5.5	8.7	6.3	11.0	2.4	12.7	7.2	7.2	8.8	6.4	8.1
2	5.3	10.9	11.8	11.6	5.4	10.1	8.4	16.0	13.5	19.4	13.5	15.7
3	36.6	10.8	14.6	9.7	17.2	10.1	22.4	21.3	10.1	12.4	18.0	23.1
4	7.7	7.7	15.4	11.9	5.6	11.7	6.2	8.9	9.0	15.2	19.3	15.5
5	11.5	13.3	13.2	16	8.0	17.0	22.7	27.4	16.1	11.4	14.2	13.6
6	20.5	19.1	19.1	18.4	14.1	8.1	13.9	12.5	17.6	22.8	22.7	15.3
7	28.7	19.4	25.1	22.8	15.2	13.0	13.8	13.8	19.9	16.5	24.2	20.0
8	12.4	11.4	10.1	9.3	7.8	7.4	8.5	11.1	10.1	22.8	6.9	14.4
9	6.7	6.6	20.4	8.1	8.9	7.3	10.6	5.7	7.3	18.8	17.1	23.2
10	7.8	4.9	7.2	5.7	9.7	5.1	7.2	9.3	5.1	6.2	7.2	7.4

Sex Distribution

Sixty one (35.7%) cases were female and one hundred and ten (64.3%) were male. There were no cases of TB diagnosed in children under 5 years of age. Notification rates increased with age and were higher in men. Rates in males over 65 years old remain higher than rates in females for this age group.

Table 5: Age and sex specific rates (per 100,000) for notified cases of TB in ERHA, 2001 (n=171)

Age group	Female		Male	
	No cases	Rate per 100,000	No Cases	Rate per 100,000
0-4	0		0	
5-14	3	3.0	1	1.0
15-24	14	11.7	24	22.0
25-34	11	10.0	20	19.7
35-44	7	8.4	18	20.6
45-54	6	8.1	17	23.9
55-64	7	13.3	16	33.0
65+	13	17.1	14	28.4

Accommodation Status

One hundred and fifty four patients lived at home, two in institutions, six in hostel accommodation two in B&B and two were homeless. Five cases were categorised as residing in other accommodation, which was not specified on the surveillance forms.

Risk Categories

1. Age

As shown in Table 5, twenty-seven cases were 65 years of age or older compared to forty two cases in 2000.

2. Employment status

Information was available on 159 cases. Fifty four (34.0%) were employed, 38 (23.9%) were unemployed and 25 (15.7%) had retired. Among those under 65 years of age, 24 (16.7%) were unemployed compared to 27.8% in 2000. Sixteen (10.1%) were classified as housewives, twenty four as students (15.1%)- compared to 9 (6.3%) students in 2000 and two (1.3%) as other, which was not specified.

3. Ethnicity

One hundred and thirty six cases were born in Ireland and 35 (20.5%) were of foreign nationality; this reflects an increase compared to 2000 figures, when 25 patients (17.5% of cases) were notified in non-nationals.

Fifteen (8.8%) were classified as Asylum Seekers/Refugees, similar to 2000 figures. One hundred and forty (82%) were classified as Caucasian, seventeen as Black, five as Chinese, seven as Indian subcontinent and two as others, nationality not specified.

Twenty nine of these patients came from high TB burden countries as defined by the World Health Organisation i.e. TB incidence rate > 40/100,000 population.

The incidence of TB in non-nationals is gradually increasing yearly with an increasing proportion coming from areas of high incidence. The increased rate observed in 1999 was contributed to by on site screening of Kosovian refugees admitted to Ireland under a Government programme; see table 6.

Table 6: Cases of TB in indigenous population and in non-nationals, EHB/ERHA, 1996-2001

Year	Indigenous Irish		Non Nationals	
	<i>Number</i>	<i>% of total cases</i>	<i>Number</i>	<i>% of total cases</i>
1996	103	91.2	10	8.8
1997	117	90.7	12	9.3
1998	130	84.5	24	15.5
1999	136	75.5	44	24.4
2000	118	82.5	25	17.5
2001	136	79.5	35	20.5

The non-national population did not differ from the Irish in sex, sputum status, culture results, history of TB in the past and whether the diagnosis was pulmonary or extrapulmonary

4. HIV Infection

Five patients had HIV associated TB compared to six cases in 2000. Four had pulmonary disease and one had peritoneal TB. Mycobacterium tuberculosis was isolated in four cases and there was no culture result available for the fifth case. Only one of the five cases was sputum positive on direct examination, three were negative and no sputum result was available on the fifth. In all cases the organism was fully sensitive to first line TB chemotherapy. Three of the cases occurred in asylum seekers/refugees, and one of these, who was sputum positive, was resistant to streptomycin.

5. Prior History of TB

There was a small decrease in the proportion of patients notified in 2001, with a history of TB in the past, (n=18, 10.5%) compared to 2000 (n=23, 16.2%). Five of these patients had a history of TB within the previous five years. One of these patients defaulted from therapy, one was an IVDU and HIV positive, one was an intravenous drug user (IVDU), four had alcohol documented as a risk factor and three patients were recorded as asylum seekers/refugees .

Case Finding

One hundred and twenty one (74.7%) presented as cases, 24 (4.0%) were found by contact tracing, one case (0.6%) by screening of asylum seekers/refugees, three (2.1%) by other screening methods , 2 (1.2%) by other methods not specified and 9 cases (5.3%) were not recorded.

Diagnosis

One hundred and twenty nine cases were diagnosed with pulmonary or combined pulmonary and extra-pulmonary TB. Pulmonary TB alone was diagnosed in 114. There were fifteen cases of combined pulmonary and extra-pulmonary TB.

Table 7: Classification of cases of TB notified to the ERHA in 2001

Diagnosis	No. Cases (%)
Pulmonary TB	114 (67.1)
Pulmonary + Extrapulmonary	15 (8.8)
Primary	1(0.6)
Extrapulmonary	41 (24.1)
Total	171 (100)

Table 8: Sputum smear and culture status for notified pulmonary TB cases and notified extrapulmonary cases associated with pulmonary disease (in brackets) in the ERHA, 2001

Sputum smear			
Pulmonary TB	Positive	Negative	Not done
Culture +	54 (4)	29 (4)	2 (1)
Culture -	0 (0)	21 (4)	2 (0)
Not done	0 (0)	0 (0)	2 (1)
Total	54 (4)	50 (8)	6 (2)

Table 9: Histology and culture status of extrapulmonary cases of TB in the ERHA in 2001

Extrapulmonary TB	Culture		
	Positive	Negative	Total
Histology +	7	6	13
Histology -	14	14	28
	21	20	41

Histology– means histology negative or not done

Culture negative means culture negative or not done

Extra-pulmonary TB alone was notified in 41 cases. The sites involved were as shown in table 10.

Table10: Extrapulmonary disease sites in the ERHA (includes cases with combined pulmonary and extrapulmonary disease) in 2001

Site	Number Cases
Pleural	26
Lymph-Extrathoracic	8
Lymph intrathoracic	1
Disseminated	3
Peritoneal	4
Spinal	5
Eyes	1
Bone/Joint	1
Genitourinary	4
Pericardial	1
Skin	1
Colon	1

Drug Resistance

Eight cases of tuberculosis had an organism resistant to one or more antibiotics, compared to only two cases in 2000; five of the eight occurred in non-nationals. Mono-resistance to isoniazid was recorded in 3 cases, mono-resistance to streptomycin in one case and the other four patients were resistant to two or more antibiotics. Case 3 had a history of inadequately treated TB in 2000. The details are outlined in Table 11 below

Table 11: Sensitivity results of resistant isolates in ERHA 2001.

	Isolate	Isoniazid	Ethambutol	Rifampicin	Pyrazinamide	Streptomycin
Case 1	M.TB	+				
Case 2	M. TB	+				+
Case 3	M. TB	+	+	+		
Case 4	M. TB					+
Case 5	M. TB	+				+
Case 6	M. TB	+				
Case 7	M. TB	+			+	
Case 8	M.TB	+				

Outcomes

Eight patients (4.7%) died following the diagnosis of TB. TB was considered to be the cause of death in three of the cases. Six patients (3.5%) including three smear positive cases and one case in an asylum seeker/refugee were lost to follow up. Three patients (1.8%) were categorised as having their treatment interrupted for greater than two months, one of whom was direct smear positive. Twenty-one patients (12.3%) had an unknown outcome, three of whom were direct smear positive, four of whom were classified as asylum

seekers/refugees, two as IVDUs, four as having excess alcohol intake and one having immunosuppressive therapy documented as a risk factor.

Delay in Notification

Data on the date of diagnosis was available for 169 patients, while data on date of notification was available for all 171 patients. The 1996 Working Party Document on Tuberculosis² recommends that cases of tuberculosis should be notified within three working days of diagnosis and that contact tracing should commence within seven working days of notification.

The mean number of days from diagnosis to notification for all cases was 15 days in 2001. For smear positive cases this figure was 7.3 days. In 2001 only 60% of cases were notified to the Health Board within seven working days (60% also in 2000). Data on the time interval between notification and initiation of contact tracing is not routinely collected.

Table 12: Delay in Notification of TB cases in the ERHA, 2001

Days to notification	Number
0 - 6	99
7 - 13	20
14 -20	15
21 - 26	9
27 - 34	7
35 -41	4
42 - 48	6
49 - 55	2
56 - 62	0
63 - 69	1
70 +	6
Total	169

Contact Tracing

Contact tracing constitutes a large workload for medical and public health nursing staff who work in the community care areas.

Public Health doctors provide a screening service for TB at three hospital clinics attached to TB/Respiratory units in Dublin, namely, the Mater Hospital (NAHB), St. Vincent's Hospital (ECAHB) and St. James's Hospital (SWAHB). Advice is available, at these clinics, from a Respiratory Physician with a special interest in TB. A service is also provided locally in Kildare and Wicklow.

Screening also takes place on-site, when a case of smear positive pulmonary TB occurs in a school, a workplace or an institution.

Screening of healthcare workers exposed to a case of smear positive TB in the workplace continues to generate a large workload in some areas. Guidelines for contact tracing in this occupational group differ between public health and occupational health physicians. Clarification of the respective roles of both groups in the contact tracing of healthcare staff is needed.

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. An enhanced TB surveillance system (NTBSS) based on a European minimum data set was introduced in the Region in 1999 in consultation with the Health Boards, the National Disease Surveillance Centre (NDSC) and the National Working Group on TB and is fully operational since January, 2000. Quarterly returns are forwarded to the NDSC and are analysed, reported and disseminated to all regions in the country. It is hoped that this enhanced TB Surveillance System will provide better quality information for the planning, provision and evaluation of services for the prevention, control and treatment of TB. 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 in the Eastern Region is described.

There was an increase in the number of cases of TB notified in the ERHA region in 2001 compared to 2000. One hundred and seventy one of TB were notified in 2001 (Crude notification rate of 13.2/100,000), compared to one hundred and forty three cases in 2000 (Crude notification rate of 11.0/100,000).

Risk factors for TB remain unchanged compared to previous years and include age over 65, being male, unemployed and having a previous history of TB. Eighteen (10.5%) of the cases had a previous history of TB.

As in previous reports, HIV associated TB has not proven to be as problematic as originally anticipated in the 1980's. There were only five cases of HIV associated TB reported in 2001.

There has again been a steady increase in the number of notified TB cases in non-nationals in 2001. Thirty five cases (20.5%) were of foreign nationality compared to 25 (17.5) cases in 2000. Twenty- nine of these patients came from countries with a high burden of TB as defined by the World Health Organisation, ie TB incidence > 40/100,000 population. Fifteen, (43%) of non-nationals were classified as asylum seekers/refugees in 2001. It is notable that in 1999, 11 (25%) out of the 44 cases involved "programme" refugees from Kosova. This explains the inflated figures for non-nationals in 1999.

At present voluntary screening for TB is offered to asylum seekers from high-incidence countries in three Refugee Reception Centres in the region, but not all avail of the service. There may be 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. Further research into the low uptake of voluntary screening among refugee/asylum seekers is needed. .

The Working Party Document in TB (1996) recommended that cases of tuberculosis should be notified within three working days of diagnosis and that contact tracing should commence within seven working days of notification². In 2001, only 60% of notifications occurred within the time period recommended by the working party. The mean number of days from diagnosis to notification in 2001 was sixteen. Reassuringly, the mean delay from diagnosis to notification in the fifty-four sputum direct smear positive cases was 7.3 days. These figures are comparable to 2000 figures indicating no improvement in notification systems in 2001.

Drug resistance may be an emerging problem. Eight cases of tuberculosis had an organism resistant to one or more antibiotics compared to only two cases in 2000; five of the eight cases occurred in non-nationals. Four of the eight cases were resistant to more than one antibiotic with one resistant to three. Multi drug resistance as defined by resistance to at least isoniazid and rifampicin with or without resistance to ethambutol and streptomycin; this was noted in one patient in 2001.

Another trend observed in 2001 was the high incidence of TB amongst the student population with 24 (15.1%) cases notified compared to 9(6.3%) cases in 2000. Screening within the school setting contributed a significant burden on local contact tracing services. However 10 of the 24 cases in students were found by contact tracing .

References:

1. Report on the Epidemiology of Tuberculosis in the Eastern Health Board Region in 2000. Department of Public Health, Eastern Health Board.
2. Report of the Working Party on Tuberculosis. Department of Health, September 1996.