Report on the Epidemiology of Tuberculosis in the Eastern Region 2002

Department of Public Health
Eastern Regional Health Authority
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Dr. Mary Scully
Specialist in Public Health Medicine
Eastern Regional Health Authority

Dr. Peter Nolan
Area Medical Officer
Community Care Area 6
Northern Area Health Board

Dr Mary O Meara
Senior Area Medical Officer
Community Care Area 8
Northern Area Health Board

On behalf of the ERHA TB committee: **Dr Rosalea Watters (Chair),** Dr Pauline Morris, Dr Pasqueline Lyng, Dr.Aileen Reddin, Dr Fionnuala Donohue, Dr Deirdre Somers, Dr. Brenda O Sullivan Dr Grainne Egan, Dr Sylvia Eakins

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Introduction

This document presents the epidemiological data for cases of tuberculosis (TB) notified for Dublin, Wicklow and Kildare in 2002. 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. The delay in the publication of this 2002 report is partly due to the lengthy industrial dispute by public health doctors in 2003.

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 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, culture or positive PCR result) 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.

Extra-pulmonary 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 2002 Census of Population for the Eastern Regional Health Authority area, (Northern Area Health Board, South Western Area Health Board and East Coast Area Health Boards). Data was analysed using Epi-Info 2000. 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 sixty three Tuberculosis cases were notified in 2002 to the Department of Public Health and the Community Care areas in the Eastern Regional Health Authority Region. The crude notification rate was 11.6/100,000 population, which was lower than in 2001, when 171 cases were notified (12.2 per 100,000). The increase in the 3 year moving average, evident each year since 1997 has continued apart from a dip evident in 2001.

Table 1: Notified cases of tuberculosis Eastern Health Board/Eastern Regional Health Authority 1990-2002

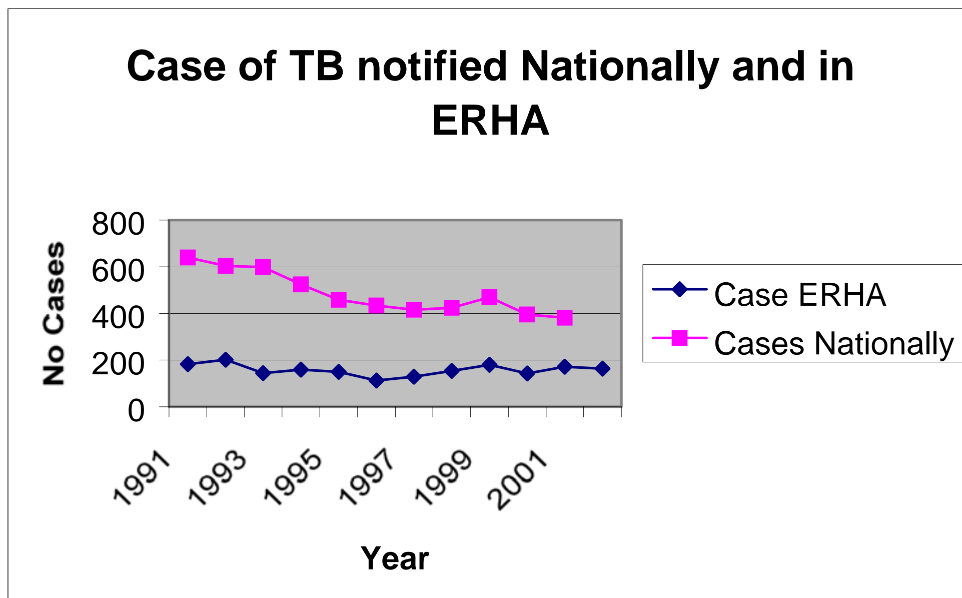
Year	Number*	Number per 100,000	3 year moving average
1990	191	15.3	
1991	183	14.7	190
1992	202	16.2	183
1993	144	11.6	162
1994	159	12.8	153
1995	150	12.0	143
1996	113	8.7	126
1997	129	9.9	131
1998	154	11.9	154
1999	180	13.9	154
2000	143	11.0	164
2001	171	12.2	159
2002	163	11.6	162

The National Disease Surveillance Centre (NDSC) collates national statistics on Infectious Disease. In 2001, 381cases cases of TB were reported to the NDSC, giving a crude incidence rate of 9.2/ 100,000. Whilst the numbers of cases recorded nationally are decreasing each year, this decrease is not reflected in the ERHA region

Table 2 Cases of TB recorded Nationally and in ERHA 1991-2002

Year	National TB Notifications	ERHA TB notifications
1991	640	183
1992	604	202
1993	598	144
1994	524	159
1995	458	150
1996	434	113
1997	416	129
1998	424	154
1999	469	180
2000	395	143
2001	381	171
2002		163

Chart 1: Cases of TB notified nationally and in ERHA



Distribution of cases by Community Care Area in 2002.

The number of cases and the crude notification rates per 100,000 in each community care area fluctuate each year as seen in Table 3, 4 & 5. In 2002, the highest crude rate was seen in Community Care Area 6 (23.7 per 100,000) and area 3 (21.5 per 100,000), followed by CCAs 7 (18.8 per 100,000) and area 5 (18.3 per 100,000) respectively. These Community Care Areas, which cover the north and south inner city areas and West Dublin, are areas of poverty, unemployment, social disadvantage and high rates of illicit drug use.

Table 3: No of cases of TB notified for each Health Board Area in ERHA, 2002.

Area Health Board	No Cases (%)
NAHB	72 (44.2%)
SWAHB	76 (46.6%)
ECAHB	15 (9.2%)
Total	163

Table 4: No of cases of TB notified for each Community Care Area in ERHA, 2002

CCA	No cases (%)
1	6 (3.7%)
2	8 (4.9%)
3	28 (17.2%)
4	11 (6.7%)
5	23 (14.1%)
6	38 (23.3%)
7	23 (14.1%)
8	11 (6.7%)
9	14 (8.6%)
10	1 (0.6%)
Total	**163 (100%)**

Table 5: Crude rate per 100,000 for notified cases of TB by Community Care Area, Eastern Health Board/ERHA 1990-2002

Year	2002	2001	2000	1999	1998	'97	1996	1995	1994	1993	1992	1991	1990
CCA													
1	4.7	1.6	5.5	8.7	6.3	11.0	2.4	12.7	7.2	7.2	8.8	6.4	8.1
2	7.6	6.7	10.9	11.8	11.6	5.4	10.1	8.4	16.0	13.5	19.4	13.5	15.7
3	21.5	26.1	10.8	14.6	9.7	17.2	10.1	22.4	21.3	10.1	12.4	18.0	23.1
4	7.5	7.5	7.7	15.4	11.9	5.6	11.7	6.2	8.9	9.0	15.2	19.3	15.5
5	18.3	10.2	13.3	13.2	16	8.0	17.0	22.7	27.4	16.1	11.4	14.2	13.6
6	23.7	18.1	19.1	19.1	18.4	14.1	8.1	13.9	12.5	17.6	22.8	22.7	15.3
7	18.8	27.8	19.4	25.1	22.8	15.2	13.0	13.8	13.8	19.9	16.5	24.2	20.0
8	5.4	11.8	11.4	10.1	9.3	7.8	7.4	8.5	11.1	10.1	22.8	6.9	14.4
9	7.8	5.0	6.6	20.4	8.1	8.9	7.3	10.6	5.7	7.3	18.8	17.1	23.2
10	1.0	8.0	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-three cases, (38.7%) were female and one hundred cases (61.3%) were male. 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. In 2002 there was a high rate of notified TB in males in the 25-44 year age group. (Forty six cases, 10.1 per100, 000)

Table 6: Age specific rates (per 100,000) for notified cases of TB in ERHA, 2002 (n= 163)

	Female		Male	
Age group	**No cases**	**Rate per 100,000**	**No Cases**	**Rate per 100,000**
0-4	0	0	0	0
5-14	2	1.1	1	0.55
15-24	11	4.5	12	4.9
25-44	25	5.5	46	10.1
45-64	10	3.5	22	7.2
65+	15	11.0	19	13.9

Accommodation Status

One hundred and forty five people lived at home, three in institutions, seven in hostel accommodation, three in B&B/Hotel and three were classified as homeless. Two cases occurred in inmates of a prison in Dublin.

Risk Categories

1. Age

As shown in Table 5, thirty-four cases (20.1%) were 65 years of age or older. In 2002 seventy one cases (43.5%) occurred in the 25-44 year old age group, especially in males – 46 cases (28%).

2. Employment status

Forty-seven (29%) were employed, forty three (26%) were unemployed and thirty (18%) had retired. Twenty (12%) were classified as housewives/husbands, ten (6%) as students and 13 (8%) as other and unclassified.

3. Ethnicity

One hundred and four cases (64%) were born in Ireland and 59 (36%) were of foreign nationality, reflecting an increase in notifications in non-nationals compared to the 2001 figures, when 35 cases (20%) were notified in non-nationals. Twenty-three of the non-nationals (14%) were classified as Asylum Seekers/Refugees. Eighteen of the non-nationals (30%) were classified as Caucasian, twenty six as Black (44%), three as Chinese (5%), eleven as Indian subcontinent (19%.) and one (1.7%) as other, nationality not specified.

Twenty of these patients came from among the 22 high TB burden countries as defined by the World Health Organisation (WHO).

In 1999, the number of cases of TB in non-nationals had increased by more than three-fold (24.4%cases) compared to previous years. This figure had only increased by two-fold in 2000 (17.5% cases). In 2001 the number of cases of TB in non-nationals had again increased to 20.5% of cases. The upward trend in the notification of TB in non-nationals evident since 1997 has continued to increase significantly in 2002.

Table 7: Cases of TB in indigenous population and in non-nationals, EHB/ERHA, 1996-2002

Year	**Indigenous Irish**		**Non Nationals**	
	Number	*% of total cases*	*Number*	*% of total cases*
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
2002	104	64.0	59	36.0

4. HIV Infection

Fourteen patients (8.6%) had HIV associated TB compared to five cases (2.9%) in 2001. Eight had pulmonary disease, four had pulmonary and extra-pulmonary disease and two had extra-pulmonary disease. Mycobacterium tuberculosis was isolated in eight cases, five cases were culture negative and there was no culture result available for the fourteenth case. Four of the fourteen cases were sputum positive on direct examination, six were smear negative and no sputum result was available in the other four cases. One case showed resistance to isoniazid, and in all the other cases the organism was fully sensitive to first line TB chemotherapy.

Five of the cases occurred in Irish nationals and nine occurred in non-nationals from, sub-Saharan Africa, the Indian subcontinent and South East Asia. Four of the cases occurred in refugee/asylum seekers. Eleven of these cases presented as cases, while three were identified by contact tracing. Nine of the patients completed a full course of anti-tuberculous chemotherapy, one of the cases defaulted from treatment for greater than 2 months, one of the patients was lost to follow up (ZN positive case), and two of the patients died (although TB was not documented as the cause of death in these cases).

5. Prior History of TB.

Only nine patients (5.5% cases) had a documented past history of tuberculosis. Seven of these cases were smear and culture positive for Mycobacterium tuberculosis and all isolates were fully sensitive to first line agents. Six of these cases were in Irish nationals and three of them in non-Irish nationals, two of whom were asylum seeker/refugees.

Case Finding

One hundred and thirty six cases (83%) presented as cases, twelve cases (7.0%) were found by contact tracing, two cases (1.2%) by screening of asylum seekers/refugees, three cases were post-mortem diagnoses three cases (1.8%) by pre-operative assessment prior to surgery, one case (0.9%) post operatively, while another case presented as an acute case of confusion in an elderly person. The other six cases had "other" unspecified cause as their method of presenting as cases.

Diagnosis

One hundred and fifteen cases were diagnosed with pulmonary or combined pulmonary and extra-pulmonary TB, of whom 88 (76.5%) were laboratory confirmed (tables 8 and 9). Pulmonary TB alone was diagnosed in 107 cases, of whom 82 (76.6%) were laboratory confirmed. There were eight cases of combined pulmonary and extra-pulmonary TB, of whom six (75%) were laboratory confirmed. One patient was diagnosed with M. Bovis infection on culture-the organism was pyranizamide resistant.

Table 8: Classification of cases of TB notified to the ERHA in 2002

Diagnosis	No. Cases (%)
Pulmonary TB	110 (67.5%)
Pulmonary + Extrapulmonary	17 (10.4%)
Extrapulmonary	36 (22.1%)
Total	163 (100%)

Table 9: Sputum smear and culture status for notified pulmonary TB cases and notified extrapulmonary cases associated with pulmonary disease (in brackets) in the ERHA, 2002

	Sputum smear		
Pulmonary TB (P+E)	**Positive**	**Negative**	**Not done**
Culture +	48 (5)	35 (7)	2 (1)
Culture -	1 (0)	15 (2)	5 (2)
Not done	0 (0)	1 (0)	3 (0)
Total	49 (5)	51 (9)	10 (3)

Extra-pulmonary TB alone was notified in 36 cases. The sites involved were as shown in table 10.

Table 10: Extrapulmonary disease sites in the ERHA (includes cases with combined pulmonary and extrapulmonary disease) in 2002

Site	Number Cases
Pleural	17
Lymph extra-thoracic	15
Lymph intra-thoracic	1
Spinal	2
Genitourinary	6
Disseminated	1
Peritoneal	1
Bone/Joint	1
Skin	1
Meningeal	4
Colon	1

Table 11: Histology and culture status of extrapulmonary cases of TB in the ERHA in 2002

	Culture		
Extrapulmonary TB	**Positive**	**Negative**	**Total**
Histology +	7	4	11
Histology -	15	10	25
	22	14	36

Histology– means histology negative or not done
Culture negative means culture negative or not done

Table 12: Diagnosis for notified cases of TB, EHB/ERHA 1992-2002

	02	**01**	**00**	**99**	**98**	**97**	**96**	**95**	**94**	**93**	**92**
Pulmonary TB only (lab confirmed)	88	78	82	83	79	66	66	76	83	68	95
Presumed Pulmonary TB	24	23	26	41	32	31	16	39	45	45	
Extra pulmonary TB only	36	41	28	36	29	25	22	24	21	20	31
Pulmonary + extra pulmonary TB	17	18	8	11	12	6	6	7	7	10	5
(Pulmonary disease lab confirmed)	13		6	9	4	5	N/A	N/A	N/A	N/A	N/A

Drug Resistance

In 2002 eight cases of tuberculosis had an organism resistant to one or more antibiotics. There were six cases of isoniazid resistance in 2002- one of whom was also resistant to streptomycin. Two of the cases had smear positive pulmonary disease and occurred in Irish nationals. Two other cases had extra-pulmonary disease and these were from the Indian subcontinent. One further isoniazid resistant case was identified by immigrant screening, and the sixth case had widespread disseminated disease and was HIV positive. Another case in an African male was resistant to streptomycin, but sensitive to first line agents. One patient with Mycobacterium Bovis was pyrazinamide resistant

Table 13: Patterns of drug resistance 2002

	Isolate	Isoniazid	Pyrazamide	Streptomycin	Ethambutol
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.Bovis		+		
Case 8	M. TB			+	

Outcome

One hundred and forty three patients completed a full course of anti-tuberculous chemotherapy. Two patients with smear positive disease had their treatment interrupted for more than two months, including a young Irish female national and a young African male asylum seeker/refugee. Seven patients with TB were lost to follow up including a man from South East Asia, a prisoner with TB released from prison and two homeless Irish males.

Eleven notified individuals died in 2002 and TB was considered to be the cause of death in two of these cases. Both cases had documented HIV infection and included a young male African asylum seeker/refugee and a young Irish male with a history of intravenous drug abuse.

Contact tracing
In 2002 contact tracing continued to constitute a large workload for public health doctors and public health nursing staff, who have a special interest in TB in the community care areas.

Public Health doctors provided screening services 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) and locally in Kildare and Wicklow. Advice on site was available from a Respiratory Physician with a special interest in TB and from the department of Public Health in ERHA. In 2002 the medical staff of Peamount Hospital continued to be a valuable resource of medical advice on TB for public health physicians and the hospital also provided invaluable isolation facilities for infectious and difficult to treat patients. In 2002 Peamount hospital provided isolation and treatment for almost 40% of TB patients diagnosed in the ERHA region. Screening for TB continued to take place on-site where a case of smear positive pulmonary TB occurred in a school, a workplace or an institution.

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.[4] Quarterly returns are forwarded to the NDSC and are analysed, reported and disseminated to all regions in the country. This enhanced TB Surveillance System provides 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.

In 2001 the NDSC reported 381 cases of TB nationally, representing the lowest recorded incidence in Ireland (9.7/1000,000) since the introduction of the enhanced surveillance system. The number of TB cases notified in the ERHA region in 2002 has fallen slightly from 2001. One hundred and sixty three cases of TB were notified in 2002, (Crude notification rate of 11.6/100,000), compared to one hundred and seventy one cases in 2001 (Crude notification rate of 12.2/100,000). However the increase in the three year moving average evident since 1997 has continued.

Risk factors for TB remains unchanged compared to previous years and include age over 65, male sex, unemployed and having a previous history of TB. However in 2002 an increase in TB notifications was seen in the 25-44 year old age group, where seventy-one cases were recorded. Nine cases (5,5%) of the cases had a previous history of TB. This is however lower than recorded in 2000 and 2001 when 23(2000) and 18 (2001) gave a history of prior TB disease.

The increasing incidence of TB in the non-national population is a striking feature in this year's report. Over one third of all TB cases (59 cases) occurred in non-nationals of whom 23 were asylum seekers/refugees. Two cases (1.2%) were found by the immigrant screening services. Language barriers, cultural norms and a fear of authority can make treatment difficult especially in the asylum seeker group. Voluntary screening for TB and other infectious diseases is offered at the asylum seeker reception centers in the ERHA region but uptake is variable.

HIV associated TB has not proven to be as problematic as originally anticipate d in the 1980's.[3] There were fourteen cases of HIV associated TB reported in 2002 -four of which occurred in the asylum seeker group.. The true prevalence of HIV associated TB is underestimated as immune status was poorly documented on most notification forms. On occasion, cases, which had documented risk factors such as IVDU or Hepatitis C, did not specify immune status. Concerns over confidentiality of information are possibly responsible for this non-recording of immune status. Improved liaison and information sharing

between clinicians and public health physicians will facilitate the provision of more complete data in relation to this.

One hundred and forty three cases (87.7%) completed a full course of curative therapy. This compares favourably with that recorded in 2000 when 73% of notified cases were recorded as having completed treatment. However seven patients were lost to follow up and could provide a pool for the spread of drug resistant TB at a future date. Whilst directly observed therapy (DOTS) is requested on occasion for difficult patients, data on DOTS is not collated systematically. Close co-operation with our nursing colleagues is essential in managing the difficult patient and local arrangements with General Practitioners, local pharmacies or with the Drugs and Aids services have been availed of on occasion.

Four cases of TB meningitis were recorded - all occurring in adults, two of whom were diagnosed with combined pulmonary and meningeal TB. Two adults had not received prior BCG vaccination and BCG status was unknown in one other. It is reassuring the BCG has been a very effective vaccine in preventing TB meningitis in children.

TB remains a very important infectious disease, even in developed countries. It is important at a time of major health reform that our TB services are fully resourced and strengthened. There is no indication that TB is declining in the eastern region, and therefore there is a need for increased ancillary support services at TB clinics and in the community.

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