Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

SURVEILLANCE REPORT ON TUBERCULOSIS IN THE HSE WEST (CLARE, LIMERICK, TIPPERARY NORTH) IN 2005

February 2006

Prepared by

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The data used in this report were collected by Area Medical Officers (AMOs) in the three Community Care Areas (CCAs), now re-aligned as Local Health Offices of Primary Continuing & Community Care (PCCC) of the Health Service Executive West (Clare, Limerick, Tipperary North). Reports were collated at the Department of Public Health using the EPI-INFO NTBSS 2000 system. The area referred to as the Health Service Executive (HSE) West (Clare, Limerick, Tipperary North) is the region previously known as the Mid-Western Health Board.

The completed and finalised dataset was referred to the Health Protection Surveillance Centre in February 2006.

Analysis was performed in MS Access and Excel and EPI-INFO 2000. Denominator data for population rates used data from the 2002 Census of Ireland (unless specified otherwise).

Ireland	3,917,203
HSE West (CE LK TN) Population:	**339,591**
Co Clare	103,277
Co Limerick	175,304
North Tipperary	61,010

Note on rates and Census
Data on rates should be interpreted with caution. Where small numbers are quoted variances can be large and not statistically significant.
Data for 1994-1999 based on Census 1996, data 2000-2005 based on Census 2002.
The population rates published in previous TB surveillance reports (2000 and 2001) have been corrected in this report to reflect the rates based on the national and HSE West (Clare Limerick Tipperary North) population census of 2002.

Acknowledgements: The Department of Public Health thanks Dr Carmel Collins, Dr Fiona O'Dea, Dr Phil FitzGerald and Dr Joe Quinn and the Principal and Senior Medical Officers for their follow-up on all these cases. Thanks to Breda Tuohy and Clare Harwood-Smith for data entry using the NTBSS 2000 and Dr Fionnuala Donohoe, Specialist Registrar Public Health Medicine for review.
The co-operation of the respiratory physicians and microbiology laboratory staff in the Mid-Western Regional Hospital was greatly appreciated.
The staff of the Health Protection Surveillance Centre (HPSC) are acknowledged for the provision of national surveillance data and the distribution of regular bulletins concerning infectious disease in Ireland.

1. Summary data:

In 2005, there were 61 suspected cases of tuberculosis (TB) in the HSE West (Clare, Limerick, Tipperary North). After validation, eight cases were denotified (not cases or diagnosis changed, confirmed with AMO or respiratory physician).

In total, there were 53 confirmed cases of TB in the Area in 2005. This corresponds to a crude annual incidence rate of 15.6/100,000 population (95% Confidence Interval: 11.4-19.8).
This compares to 44 cases in 2004, 42 cases in 2003, 32 cases in 2002, 26 cases in 2001, 47 cases in 2000, 54 cases in 1999 and 47 in 1998.

The trend in the crude annual incidence of TB in the HSE West (Clare, Limerick, Tipperary North) is shown in Table 1 and Figure 1.

Table 1: Annual crude incidence rate of TB in HSE West (Clare, Limerick, Tipperary North) 1992 – 2005.

Year	Crude annual incidence rate/100,000
1992	20.9
1993	18.0
1994	17.7
1995	15.4
1996	17.7
1997	15.1
1998	14.8
1999	17.0
2000	13.8
2001	7.7
2002	9.4
2003	12.4
2004	13.0
2005	15.6

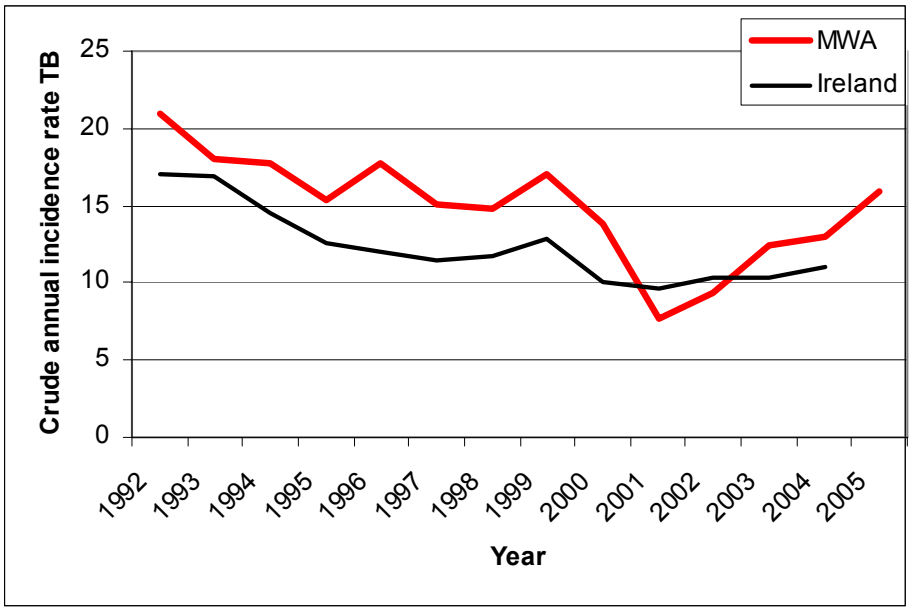


Figure 1: Crude annual incidence of TB in HSE West (Clare, Limerick, Tipperary North) and Ireland, 1992 – 2005.
(rates used 1991, 1996, 2002 Census data where appropriate)

The change in the trend in the rate of TB in the region needs to be monitored closely over time. It does appear that there is a reversal of a previous downward trend in TB in the area. Nationally, the decline in TB has halted. It is unclear whether this trend is temporary or evidence of a changing pattern in terms of demography or diagnosis, however preliminary data for 2006 indicates no change in the current pattern in the HSE West (Clare, Limerick, Tipperary North).
Very often, outbreaks can affect the crude annual rate, leading to spikes from year to year. Looking at the "smoothed" three year moving average of the crude rate, we can see that the national downward trend in TB has entered a plateau and this is the case also in the HSE West (Clare, Limerick, Tipperary North), Table 2.

Table 2: Three-year moving average incidence rate of TB in HSE West (Clare, Limerick, Tipperary North) 1992 – 2004

Year	**3-yr moving average incidence rate/100,000**
1992	20.0
1993	18.7
1994	17.2
1995	17.2
1996	16.5
1997	15.7
1998	15.4
1999	15.9
2000	12.8
2001	9.6
2002	9.7
2003	11.8
2004	13.5

While the downward trend in TB nationally has formed a plateau, in the HSE (Clare, Limerick, Tipperary North) the trend appears to show a resurgence of TB, Figure 2.

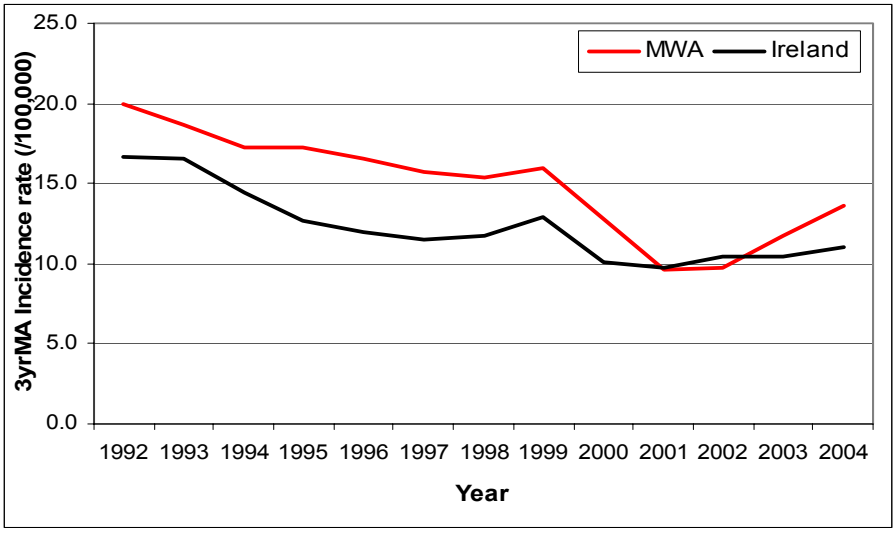


Figure 2: Three-year moving average incidence rate of TB in HSE West (Clare, Limerick, Tipperary North) and Ireland, 1992 – 2004.
(rates used 1991, 1996 and 2002 Census data where appropriate)

Notifications occurred throughout 2005 with February having a large number of notifications as seen in Figure 3

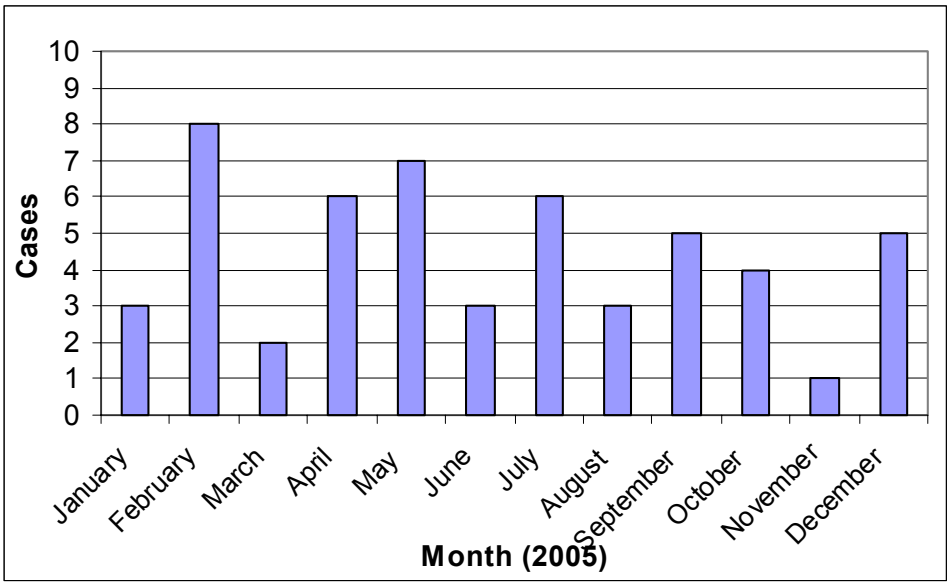


Figure 3: Cases of TB in 2005 in HSE West (Clare, Limerick, Tipperary North) by month of notification.

Compared to 2004, there was an improvement on average delay from diagnosis to notification. Average delay in 2005 was 9.2 days compared to 15.6 days in 2004. The range in 2005 was 0-54 days (Median; 1 day).

Efforts to address delays in notification to the Department of Public Health have been made and these will improve the public health response where outbreaks could occur. The concern is that contacts who are infectious may have an opportunity to infect others before being assessed and offered appropriate intervention.

Public Health staff ensure that contacts of infectious tuberculosis cases are identified and offered appropriate testing and follow-up. Full operational responsibility for this function transferred to the Department of Public Health from community care services on December 11th 2006. This includes responsibility for the chest clinics, which are held in the Out Patients Department, Mid-Western Regional Hospital, Limerick on Thursday and Friday mornings. Clinics are held in Nenagh on Wednesday afternoons as required and the County Clinic, Ennis on Monday afternoons as required. All clinical notifications of infectious diseases should be forwarded to the Department of Public Health as well as queries regarding the follow-up of contacts.

Geographical distribution:
The percentage of cases seen in the Clare CCA in 2005 (41%) was higher than in 2004 (27%), whereas the percentage in Limerick CCA fell 3%. The percentage of cases seen in the E. Limerick/North Tipperary CCA (21%) is lower than that seen in 2004 (32%) (Table 3).

Table 3: Cases of TB by Community Care Area (CCA) in HSE West (Clare, Limerick, Tipperary North), 2005 (n=53).

CCA	Cases	%
Clare	24	41
Limerick	20	38
North Tipperary/E. Limerick	11	21

The percentages are represented in Figure 4.

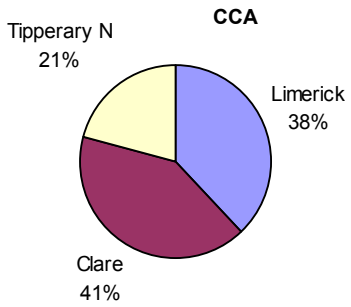


Figure 4: Pie chart of percentage of cases in each HSE West (Clare, Limerick, Tipperary North) CCA, 2005.

The population estimates for CCA are not as reliable as county estimates so further rates are based on county population. Future LHO areas will be more explicitly defined regarding population.

Table 4: Cases of TB by county in HSE West (Clare, Limerick, Tipperary North), 2005 (n=53):

County	Population	Cases	CAIR	95% CI
Clare	103,277	22	21.3	12.4 – 30.2
Limerick	175,304	26	14.8	9.1 – 20.5
N Tipperary	61,010	5	8.2	1.01 – 15.4

CAIR = crude annual incidence rate per 100,000. CI = Confidence Interval

Table 4 shows the annual TB incidence rate in 2005 in Limerick (14.8) showed little change compared to 14.3 in 2004. The rate in Clare has increased compared to 2004 (11.6). While the rate in Clare doubled, the increase is not statistically significant. Five cases were reported from North Tipperary compared to seven in 2004, two in 2003, one in 2002 and two cases in 2001. There is no significant statistical difference between the areas in 2005 and no significant difference between the rates in 2005 compared to 2004.

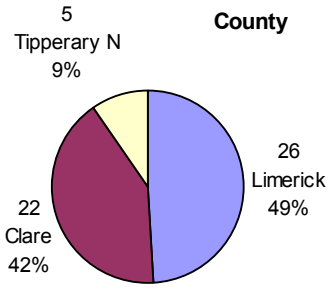


Figure 5: Pie chart of percentage of cases in each HSE West (Clare, Limerick, Tipperary North) county, 2005.

The proportion of cases of TB in 2005 in Limerick is not as high compared to recent years (57% in 2004 and 78% in 2003).

Seventy-two percent of cases reported were Irish-born persons (38/53) in 2005. There were 15 cases of TB reported in foreign-born persons. The countries of origin of the cases are shown in Table 5. Five of these cases were reported from Limerick nine were reported from Clare and one in North Tipperary.

Table 5: Country of origin of foreign-born TB cases, 2005

Country	**Cases**
India	*3*
China and Hong Kong	*2*
Philippines	*2*
Morocco	*1*
Nigeria	*1*
Pakistan	*1*
Poland	*1*
Somalia	*1*
South Africa	*1*
United Kingdom	*1*
Australia	*1*
Total	*15**

**Given the arrival to Ireland in one case was over 70 years before, this case is treated with indigenous population.*

Two cases were detected in the asylum seeker population. Data excluding 14 foreign-born national cases can be presented to show the incidence in the indigenous population alone, by county (Table 6). There is no statistically significant difference in CAIR between the counties.

Table 6: Cases of TB by county in HSE West (Clare, Limerick, Tipperary North) 2005 (indigenous population only n=39):

County	**Population**	**Cases**	**CAIR**	**95% CI**
Clare	92,383	14	15.2	7.2 – 23.1
Limerick	164,524	21	12.8	7.3 – 18.2
N Tipperary	57,671	4	6.9	0.14 – 13.7
All	314,578	39	12.4	8.5 – 16.3

CAIR – crude annual incidence rate per 100,000. CI = Confidence Interval

Accommodation

Of all TB cases in 2005, 45 cases were reported as living at home. Two cases were reported as living in a hostel, one was living in an institution, one in a B&B/Hotel and two in other accommodation. In two cases accommodation status was unknown.

2. Sex distribution:

Of the 53 cases confirmed in the HSE West (Clare, Limerick, Tipperary North), 36 were male (68%) and 17 were female (32%), Figure 6. The male to female ratio was 2.1:1. This is an increase on the ratio seen in 2004 (1.4:1).

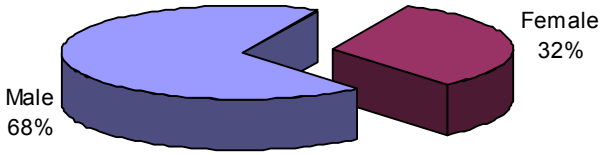


Figure 6: Pie chart illustrating sex distribution of TB cases in HSE West (Clare, Limerick, Tipperary North), 2005.

Despite TB incidence being twice the rate in males compared to females, there is no statistically significant difference in the incidence of TB in males and females at the 95% significance level. The crude annual incidence rate in males is 21.1 (95% Confidence Interval; 14.2 – 28.0) and in females 10.1 (95% Confidence Interval; 5.3 – 14.8).

Table 7 shows the cases in each county by sex.

Table 7: Distribution of TB cases by sex in HSE West (Clare, Limerick, Tipperary North), 2005 (n=53)

	Clare	**Limerick**	**N Tipperary**
Cases	22 (14)	26 (21)	5 (4)
Males	18 (12)	16 (13)	2 (2)
Female	4 (2)	10 (8)	3 (2)

() = Indigenous population cases.
Due to small numbers, the confidence intervals are large and overlap.

3. Age Distribution:

The distribution of cases of TB in different age groups was analysed. Direct methods of standardisation were used to compare the data from the region with the Irish population. The age range of cases in HSE West (Clare, Limerick, Tipperary North), 2005 was 3 years to 83 years (Mean age 45.7yrs). In 2005 the mean age was higher compared to 2004 (44.5 yrs); 2003 (46.5 years), 2002 (44.8 years), 2001 (56.8 years), and 2000 (45.5 years).

Table 8: Mean age of TB cases in HSE West (Clare, Limerick, Tipperary North) counties, 2005.

County	**Mean age in years (2004 for comparison)**	**n**
Clare	48.3 (49.9)	22
Limerick	43.3 (39.0)	26
Tipperary N	46.6 (54.6)	5

The mean age of cases in the Limerick area increased in 2005, Table 8. The development of active disease in the younger population is cause for concern. Table 9 shows the number of TB cases by age group for sex and county.

Table 9: Distribution of TB by age in HSE West (Clare, Limerick, Tipperary North) and counties, 2005.

Age group	**All**	**Males**	**Females**	**Limerick**	**Clare**	**N Tipperary**
0 – 4y	1	1	0	0	1	0
5 – 14y	1	0	1	1	0	0
15 – 24y	7	3	4	3	3	1
25 – 34y	7	5	2	3	4	0
35 – 44y	11	9	2	7	3	1
45 – 54y	10	5	5	7	2	1
55 – 64y	5	4	1	2	2	1
65+y	11	9	2	3	7	1

The age standardised incidence rate of TB in the HSE West (Clare, Limerick, Tipperary North) was calculated to be 15.5 (95% CI: 11.3 – 19.7). For the counties, the age standardised rates were calculated as:

Clare	21.3 (95% CI: 12.0 – 30.6)
Limerick	14.9 (95% CI: 9.2 – 20.7)
North Tipperary	7.9 (95% CI: 0.9 – 14.9)

In 2005, the rate of TB in the older groups (over 55 years) was unchanged compared to the rate in 2004. There continues an increase in the high rate of cases in the younger age groups (15-54 years) in the HSE West (Clare, Limerick, Tipperary North) in 2005 (Figure 7), the rate in females and older males increasing particularly.

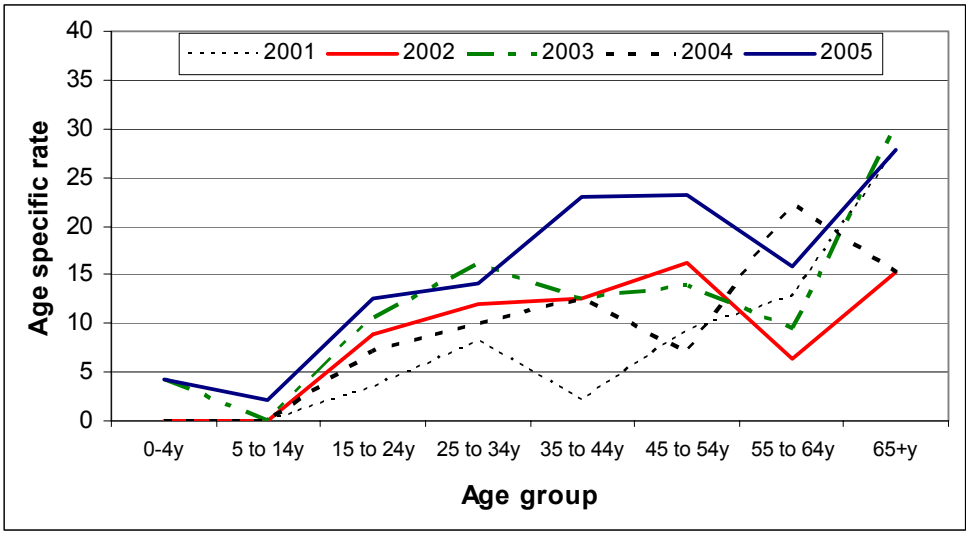


Figure 7: Age distribution of TB cases in HSE West (Clare, Limerick, Tipperary North), 2005 (2001, 2002, 2003 and 2004 for comparison).

Age and sex specific TB rates were calculated in Table 10.

Table 10: Age and sex specific incidence rates of TB in HSE West (Clare, Limerick, Tipperary North), 2005.

Age group	All	Males	Females
0 – 4y	4.2	8.3	0.0
5 – 14y	2.1	0.0	4.3
15 – 24y	12.5	10.4	14.7
25 – 34y	14.1	19.8	8.2
35 – 44y	23.0	37.1	8.5
45 – 54y	23.3	22.7	23.8
55 – 64y	15.9	25.1	6.4
65+y	27.9	51.4	9.1

The rates of disease in the HSE West (Clare, Limerick, Tipperary North) in those aged 25-55 years in 2005 are higher than rates reported nationally for these age groups in 2004.

The difference between the male and female rates in each age group is shown graphically in Figure 8.

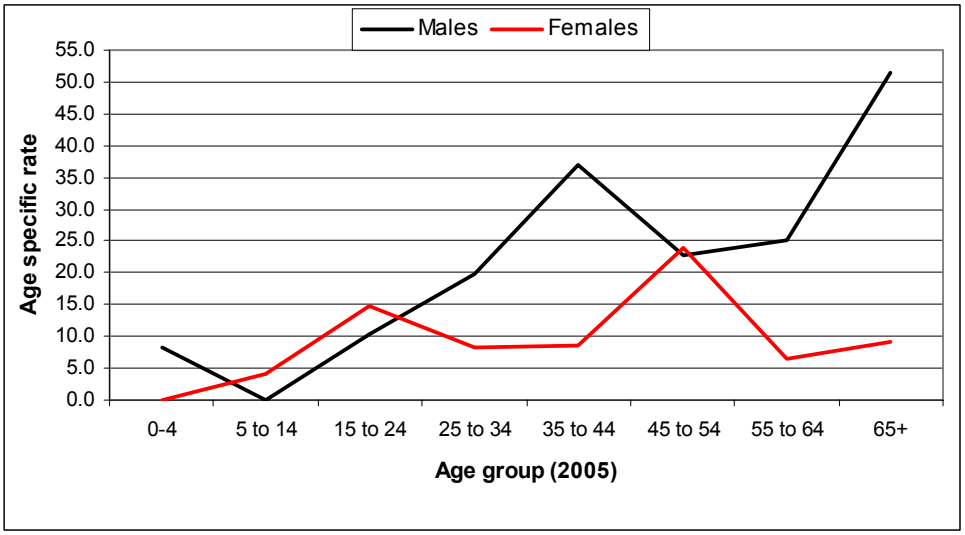


Figure 8: Age and sex specific incidence rates of TB in HSE West (Clare, Limerick, Tipperary North), 2005 (n=53).

In 2005, the unusually higher rate of TB in younger age groups, is now not only evident in males, but in females also. Tuberculosis in older males (particularly Clare) is also increased compared to previous years.

Table 11: Age specific incidence rates of TB in HSE West (Clare, Limerick, Tipperary North) counties in 2005.

Age group	Limerick	Clare	N Tipperary
0 – 4y	0.0	13.1	0.0
5 – 14y	4.2	0.0	0.0
15 – 24y	9.3	20.4	11.2
25 – 34y	11.2	26.9	0.0
35 – 44y	29.2	19.7	11.5
45 – 54y	32.4	14.9	12.6
55 – 64y	12.7	20.1	17.3
65+y	15.7	57.3	12.2

The incidence of TB in males in some age groups in Limerick and older Clare males increased in 2005 compared to 2004, Table 11. Comparing 2004 with 2005, Clare and Tipperary North experienced a rise in the TB rate in most age groups, see Figure 9.

To assess the effect of the percentage of foreign-born TB cases (18%), rates were calculated based on indigenous cases only (figures 10 and 11). These must be interpreted with caution as data from previous years did not exclude foreign-born TB cases.

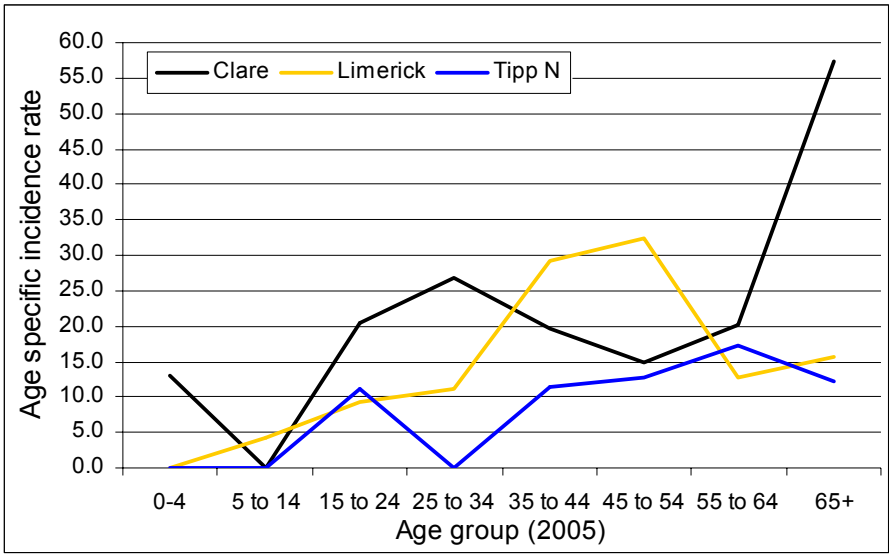


Figure 9: Age specific incidence rate of TB in counties Clare, Limerick and North Tipperary, 2005.

Figure 10 shows the age and sex specific incidence rate for the indigenous cases only. This assumes TB infection was acquired in Ireland in each Irish-born case and that the excluded foreign-born cases all acquired TB infection outside Ireland.

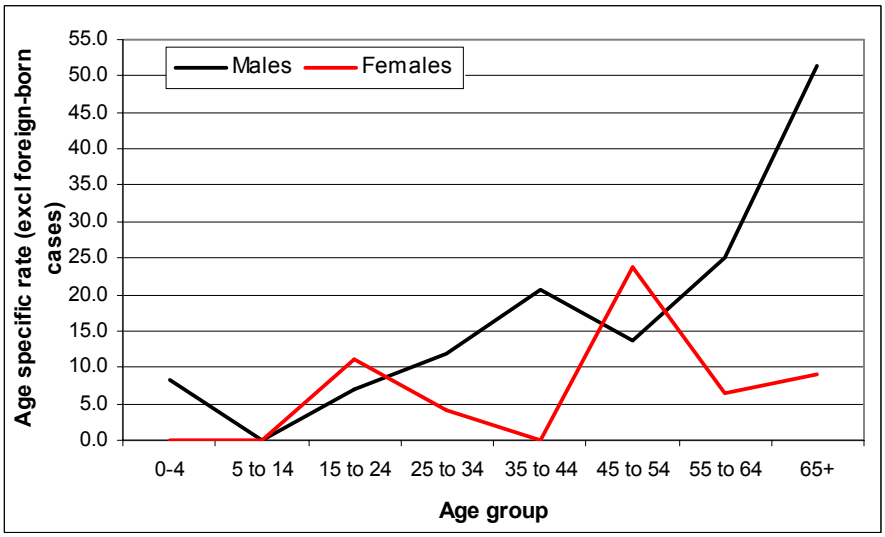


*Figure 10: Age and sex specific rates of TB **excluding** 14 foreign-born cases in HSE West (Clare, Limerick, Tipperary North), 2005.*

Confining the examination of data to Irish born persons results in a lower rate of disease in the younger (<55 years) age groups in the region. This is perhaps a fairer reflection of the trend in Clare and Limerick, Figure 11.
Figures and rates broken down by age and sex and county become small and may show marked variation year on year.

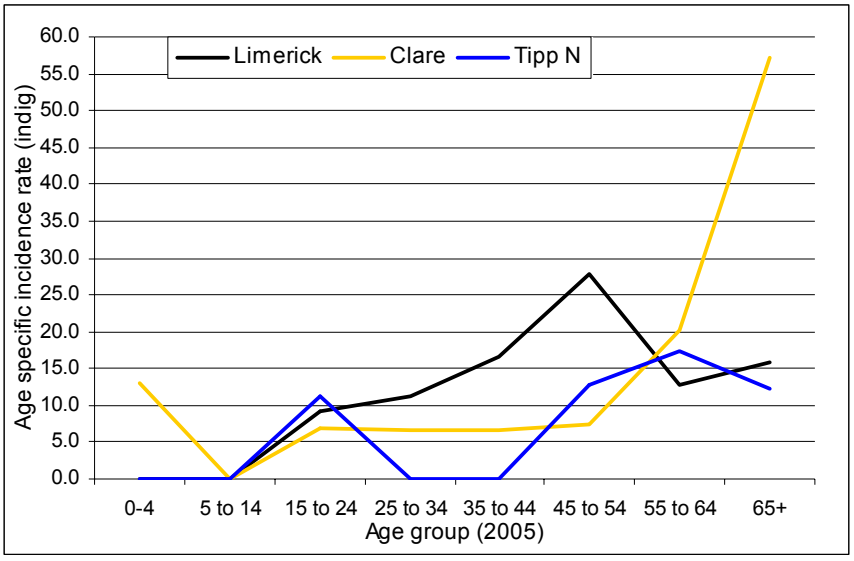


*Figure 11: Age specific incidence rate of TB by county in HSE West (Clare, Limerick, Tipperary North), 2005 (**excluding** 14 foreign-born cases).*

Excluding 14 foreign-born cases, the mean age of the cases of TB is higher in Clare and slightly higher in Limerick. There were no foreign-born cases in Tipperary North.

HSE West (Clare, Limerick, Tipperary North)	50.0 years
Clare	57.5 years
Limerick	45.1 years
Tipperary North	49.3 years

As with all summary indicators based on small numbers, variations should be interpreted with caution as changes from year to year may not be statistically significant.

4. Diagnostic classification:

Criteria to define classifications are based on national and international standards (see Appendix).

Like 2004, there was one case of TB meningitis in 2005. This case involved an Irish-born adult.

Diagnostic classification was recorded in 100% of cases in the region, Table 12.

Table 12: Diagnostic classification of TB in HSE West (Clare, Limerick, Tipperary North), 2005 (n=53)

Area	P (%)	E (%)	P+E (%)	Pri (%)	Total (%)
HSE M-W	38 (72)	12 (22)	3 (6)	0 (0)	53 (100)
Clare	14	7	1	0	22
Limerick	20	4	2	0	26
N Tipperary	4	1	0	0	5

P=Pulmonary E=Extrapulmonary Pri=Primary

The percentage of cases with a pulmonary (P or P&E) component (77%) is higher than 2004 (71%) and 2003 (71%). While the percentage of cases being extrapulmonary is lower compared to last year, most of the extrapulmonary cases in 2005 were in the Clare area.

Extrapulmonary sites (15) involved were reported as:

Site	Cases
Pleural	3
Genitourinary	3
Lymph extrathoracic	2
Lymph intrathoracic	1
Meningeal	1
Spinal	1
Bone	1
Other unspecified)	3 (one pericardial effusion; one neck aspirate; one

5. Laboratory Investigation:

Table 13 shows the number of TB cases with sputum or bronchial washings positive "direct AFB". Pulmonary cases with "direct AFB" positive are more infectious.

Table 13: Cases investigated by direct smear examination, HSE West (Clare, Limerick, Tipperary North) 2005.

Direct AFB Stain	All cases (n=53)	Pulmonary TB (n=41)
Positive	25	25
Negative	16	14
Not done	4	2

(8 cases extrapulmonary).

Of 25 "pulmonary TB smear positive" cases detected, 23 were culture positive (20 isolates were *M. tuberculosis* and two were *M. bovis*). One isolate reported culture positive failed to grow for identification and susceptibility testing.

Eight isolates of *M. tuberculosis* were detected in sputum (or bronchial washings) direct AFB (acid fast bacilli) negative cases of pulmonary TB.

Five isolates of *M. tuberculosis* were detected in cases classified extrapulmonary TB. (incl. neck aspirate and cervical lymph node)

Forty-one cases had a pulmonary component to the disease classification. Of these cases, 30 (73%) were culture positive and 25 (61% of all pulmonary cases and 68% of all culture positive cases) were positive on direct AFB smear. This corresponds to a direct smear positive rate of 7.4 /100,000 population (95% CI: 4.5 – 10.2). This is twice the rate seen in 2004 (3.8) but the difference is not statistically significant.

Susceptibility patterns on all 33 isolates of *M. tuberculosis* and 2 isolates of *M. bovis* were provided. Thirty-two *M. tuberculosis* isolates were found susceptible to rifampicin, pyrazinamide, isoniazid and ethambutol. One isolate was resistant to isoniazid. No multi-drug resistant isolates were detected.

In 14 cases involving foreign-born nationals there were six pulmonary cases and seven extrapulmonary cases and one both P&E, eight were culture positive for *M. tuberculosis*.

The two isolates of *M. bovis* were detected males with pulmonary TB in Limerick and Tipperary and were susceptible to rifampicin, isoniazid and ethambutol.

Active TB was diagnosed on chest X-ray in 30 cases (28 recorded a pulmonary component, one had both P&E). X-ray findings showed a further extrapulmonary case with pleural effusion. Inactive/old TB was recorded in five cases with a pulmonary component, though three proved culture positive.

Microbiological culture was the sole positive finding in six cases.

Histology was positive in five cases, four extrapulmonary. The result was corroborated by culture or x-ray in all cases.

Overall, seven cases were diagnosed on a clinical basis (four extrapulmonary, three pulmonary.

6. Risk Factors:

Data on risk factors was available in nine cases. Two cases reported excess alcohol consumption, two cases reported diabetes, one reported immunosuppression and two reported a malignancy while one reported drug use and another reported family history of TB. Twenty-five cases reported no risk factors while in nine cases risk factors were unknown. In ten cases no data was provided.

Nine cases reported a previous history of TB (one case in 1944, 1945, 1954, 1957,1996 and 2003 – three year not given), 37 cases reported no history of TB – three cases had no data and four recorded history of TB as unknown.

Nineteen cases reported a history of BCG (five reported no history of BCG, 11 history unknown and 18 cases no data given). Eleven cases had a "scar present" and all had reported a history of BCG. No scar was seen in seven cases. However, data on

many cases was unknown or incomplete for this question – thirty-five unknown or no data given.

In 2005, 46 cases presented as a case of TB, three were detected through screening and three by other means (no data was provided on one case)

Outcome data:
Outcome data was acquired for 50 cases notified (95%), Table 14.

Table 14: Category of outcome for TB cases in HSE West (Clare, Limerick, Tipperary North), 2005 (n=53).

Outcome	**Cases**
Completed therapy	38 (72%)
Died	7
Lost to follow-up	3
Still on treatment	2
No data	3

Five males and two females died. TB was specified as cause of death in two cases but not as the cause in four others.
The percentage of those who had therapy completion verified is similar compared to 2004.

7. Comment:
Overall, the completeness and timeliness of the data collection and reporting of the enhanced TB surveillance system in 2005 was very good.
Outbreaks of TB will cause some areas to experience an increase in rates for periods of time. Increased awareness and complete reporting can cause variations in the TB notification rates. For the first time, the capture of molecular typing of TB isolates is allowing greater assessment of linkages between cases in the Mid-West.
In recent years, the incidence of TB is consistently highest in Cork Dublin, Waterford and Limerick. Further work is needed to elucidate the epidemiology of the disease in urban and rural areas. Data collection on BCG must improve and considerable effort and determination will be needed to achieve this and maintain complete outcome surveillance in future.
Greater vigilance and timely reference laboratory facilities are needed to guard against the threat of antimicrobial resistance.
In 2005 there was a sharp rise in cases in Clare, several extrapulmonary cases were notified. The rate of tuberculosis in Clare and Limerick is high in comparison to national rates.
General practitioners in the Clare and south county Limerick area should continue to be alert for further cases in those regions.
It is very important that when samples are sent to the Microbiology Laboratory for testing that investigation for TB is specifically requested if suspected.

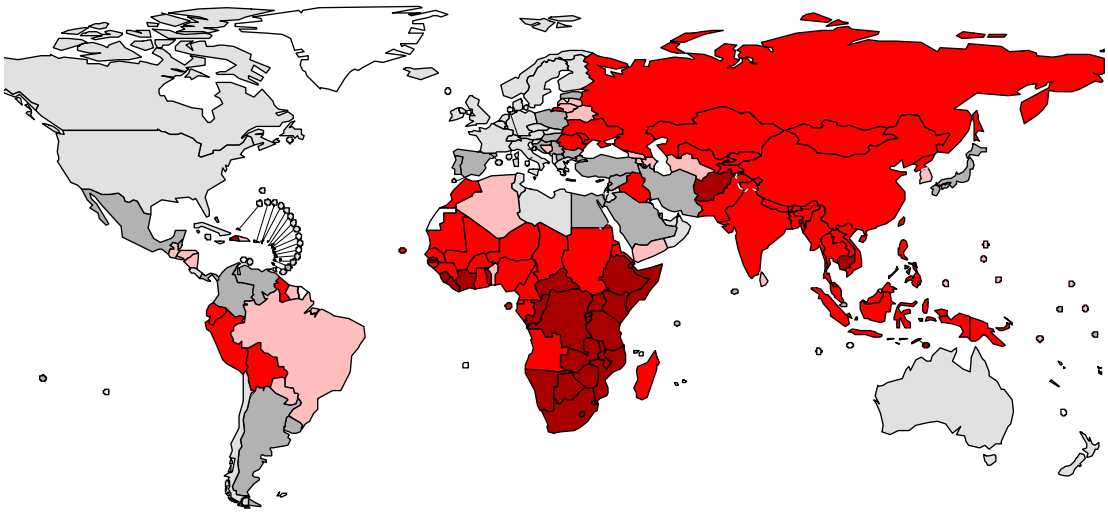
Preliminary Results for 2006 show a small drop in the level of tuberculosis disease in comparison to 2005, particularly in Clare.

Worldwide, the incidence of tuberculosis is increasing. Further information on the epidemiology of tuberculosis and antimicrobial resistance is available at http://www.eurotb.org/

Many more people are infected with TB than show disease. The threat from multi-drug resistant TB (MDR-TB) is still present within Europe.

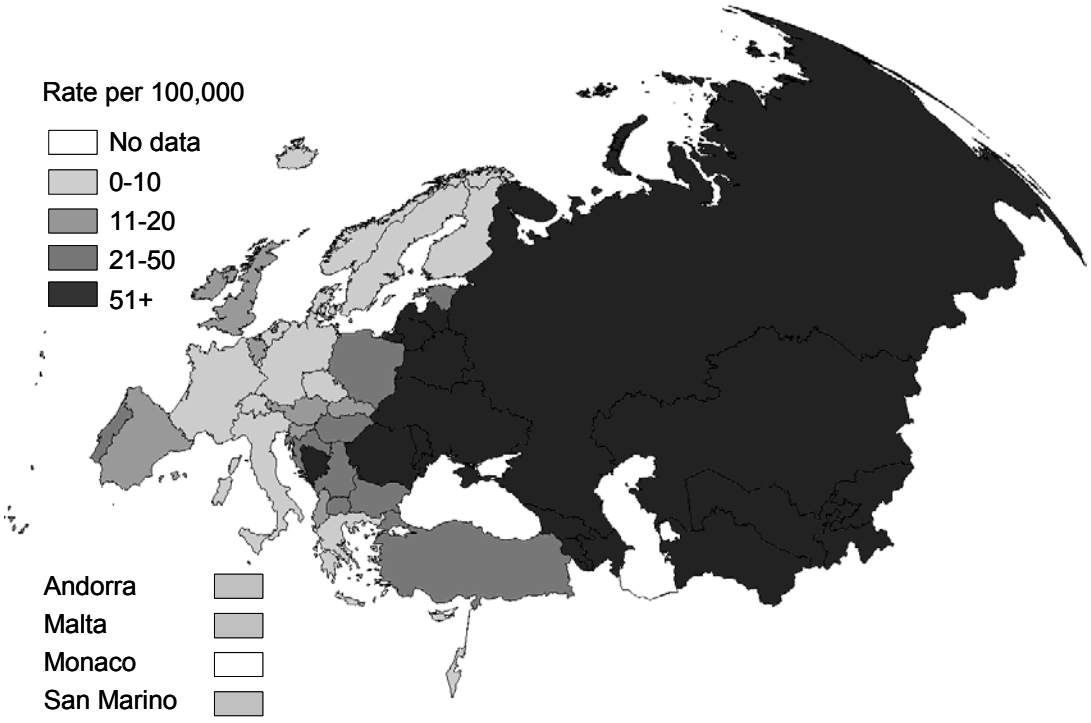
A recent paper demonstrates the concern about MDR-TB in Europe: Falzon D, Infuso A ‡, Aït-Belghiti F. **In the European Union, TB patients from former Soviet countries have a high risk of multidrug resistance** Int J Tuberc Lung Dis 2006 ; 10: 954-958

In recent months there is concern about the rise in XDR-TB – extensively drug resistant *M. tuberculosis*.
This disease has caused outbreaks in specific areas of South Africa. Special measures are taking place with respect to surveillance to boost European alertness in case the disease is detected here.



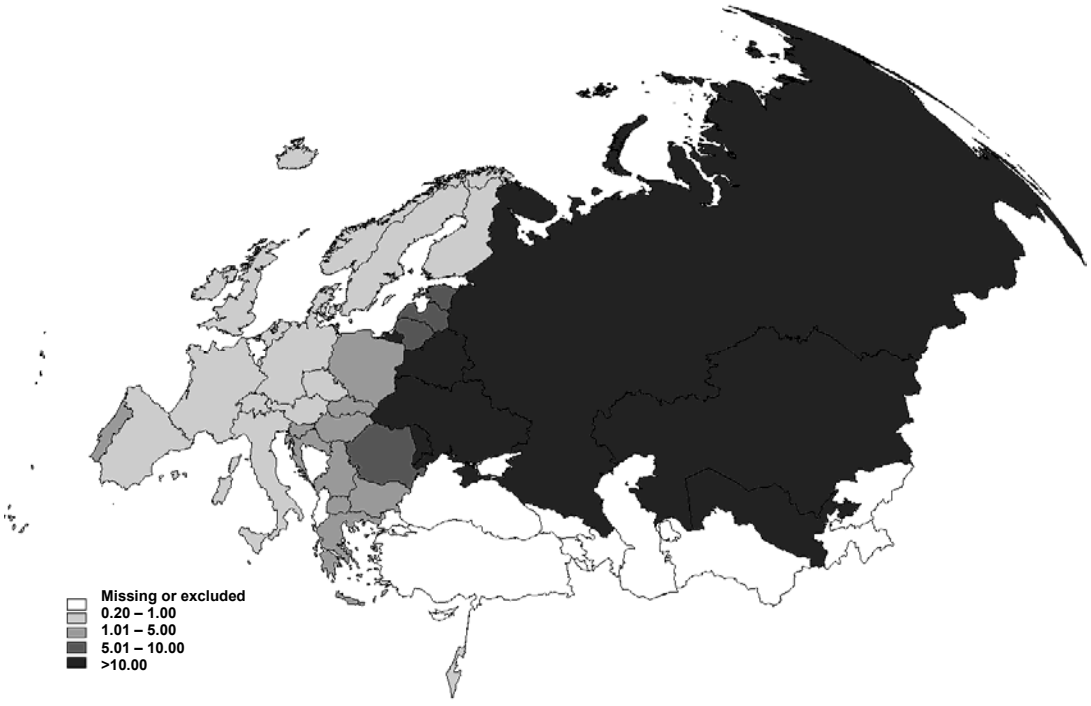
Map 1: Estimated Incidence of Tuberculosis worldwide in 2004 (WHO)

In parts of Europe, the rate of TB is very high (Map 2). EuroTB data also presents information on the proportion of cases in Europe of foreign origin, available on the EuroTB website..



Map 2: TB Notification rate/100,000 population European region in 2004 (WHO)

In Ireland, tuberculosis is no longer the fatal disease of the last century, however mortality rates around Europe do vary (Map 3).



Map 3: TB Mortality rate/100,000 population European region 2000-2004 (WHOSIS)

March 22nd 2007 is International World TB Day

Appendix:

Case Definitions

The case definitions used were those recommended by the National TB Working Group (1996).

- **A notified case** of TB referred to clinically active disease due to infection with organisms of the Mycobacterium tuberculosis complex. Active disease was presumed if the patient was commenced on a full curative course of anti-tuberculosis chemotherapy. Persons placed on chemoprophylaxis for preventive treatment or infected by mycobacterium other than M. tuberculosis complex were not included as cases.
- **A definite case** of tuberculosis was a case with culture confirmed disease due to M. tuberculosis complex.
- **An other than definite case** met both of the following conditions: (1) It was the clinician's judgement that the patient's clinical and/or radiological signs and/or symptoms were compatible with tuberculosis and (2) The physician took the decision to treat the patient with a full course of anti-tuberculosis therapy.
- **Pulmonary TB** was defined as a laboratory confirmed case-either a positive smear, histology or culture-with or without radiological abnormalities consistent with active pulmonary TB or a case where the physician took the decision that the patient's clinical symptoms and/or radiological signs were compatible with pulmonary TB.
- **Extra-pulmonary TB** was defined as a patient with a smear, culture or histology specimen, from an extra-pulmonary site, that was positive for M. tuberculosis complex or a case with clinical signs of active extra-pulmonary disease in conjunction with a decision taken by the attending physician to treat the patient with a full curative course of anti-tuberculosis chemotherapy.
- **Pulmonary and Extra-pulmonary TB** was a case of tuberculosis that met the previous two definitions.
- **Primary TB** was defined as a patient with a negative smear, culture or histology specimen but which 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 2000 notification.
- **Indigenous Population** was defined as those who were born in Ireland