

## TUBERCULOSIS IN NSW, 1991–2000

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The control of tuberculosis remains an important public health challenge in NSW. While rates in the state remain among the lowest in the world, the fact that many people in the state's population have lived in countries with high prevalences of the disease, means that the potential for an increase in its incidence is ever present.

Tuberculosis is caused by infection with the bacteria *Mycobacterium tuberculosis*. Only about 10 per cent of people who are infected with the bacteria will go on to develop the disease at some time in their life. Half the risk of disease occurs in the first two years after infection. The disease can affect many organs, but in most cases it affects the respiratory system. Tuberculosis is spread when a person with tuberculosis of the lungs or larynx exhales the bacteria into the air, usually by coughing, and another person inhales it. Tuberculosis can usually be cured with a six-month course of multiple antibiotics. Preventive therapy with specific antibiotics can also markedly reduce the risk that infection will lead to disease.<sup>1</sup>

Surveillance is essential for identifying patients with tuberculosis, both to ensure that they receive optimal treatment, and to ensure that other people who have been in contact with them are counselled, tested, and treated if they are infected with tuberculosis. These services are provided in NSW free of charge by the network of chest clinics within the area health services. On a population level, surveillance enables health departments to identify groups at risk and long term trends in the disease, which inform the development of prevention policies.

## METHODS

We reviewed NSW Department of Health annual reports from 1929—when statewide reporting of tuberculosis began—to obtain historical summaries of tuberculosis case counts for NSW and to identify major policy changes in the control of tuberculosis. Under the *NSW Public Health Act 1991*, all doctors, laboratories and hospitals must notify suspected cases of tuberculosis to the local public health unit (PHU). PHU staff record case details on a confidential statewide database. We analysed the characteristics of cases of tuberculosis, hospitalisations, and deaths notified to PHUs between 1991 and 2000. Incidence rates were calculated using the Australian Bureau of Statistics estimated mid-year population for the relevant year, except for Aboriginal and Torres Strait Islander status, for which 1999 estimates were used. Country of birth was only reliably available in the

database for cases from 1995, and analysis on this variable was only included for cases notified from 1995 to 2000.

## RESULTS

### Historical reports

Before World War II, the incidence of tuberculosis was around 60–70/100,000. The incidence of tuberculosis declined sharply in the 1950s and 1960s. This decline occurred following the introduction of antibiotic treatments, the introduction of chest x-ray screenings of the population, and improved living conditions (Figure 1). The decline levelled out in the late 1970s, most likely reflecting changing immigration patterns to NSW, and the case rate has been maintained at around 7/100,000. In 1960, of the 1540 tuberculosis cases reported, 78 per cent were Australian born, 19 per cent European, two per cent Asian, and one per cent of cases came from other countries. This is a very different pattern from that seen in the last decade, which is described below.

### Case notifications 1991–2000

In 2000, 433 cases were notified, (a rate of 6.7/100,000) (Table 1). For 1991 to 2000, 4181 cases of tuberculosis were notified in NSW, an average of 418 per year (6.8/100,000).

### Demographics

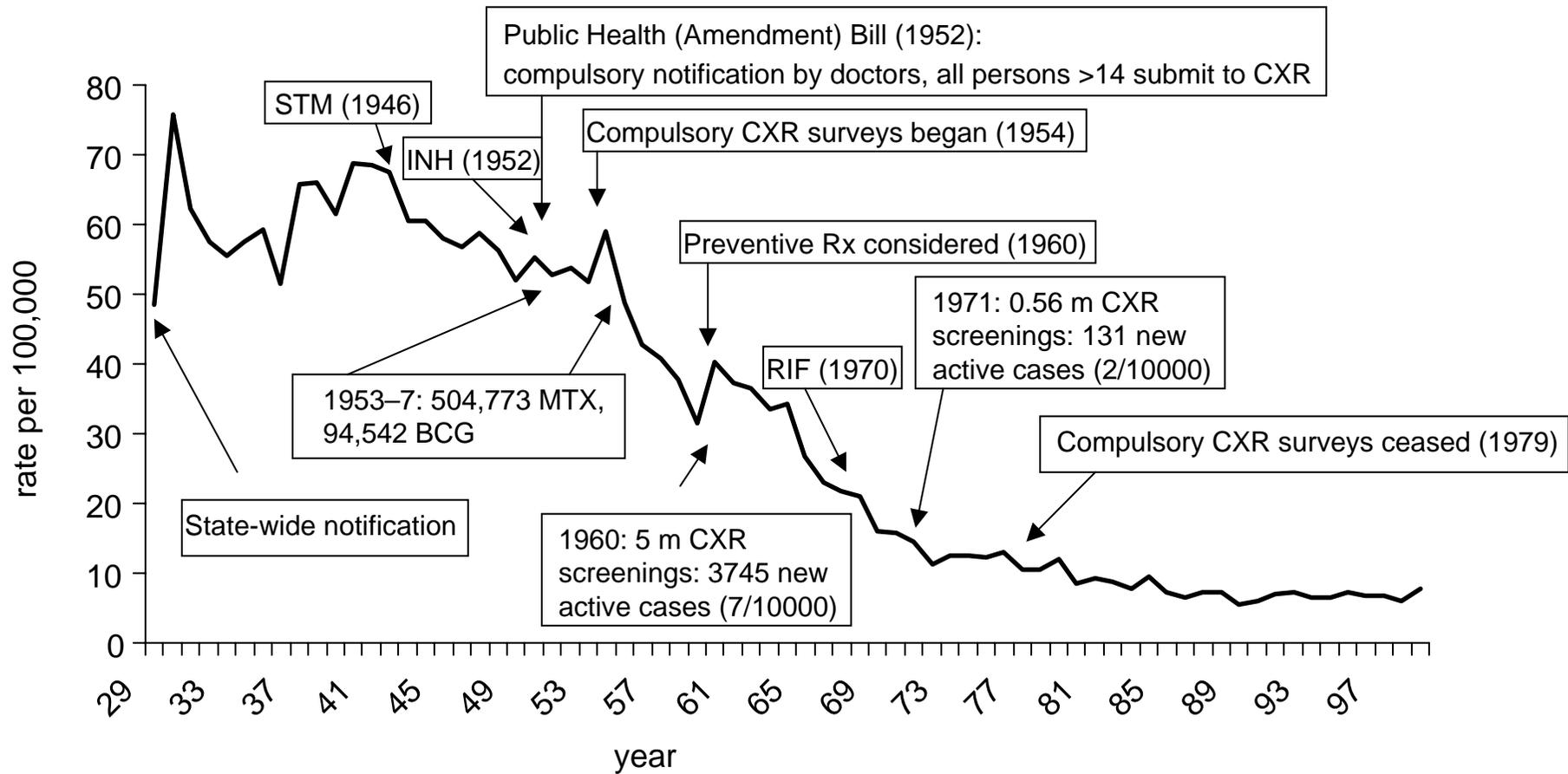
In 2000, the incidence of tuberculosis was much higher among people living in the Sydney metropolitan area, reflecting the fact that most people from high prevalence countries tend to initially settle in Sydney (Table 2). The incidence was similar by sex, but varied with age: it was highest among people aged 65 years and older, and lowest among children and adolescents. Preschool-aged children had a higher rate than older children. In 2000, Aboriginal or Torres Strait Islander people accounted for one per cent of patients. By birthplace, 83 per cent of cases were born overseas, mostly in Asia (64 per cent of all cases). The rate of disease was lowest in people born in Australia, and highest among people born in Asia. A similar pattern was seen for the decade 1991–2000. The proportion of patients who were born in Australia has steadily declined in the last 10 years, from 21 per cent in 1991 to 17 per cent in 2000.

### Disease

In 2000, the most common reported site of disease was the lung, followed by the lymphatic system, and the pleura. Reporting of the site of disease has improved in recent years, and the pattern is similar to that reported for 1991–2000 (Table 3). For 2000, case classification was reported as new disease for 87 per cent, reactivated for seven per cent, and was not reported for six per cent.

**FIGURE 1**

NOTIFICATIONS OF TUBERCULOSIS, 1929-2000, NSW, WITH DATE OF SELECTED POLICY CHANGES HIGHLIGHTED



STM = streptomycin therapy introduced	BCG = BCG vaccinations administered
INH = isoniazid therapy introduced	CXR = chest x-ray
RIF = rifampicin therapy introduced	RX = therapy
MTX = Mantoux test done	

**TABLE 1****PATIENTS NOTIFIED AND HOSPITALISED, AND THOSE PATIENTS WHO DIED WITH TUBERCULOSIS, NSW, 1991–2000**

Case characteristics	Notified cases	Rate/100,000	Hospital admissions (% of cases)	Notified deaths (% of cases)
<b>Year of onset</b>				
1991	430	7.3	63 (15)	9 (2)
1992	394	6.6	143 (36)	20 (5)
1993	389	6.5	216 (56)	28 (7)
1994	394	6.5	205 (52)	24 (6)
1995	443	7.2	225 (51)	22 (5)
1996	410	6.6	191 (47)	16 (4)
1997	422	6.7	227 (54)	16 (4)
1998	383	6.0	204 (53)	27 (7)
1999	483	7.5	227 (47)	25 (5)
2000	433	6.7	210 (48)	39 (9)
<b>Total</b>	<b>4181</b>	<b>6.8</b>	<b>1911 (46)</b>	<b>226 (5)</b>

**TABLE 2****CHARACTERISTICS OF PATIENTS NOTIFIED AS HAVING TUBERCULOSIS, NSW, 1991–2000**

Case characteristics	Cases 1991–2000 (% total)	Cases in 2000 (% total)	Rate/100,000 In 2000
<b>Total</b>	<b>4181 (100)</b>	<b>433 (100)</b>	
<b>Residence</b>			
Sydney area	3523 (84)	389 (90)	10.6
Other NSW	615 (15)	43 (10)	1.6
Overseas/unknown	43 (1)	1 (<1)	
<b>Sex</b>			
Male	2198 (53)	215 (50)	6.7
Female	1971 (47)	218 (50)	6.7
<b>Age group</b>			
<5	144 (3)	14 (3)	3.3
5–9	57 (1)	2 (<1)	0.4
10–14	47 (1)	1 (<1)	0.2
15–19	119 (3)	4 (1)	0.9
20–24	334 (8)	44 (10)	9.9
25–44	1593 (38)	169 (39)	8.6
45–64	857 (20)	98 (23)	6.7
65+	1030 (25)	101 (23)	12.2
<b>Aboriginal or Torres Strait Islander</b>	34 (<1)	6 (1)	5.1
<b>Region of birth (1995–2000)</b>			
Australia	620 (18)	72 (17)	1.4
Europe	370 (11)	29 (7)	4.0
Asia	1944 (58)	278 (64)	60.1
Middle East	60 (2)	12 (3)	11.3
Africa	79 (2)	10 (2)	13.5
Oceania	129 (4)	21 (5)	13.5
Americas	38 (1)	6 (1)	6.8
Not reported	117 (3)	5 (1)	
<b>(Total)</b>	<b>3357 (100)</b>	<b>433 (100)</b>	<b>6.7</b>

**TABLE 3****CLINICAL CHARACTERISTICS OF PATIENTS NOTIFIED AS HAVING TUBERCULOSIS, NSW, 1991–2000**

Case characteristics	Cases 1991–2000 (% total)	Cases in 2000 (% total)
<b>Total</b>	<b>4181 (100)</b>	<b>433 (100)</b>
<b>Main site</b>		
Lung	2111 (50)	251 (58)
Lymphatics	546 (13)	70 (16)
Pleura	160 (4)	37 (9)
Kidney–genito-urinary	117 (3)	5 (1)
Bone–joint	106 (3)	12 (3)
Gastro-intestinal	48 (1)	5 (1)
Central nervous system	41 (1)	6 (1)
Other	193 (5)	17 (4)
Not reported	859 (21)	30 (7)
<b>Case classification</b>		
New diagnosis	3135 (75)	376 (87)
Reactivation	230 (6)	29 (7)
Not reported	816 (20)	28 (6)
<b>Laboratory confirmed</b>		
<b>Pulmonary cases only</b>	2967 (71)	339 (78)
	2164 (100)	254 (100)
<b>Direct smear positive</b>		
Yes	711 (33)	99 (39)
No	730 (34)	114 (45)
Not reported	723 (33)	41 (16)
<b>Culture positive</b>		
Yes	1004 (46)	142 (56)
No	437 (20)	71 (28)
Not reported	723 (33)	41 (16)

Over three quarters (78 per cent) of all cases were reported to have been confirmed by laboratory tests (Table 2).

**Sputum**

In 2000, 254 cases were reported to have pulmonary disease. Of these, sputum microscopy results were reported for 84 per cent. Of the 254 cases, acid fast bacilli (AFBs) were identified in 39 per cent on direct sputum smears, and 56 per cent were reported to have *M. tuberculosis* cultured in the sputum.

**HIV co-infection**

For 1991–2000, HIV co-infection was reported in 63 patients, including eight patients in 2000. Tuberculosis is one of 26 illnesses that, when combined with HIV infection, defines the Acquired Immune Deficiency Syndrome.

**Drug resistance**

For cases notified in 2000, drug sensitivities were reported incompletely. Twenty-four patients were reported to have organisms resistant to isoniazid, three patients had organisms resistant to pyrazinamine, and six patients had organisms resistant to rifampicin. There were six patients

with multi-drug resistant tuberculosis (with resistance to at least isoniazid and rifampicin). These patients ranged in age from 22 to 73 years, and half were male. Five were born in Asia, and one was born in the Pacific Islands. One patient had tuberculosis that was resistant to isoniazid and rifampicin alone, three had tuberculosis that was resistant to isoniazid, rifampicin, and rifabutin, and two had tuberculosis resistant to these and other drugs. The management of these cases was reviewed by the state Multi Drug Resistant Tuberculosis Advisory Committee.

**Hospitalisations and deaths**

Of the 433 cases of tuberculosis notified in 2000, just under half were hospitalised (Table 1). In the same year, 39 patients (nine per cent) died, although not necessarily of tuberculosis. Two thirds of the patients who died were 70 years of age or older. For the decade 1991–2000, 46 per cent of patients were reported to have been hospitalised, and five per cent were reported to have died.

**DISCUSSION**

The incidence of tuberculosis in NSW has remained steady for the last two decades. On one hand this is frustrating, in that NSW has been unable to sustain the rate of decline of the disease established in the 1950s and 1960s. On the other hand it is reassuring, because it reflects a modest decline in the local transmission of the disease given the proportional increase in cases among people who have lived in high prevalence countries.

These data are limited by incomplete reporting of some types of information, notably drug resistance patterns and sputum results. In an effort to improve the reporting of these data, the NSW Department of Health will introduce a new data checking system in 2002, whereby the area health services will be asked to forward hard copies of notifications and test results to the Communicable Diseases Surveillance and Control Unit for review.

The surveillance, treatment, and prevention of tuberculosis still challenges public health professionals around the world. The control of tuberculosis depends on effective collaboration among general practitioners and specialist doctors, laboratories, chest clinic staff, public health units, the NSW Department of Health, and affected patients and communities.

**ACKNOWLEDGEMENTS**

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**REFERENCE**

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