Tuberculosis notifications in Australia, 2003

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Abstract

The National Notifiable Disease Surveillance System (NNDSS) received 982 tuberculosis (TB) notifications in 2003, of which 947 were new cases, 33 were relapses and two were cases with unknown history. The incidence of TB in Australia has remained at a stable rate since 1985 and was 4.9 cases per 100,000 population in 2003. The high-incidence groups remain people born overseas and Indigenous Australians at 19.9 and 8.7 cases per 100,000 population, respectively. By contrast the incidence in non-Indigenous Australians was 0.9 per 100,000. Comparison of the 2003 TB notification data against the performance indicators set by National Tuberculosis Advisory Committee highlights that enhanced TB control measures should be considered among these high-risk groups. *Commun Dis Intell* 2004;28:464–473.

Keywords: tuberculosis, surveillance

Introduction

Tuberculosis (TB) control in Australia confronts a paradox. Australia has one of the lowest incidence rates of TB in the world and these rates have remained stable at 5–6 cases per 100,000 population since the mid-1980s.[1] Tuberculosis programs in low-incidence countries face problems in maintaining treatment services (including specially-trained staff, drug supplies and funding) for patients with active TB disease, in providing screening and preventative treatment programs for latent tuberculosis infection (LTBI) among high-risk groups, and in realigning

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policies and procedures towards TB elimination.[2] On the other hand, approximately 60% of the 8.8 million TB cases occurring globally in 2002 live in Australia's neighbouring countries in South-East Asia and the Western Pacific.[3] Those born overseas have accounted for an increasing proportion of Australia's burden over the last decade.[1] Australia's migrant intake includes people from countries with high prevalence of TB.

One crucial step in maintaining TB control in a low-incidence country is the collection of accurate, comprehensive and timely statistics. This data must be compared against performance indicators to ensure that strategic directions are identified, that outcomes are achieved, and that Australia's enviable record of TB control is maintained. This paper presents the TB notification data from the National Notifiable Diseases Surveillance System (NNDSS) in 2003. The data is also compared against the National Tuberculosis Performance Indicators (NTPI) set by the National TB Advisory Committee (NTAC) in the *National Strategic Plan for TB Control in Australia Beyond 2000*.[4] Information about drug susceptibility is published by the Australian Mycobacterium Laboratory Reference Network in an accompanying report.

Methods

Data collection

TB is a notifiable disease in Australia. Medical practitioners, public health laboratories and other health professionals are legally required to report cases of TB to the State and Territory health authority. Information on notified cases for 2003 was collated by jurisdictions and sent electronically to the Australian Government Department of Health and Ageing. Records were dispatched in a de-identified format to ensure confidentiality. The National Tuberculosis Advisory Committee (NTAC), as a subcommittee of Communicable Diseases Australia Network (CDNA), was responsible for determining the data set collected in 2003 and for its transmission to NNDSS. Data fields in the enhanced TB data set that were analysed in this report were listed in Table 1 with a brief description of each variable.

Data processing and quality control

Data on all TB notifications reported in 2003 were received by September 2004. Data received from the jurisdictions was examined for completeness and accuracy. Any invalid or missing entries were returned to the jurisdictions for review and correction.

Most cases of TB in Australia are reported to the surveillance system[5]. Reasons for the high level of reporting include the presence of effective TB screening programs, a high standard of health care, and specialised and multi-disciplinary TB services in each jurisdiction. The terms 'notification rate' and 'incidence' are therefore used interchangeably in this report.

Case definitions

TB cases were classified as new or relapsed. A new case required a diagnosis accepted by the Director of TB Control (or equivalent) in the relevant jurisdiction, based on laboratory or clinical evidence, and in the absence of any previous treated or untreated TB diagnosis. Laboratory evidence includes either the isolation of *Mycobacterium tuberculosis* complex (*M. tuberculosis, M. bovis or M. africanum)* from a clinical specimen by culture; or nucleic acid testing indicating *M. tuberculosis* complex except where it is likely to be due to previously treated or inactive disease. The inclusion of NAAT in this definition is to ensure full case ascertainment and does not endorse NAAT for TB diagnosis. Microscopy and culture remain the mainstays of TB laboratory diagnosis and provide the capacity for assessing level of risk for transmission and drug susceptibility testing.

Clinical evidence is a diagnosis made by a clinician experienced in tuberculosis and includes clinical follow-up assessment, with or without supporting radiology.

A relapsed TB case was defined as a case of active TB diagnosed bacteriologically, radiologically or clinically, having been considered inactive or quiescent following previous treatment (as deemed by the State or Territory Director of Tuberculosis). Relapses refer to re-treatment cases and some of these may be reinfections rather than a true relapse of prior disease.

Population estimates for 2003

The rates presented in this report were calculated using population data produced by the Australian Bureau of Statistics (ABS). The estimated resident population (ABS, 2003)[6] as at 30 June 2003, in each state and territory and in Australia as a whole, was used as the denominator in crude rate calculations.

Estimates of the Indigenous Australian population were based on projections from the 2001 census[7] estimate of the Indigenous population in Australia (ABS, 2001). The ABS calculated the projections based on assumptions about future births, deaths and migrations in the Indigenous population and a 'low' and 'high' estimate were provided. For the

Table 1. Description of some of the data fields in the enhanced tuberculosis data set of the National Notifiable Disease Surveillance System*

Data field	Description
Country of birth	Country in which the notified case was born
Extrapulmonary site	Details of any extrapulmonary site involved
New or relapse case	Options include: New case (without known previous treatment), Relapse of disease following full treatment in Australia, Relapse of disease following partial treatment in Australia, Relapse of disease following full treatment overseas Relapse of disease following partial treatment overseas
TB Outcomes	Options include: Cured (bacteriologically confirmed), Completed treatment, Interrupted treatment for less than 2 months (but still completed), Died of TB during treatment phase, Died of other cause during treatment phase, Defaulter (failed to complete treatment), Treatment failure (completed treatment but failed to be cured), Transferred out of Australia during treatment phase
Age	Age of notified case at diagnosis
Indigenous status	Whether notified case is self-identified Indigenous (Aboriginal and/or Torres Strait Islander) Australian or not
Selected risk factors	Options include: Close contact with a TB patient, Currently/recently residing in a correctional facility, Currently/recently residing in an aged care facility, Currently/previously employed in an institution, Currently/previously employed in the health industry, HIV status (positive or negative) Past residence (3 months or more) in a high risk country

* Other data collected on each case included diagnosis details, therapy & susceptibility. These were analysed in the accompanying TB lab report.

purpose of this report, the 'low' estimate has been used, which is consistent with previous annual reports for TB notifications in Australia.

The 2001 census data were used to calculate incidence rates of TB in people born overseas. The estimated resident population of overseas-born people (total and by country of birth) in 2001 was used as the denominator in calculating rates.

To estimate the non-Indigenous Australian-born population, the Indigenous population estimate and the overseas-born population estimate were subtracted from the total Australian population. Since some of the TB notifications in the report may include non-permanent residents of Australia in 2003, the rates may be overestimated.

Results

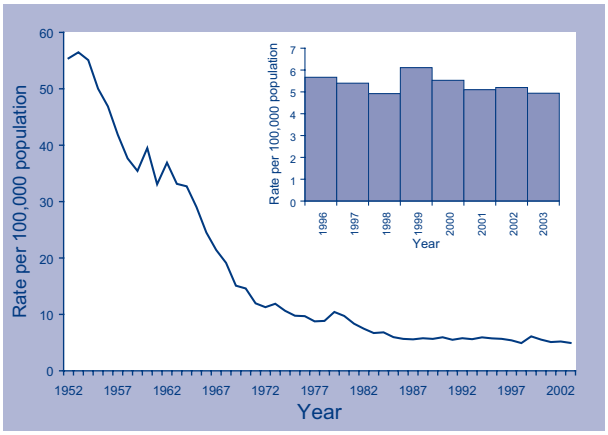
Data quality

The majority of data fields were well reported. Information on age and sex for all notifications were complete. Country of birth was recorded for 980 (99.8%) of the total TB notifications. Indigenous status was reported for 159 (94.6%) of the 168 people born in Australia. The site(s) of TB disease were reported for 980 cases and whether the case being new or relapse was also reported for 980 cases. Therefore, the total for analysis was 980. Overall reporting of risk factors for TB improved for this period with 82 per cent complete compared with 48.7 per cent complete in 2002. The outcome from treatment was reported for 756 (77%) of cases. HIV status was not well reported (32.2%).

TB notification rates

The total number of cases reported across Australia in 2003 was 982 (4.9 cases per 100,000 population) compared with 1,028 cases (5.2 cases per 100,000 population) in 2002. The national rate has remained relatively stable since 1985 except for an increase in 1999 due to the large number of TB cases identified in the East Timorese population evacuated to Darwin (Figure 1).

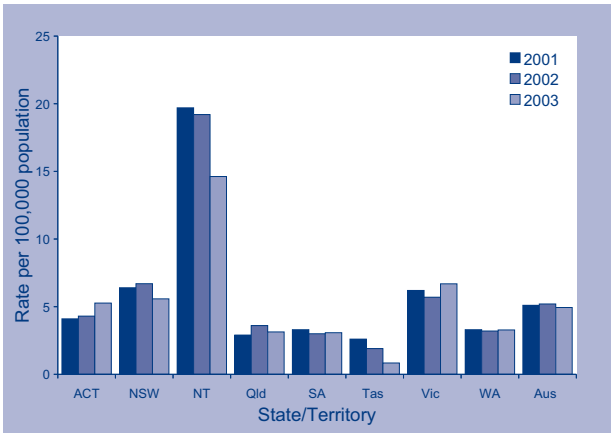
Figure 1. Incidence rates for TB notifications, Australia, 1952 to 2003



TB notifications by jurisdiction

New South Wales reported the largest number of TB cases however the highest rate was recorded in the Northern Territory (Table 2). Figure 2 presents the notification rates by jurisdiction for 2001–2003. The small increases and decreases over time are often difficult to interpret due to the small number of cases within jurisdictions.

Figure 2. TB notification rates by jurisdiction, Australia, 2001 to 2003



Of the 33 relapsed cases, 14 were identified following full treatment in Australia, one following partial treatment in Australia, 12 following full treatment overseas and six following partial treatment overseas.

TB notifications in the Australian-born population

In 2003, the Indigenous status of nine cases was unknown and these cases were added to the non-Indigenous Australian-born category for the calculations of rates (Table 3). One hundred sixty-eight (17%) cases of TB occurred in the Australian-born population, of whom 130 (77%) were non-Indigenous and 38 (23%) were Indigenous Australian.

The TB incidence rate in the non-Indigenous Australian-born population (0.9 cases per 100,000 population) has remained stable over the past 12 years. The incidence of TB in Indigenous Australians for 2003 was 8.7 cases per 100,000 population, the

Table 2. New and relapsed cases and rates per 100,000 population by jurisdiction, Australia, 2003*

State/territory	New cases	New cases rate	Relapsed cases	Relapsed cases rate	Total	Total rate
Australian Capital Territory	17	5.3	0	0.0	17	5.3
New South Wales	363	5.4	10	0.1	373	5.6
Northern Territory	26	13.1	3	1.5	29	14.6
Queensland	114	3.0	5	0.1	119	3.1
South Australia	46	3.0	1	0.1	47	3.1
Tasmania	3	0.6	1	0.2	4	0.8
Victoria	321	6.5	6	0.1	327	6.6
Western Australia	57	2.9	7	0.4	64	3.3
Australia	947	4.8	33	0.1	980	4.9

* There were two cases where relapse status was unknown.

Table 3. TB notifications and incidence rates in all Australian-born by jurisdiction, Australia 2003

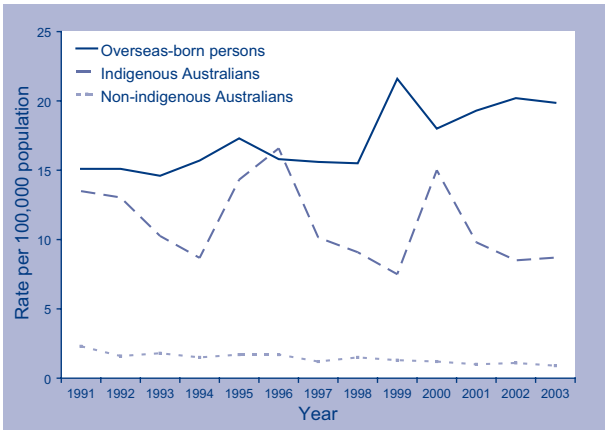
State/territory	Indigenous Australian-born	Rate	Non-Indigenous Australian-born	Rate	Total Australian-born	Rate
Australian Capital Territory	0	0.0	5	2.0	5	1.9
New South Wales	5	4.1	43	0.8	48	0.9
Northern Territory	20	34.9	2	1.8	22	12.9
Queensland	6	4.9	25	0.8	31	1.0
South Australia	2	8.1	10	0.8	12	1.0
Tasmania	0	0.0	2	0.5	2	0.5
Victoria	0	0.0	39	1.0	39	1.0
Western Australia	5	8.0	4	0.3	9	0.6
Australia	38	8.7	130	0.9	168	1.1

second lowest rate reported for this population since 1991. However, the TB incidence among Indigenous Australians remains almost ten times higher than among non-Indigenous Australian-born people. Twenty of 38 cases in Indigenous Australians were also reported from the Northern Territory, a jurisdiction where 28 per cent of the population are Indigenous Australians as compared to two per cent nation wide.

TB notifications in the overseas-born population

The rate of notification in the overseas-born was 19.9 cases per 100,000 population in 2003, which is similar to the previous two years (20.2 and 19.3 cases per 100,000 population in 2002 and 2001, respectively) (Figure 3). Overseas-born population have represented an increasing proportion of new TB cases over the last decade; 637 (66.4%) of 960 incident cases in 1994 compared with 812 (82.7%) of 982 TB notifications in 2003.

Figure 3. TB incidence rates by Indigenous status and country of birth, Australia 1991 to 2003



TB notifications by age and sex

One of the most important measures of TB control is the incidence in children less than 15 years of age because these cases are markers of recent TB transmission. TB was notified in 43 children under 15 years of age and the overall notification rate for this age group was 1.1 case per 100,000 population (target less than 0.1 per 100,000 population for all groups). The rate was highest in overseas-born children, and high in Indigenous Australian-born children (Table 5). The rate of 0.4 per 100,000 population in non-Indigenous Australian-born children remains low, close to the target of the National Performance Indicators of TB (<0.1 per 100,000 population).

The age and sex-stratified incidence rates for TB in overseas-born, Indigenous Australian-born and non-Indigenous Australian-born populations are shown in Figure 4. The TB distribution pattern in the overseas-born population was different to that of the Australian-born population. In the non-Indigenous Australian-born there was approximately one case per 100,000 population for people up to the 45–54 year age range for both males and females, after which the incidence rate increased gradually for both sexes. The highest rates for the non-Indigenous Australian-born population was in the over 65 year age group, where the rate for males was 4.9 cases per 100,000 population and 2.4 cases per 100,000 population for females. The overall male:female ratio in non-Indigenous Australian-born TB cases was 1.4:1.

Age-specific peaks in TB incidence are evident among overseas-born population (i.e. among infants 0–4 years, among young adults in the 15–34 year age groups, and in those aged over 65 years) (Figure 4). Similar but smaller peaks are discernible in the age-specific incidence rates for the Indigenous Australian-born population. The overall male: female ratio of TB cases in the overseas-born population was 1:1. The overall male: female ratio of TB in the Indigenous Australian-born population was 0.7:1.

Table 4. Notification of tuberculosis and estimated rate per 100,000 population for selected countries of birth, Australia, 2003

Country of birth	New cases	Relapsed cases	Total cases	Estimated Australian resident population by country of birth, 2001	Rate per 100,000 population in Australia by country of birth, 2002*	WHO incidence rate per 100,000 population for country, 2001†
Viet Nam	106	5	111	154,833	71.7	192
India	58	1	59	95,455	61.8	168
China‡	50	5	55	142,778	38.5	113
Morocco‖	46	0	46	1,169	§	114
Mongolia	41	1	42	126	§	209
Philippines	32	0	32	103,942	30.8	320
Sudan	24	0	24	4,900	489.8	217
Somalia	22	0	22	3,713	592.5	405
Cambodia	20	2	22	22,979	95.7	549
Libya	22	0	22	1,442	1,525.7	21
Hong Kong (SAR)	18	0	18	67,121	26.8	93
Indonesia	17	0	17	47,156	36.1	256
Papua New Guinea	15	2	17	23,618	72.0	254
Italy	16	0	16	218,718	7.3	8
Others	301	9	310	3,201,141		
Overseas	786	26	812	4,087,928	19.9	
Australia	160	8	168	15,619,272	1.1	
Not stated			2			
Total	946	34	982	19,707,200	5.0	

* Country of birth for denominator is from the 2001 census.

† Rates from the World Health Organization 2004 Global tuberculosis report.

‡ China excludes Hong Kong SAR and Taiwan.

§ Crude rate for people born in Morocco and Mongolia were not estimated as their population estimates in 2001 was small. A small increase in the number of cases could sharply increase the crude rate that does not necessarily reflect the magnitude of the true increase.

‖ Morocco includes people who were born in Western Sahara.

Note: There were two cases where relapse status was unknown.

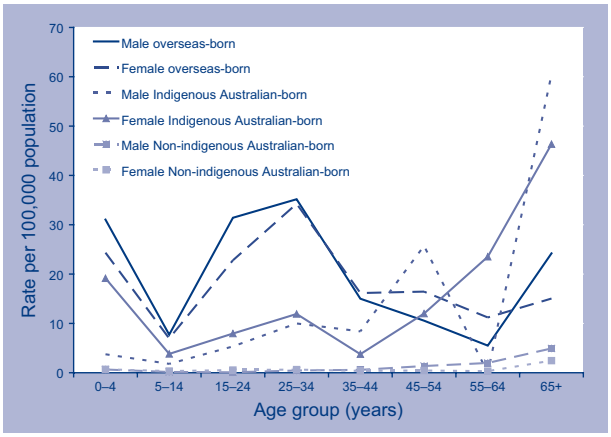
Table 5. TB notifications and estimated incidence rate by age group, Indigenous status and country of birth, Australia, 2003

Age group	Indigenous Australian-born		Non-Indigenous Australian-born		Overseas-born	
	n	Rate	n	Rate	n	Rate
0–4	6	11.4	8	0.7	7	27.8
5–14	3	2.8	6	0.2	13	7.3
Sub total for <15 years	9	5.6	14	0.4	20	9.9
15–24	5	6.6	7	0.3	107	27.2
25–34	7	11.0	12	0.5	210	34.7
35–44	3	5.9	10	0.5	135	15.6
45–54	6	18.6	16	0.9	118	13.5
55–64	2	12.4	14	1.1	57	8.2
65+	6	52.5	57	3.5	165	19.5

Note: The denominator used for total non-Indigenous Australian-born population is from the 2001 census, whilst age group breakdowns use denominators from estimated resident population in 2000 based on the 1996 census results.

There were two cases where country of birth was unknown and nine cases where indigenous status was unknown.

Figure 4. TB incidence in Australian-born and overseas-born by age and sex, 2003



Note: There were two cases where country of birth was unknown.

TB and selected risk factors

Information on risk factors for TB disease excluding HIV were reported for 492 (50%) of the 982 cases. Caution must be taken in interpreting these results as it is unclear whether there were no risk factors identified in the other TB notifications or if the information was not recorded. Where risk factors were reported, the majority (433 cases) identified as having previously resided for three or more months in high risk countries as defined by the Department of Immigration, Multicultural and Indigenous Affairs (DIMIA). Among these 433 cases, seven were Australian-born and 426 were overseas-born. An additional 174 cases were household members or close contacts of TB cases, seven cases either resided or had recently resided in a correctional service and nine cases either resided or recently resided in an aged care facility. For individuals working in high risk settings, four cases were employed or recently employed in institutions such as correctional facilities or aged care facilities and 30 cases were employed or recently employed in the health industries. Among these 30 cases, three were Australian-born and 27 were overseas-born.

TB and HIV status

Information on HIV status was reported in only one-third of cases. Twelve people were identified with HIV infection at the time of diagnosis with TB; five Australian-born and seven overseas-born. The National Strategic Plan recommends that HIV status of all TB cases be reported. The reporting of HIV status has not improved appreciably since 2002 when only 27 per cent cases had HIV status reported.

Anatomical site of disease

Five hundred sixty-three (57%) of notified cases had pulmonary disease either alone or accompanying disease at an extrapulmonary site; 417 cases (43%) had TB limited to an extrapulmonary site only. The sites of disease in new and relapse cases are shown in Table 6. Pulmonary TB was most commonly reported in the Australian-born populations (73.8%) and less commonly in the overseas-born (54.1%). More cases in 2003 reported lymph nodes as the site of infection (16% in 2002; 24% in 2003).

Treatment outcomes

Treatment outcomes were reported for 756 (77%) of the cases from 2003 by September 2004. The remaining individuals were either still undergoing treatment or their treatment status was unknown. Satisfactory outcomes were reported for 87.3%, including those with bacteriologically confirmed cure and those who completed treatment without bacteriological evidence of cure (Table 7). There were no treatment failures recorded. Eleven cases (1.5%) were reported as defaulting treatment. The proportion of cases cured or who completed treatment were 96.6% among Indigenous Australians, 90.4% among non-Indigneous Australian born and 86.4% among overseas born. Death from TB is rare in Australia. While there were 53 reported deaths in the notified cases from 2003, only 11 were reported to be due to TB with a case fatality rate of 1.1 per cent. A number of these cases were identified at post-mortem.

The following treatment outcomes were excluded from the analysis: deaths (53), cases transferred out of Australia (63), cases with unknown outcome (19), and cases still undergoing treatment at the time report (130).

National Performance Indicators

The National Tuberculosis Performance Indicators (NTPI) were set by NTAC in 2002 and reviewed in 2003 (Table 8). As in last year's TB annual report, the performance criteria for people born overseas applies to people who have been living in Australia for more than five years. Of the 812 cases born overseas, 416 (51.2%) had been living in Australia for more than five years. The TB incidence rate for people born overseas who have been living in Australia for more than five years was 10.2 cases per 100,000 population.

The incidence of TB in children less than 15 years of age in the Indigenous population increased from the previous year (5.6 cases per 100,000 in 2003 and

Table 6. New and relapsed TB cases by site of disease, Australia, 2003

Site	New cases	Relapse cases	Total cases	Percent of cases
Pulmonary only	461	22	483	49.2
Pulmonary and other sites	77	3	80	8.1
Extrapulmonary	409	8	417	42.5
Lymph Nodes	235	1	236	24.0
Other	87	5	92	9.4
Pleural	63	3	66	6.7
Bone/Joint	36	1	37	3.8
Genito/Urinary	30	0	30	3.1
Milliary	16	0	16	1.6
Meningeal	14	1	15	1.5
Peritoneal	14	0	14	1.4

Note: Only the first three categories of site that add up to 980 (99.8% of cases).

For the subsequent categories, they were included in either pulmonary & other sites or extrapulmonary site.

Table 7. Outcomes of TB treatment by population group, Australia, 2003

Treatment outcomes	Indigenous Australian-born	Non-Indigenous Australian-born	Overseas-born	Unknown	Total	Percent of cases
Cured (bacteriologically confirmed)	18	12	39	0	69	9.6%
Completed treatment	10	73	474	0	557	77.7%
Interrupted treatment*	0	0	3	0	3	0.4%
Defaulted§	1	1	9	0	11	1.5%
Failed‖	0	0	0	0	0	0.0%
Missing	0	8	69	0	77	10.7%
Total	29	94	594	0	717	100.0%

* Interrupted treatment means treatment interrupted for two months or more but completed.

† Defaulted means failed to complete treatment.

‡ Failed means treatment completed but failed to be cured.

Note: The following treatment outcomes were excluded from the analysis: deaths (53), cases transferred out of Australia (63), outcome unknown (19) and cases still undergoing treatment at the time of report (130).

4.3 cases per 100,000 population in 2002), but this represented only two additional cases in this age group in 2003.

Discussion

The incidence of TB in Australia has remained between five and six cases per 100,000 population since the mid-1980s, and represents one of the lowest incidence rates in the world.[3] Other developed countries that have reported rates of less than six per 100,000 in 2002 include Iceland, Sweden, and United States of America. Tuberculosis control in low-incidence countries faces specific problems and challenges,[2] such as: the reduced awareness of TB among healthcare professionals, the increasing importance of imported TB among migrants, the recognition of sub-groups at high risk of TB (e.g. Indigenous Australians).

Doctors and other healthcare professionals in Australia must maintain an index of suspicion for TB. The demographic data presented in this paper highlights that doctors and other healthcare workers (HCWs) must "Think TB" particularly when caring for migrants, Indigenous Australians, and elderly non-Indigenous Australian-born patients (Figure 4 and Table 5). This awareness of TB among healthcare professionals depends on adequate undergraduate and postgraduate training in TB epidemiology, diagnosis, management and control measures for doctors, nurses, laboratory staff and migrant health workers.

Table 8. National tuberculosis performance indicators, performance criteria and the current status of tuberculosis in Australia, 2003

National TB Performance Indicator	Performance criteria	2002	2003
Annual Incidence of TB (per 100,000 population)			
Crude incidence			
Indigenous Australians	<1	8.5	8.7
Non-indigenous Australian-born	<1	1.1	0.9
Overseas-born persons*	†	11.5	10.2
Relapse cases initially treated in Australia	<2% of total treated cases	2.3	1.1
Incidence in children <15 years, by risk group			
Indigenous Australian children	<0.1	4.3	5.6
Non-indigenous Australian-born children	<0.1	0.5	0.4
Overseas-born children*	†	7.6	9.9
Collection of HIV status in TB cases (% of cases with data collected)	100% over next 3 years	27.3	32.2
Treatment outcome measures (%)		**(%)**	**(%)**
Cases evaluated for outcomes‡	100	78	89.3
Cases that have treatment completed and are cured	>90	80	87.3
Cases recorded as treatment failures‡	<2	0.1	0

* The performance criteria for overseas born are applied to people who have been living in Australia for more than 5 years. The denominator for this rate is the total overseas born population living in Australia in 2002.

† Performance criteria currently under review.

‡ The denominator used for both 2001 and 2002 was the number of cases evaluated for treatment outcome.

The overseas-born population represented an increasing proportion of new TB cases. This group are at high risk of TB for numerous reasons. Overseas-born people may come from countries with a high incidence of TB and are likely to have acquired latent infection prior to migration. Many are refugees who have been living in camps where overcrowding, poor sanitation and malnutrition increase their risk of progressing to active disease. Finally, resettlement conditions may be socio-economically stressful to migrants, which may contribute to the progression of latent TB to active TB. Social contact with other migrants from high incidence countries may also increase the risk of exposure to TB.

Australian TB services continue to support pre-migration screening for active TB and to participate in post-migration follow-up programs in cooperation with DIMIA and other organisations. Migrants must have ready access to cost-free, non-threatening and culturally-appropriate TB assessment and treatment. People from Morocco, Mongolia, Sudan and Libya were reported as high-incidence sub-populations in Australia for the first time in 2003, reflecting another change in the composition of Australia's migrant intake. Tuberculosis clinics are producing educational materials in additional languages and are adapting to the specific cultural and social needs of these new patient populations. Community leaders in the new migrant populations must also be identified and encouraged to assist with TB control efforts. These TB control measures have proved successful in other migrant populations and are likely to succeed again. However, as Australia and other low-incidence countries move towards TB elimination, overseas-born population will continue to account for an increasing proportion of incident cases. Additional measures, such as active case finding and increased detection and treatment of LTBI, should be considered in migrant populations with a high incidence of TB.

Similarly, Indigenous Australians are at increased risk of TB with incidence rates nearly ten times higher than among non-Indigenous Australian-born people. This disparity has remained evident for the last decade despite the efforts of TB control programs (Figure 3). Some of the known risk factors that explain the high incidence of TB in the Indigenous Australians are socio-economic disadvantage (reflected in overcrowding), co-morbidities (such as diabetes and renal diseases), smoking, alcohol abuse and poor nutrition.[8] A nihilist would argue that TB cannot be controlled in Aboriginal communities until these causative factors are addressed. However, additional TB control interventions must be attempted in the meantime in collaboration with

Aboriginal health services. Tuberculosis cases tend to be restricted to a small number of Aboriginal communities.[8]

Comparison of the 2003 TB notification data against the NTPI provides some gratifying results, such as the TB incidence in the non-Indigenous Australian-born population (0.9 case per 100,000 population), the incidence among non-Indigenous Australian-born children (0.4 per 100,000 population), the proportion of relapsed cases initially treated in Australia (1.1%), and the proportion of cases recorded as treatment failures (0%)(Table 8). Other performance indicators suggest that further action is required. The NTPI aim for Indigenous communities to have the same low TB incidence as the non-Indigenous Australian-born population. The above paragraph suggested interventions to achieve this goal. The reporting of HIV status for TB cases remains at an unacceptable low level (i.e. 27% in 2002 and 32% in 2003). Studies in the United States show that the rate of TB disease among HIV-infected, tuberculin skin test (TST)-positive persons is approximately 200–800 times higher than the rate of TB for the general population.[9] Despite incomplete reporting, twelve cases of HIV/TB were recognised in Australia in 2003. Australian migrant intake includes people who come from countries where HIV and TB are prevalent. Privacy laws in some states confound efforts to collect information on the HIV status of TB patients. Alternative acceptable strategies must be found to obtain this essential public health information.

One final observation from the 2003 TB notification data deserves comment. Thirty TB cases occurred among HCWs, of whom 27 were overseas-born. Health services in Australia are increasingly reliant upon attracting medical and nursing staff from overseas, including from countries where TB is prevalent. State TB services and staff induction programs should be aware of this trend and ensure that new employees are screened and followed-up appropriately for TB.

In conclusion, easy access to effective TB treatment programs, contact tracing, and provision of health education in appropriate languages remain the essential elements for TB control. Australia also needs to remain alert to the growing global threat of TB and to contribute to TB control efforts in Southeast Asia and the Pacific region.

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