

Tuberculosis Strategy

General Information for Health Care Workers 2001

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Introduction

Australia is relatively fortunate in that, compared to other parts of the world, the incidence of TB is still low.

Key messages that we need to convey to the public are:

- TB is not prevalent in Victoria and Australia. It mainly affects immigrants from countries of high TB incidence. Other at risk groups are immunocompromised individuals, the elderly (Australian born and new immigrants) and those who are socially disadvantaged such as the homeless.
- TB is easily treatable and almost 100 per cent curable. Left untreated, however, it can cause serious illness and even death, and may spread to others in the community.
- By being aware of TB and taking responsible action, we can prevent it becoming a major problem in Australia

The TB Program, Department of Human Services

In Victoria, all cases of TB are treated by physicians in infectious diseases units or respiratory units of hospitals, or by physicians in private practice with experience in the management of tuberculosis. The TB Program is responsible for the public health aspects of TB prevention and control and maintains statewide surveillance of TB. The Program nurses liaise with treating physicians and hospitals in ensuring patient compliance with treatment. They are responsible for appropriate contact investigation in all notified cases of TB.

Clinical Features

TB is an acute or chronic infection caused by the tubercle bacillus, *Mycobacterium tuberculosis* and, rarely, by *Mycobacterium bovis*.

The initial infection usually goes unnoticed with lesions healing, sometimes leaving traces of a calcified Ghon complex. The infection may however progress to pulmonary tuberculosis or, through blood or lymphatic spread to produce miliary, meningeal or other extrapulmonary involvement.

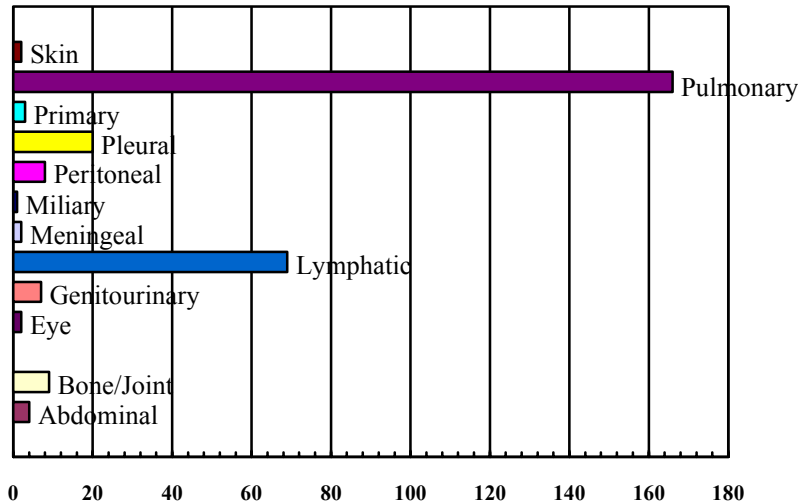
Common symptoms include

- A chronic cough of more than three weeks duration, sometimes accompanied by haemoptysis.

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- Fevers and night sweats.
- Loss of weight, with or without loss of appetite.
- Feeling generally unwell.

Site of Disease 2000



Method of Diagnosis

- Clinical presentation
- Tuberculin skin test, using the Mantoux procedure
- Radiographic examination, sometimes including CT scans
- Bacteriology—direct staining and culture of sputum or other specimens for the presence of *M. Tuberculosis*.
- Molecular amplification (PCR) and gene probes assist in rapid diagnosis.

Definitive diagnosis of TB rests on isolation of *M. Tuberculosis* (or *M. Bovis*) from sputum, urine, biopsy material, CSF or other clinical specimens. A negative sputum however, does not rule out a diagnosis of TB. Recovery and identification of mycobacterium from specimens has been made more rapid with test procedures such as the Bactec systems and DNA probes. Further information on these tests can be obtained from the Mycobacterium Reference Laboratory, VIDRL, Melbourne Health on (03) 9342 2674.

Mode of Transmission

Infection occurs primarily by inhalation of aerosols produced by persons with pulmonary or laryngeal tuberculosis during coughing and sneezing. People in casual contact with infectious patients are at low risk. It is those in continuous close contact such as those living in the same household who are most at risk.

Bovine tuberculosis results mainly from ingestion of unpasteurised milk and dairy products and is uncommon in Australia.

Incubation Period

From infection to the primary lesion, generally about 4–12 weeks

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Period of Communicability

Theoretically, the patient is infectious as long as viable bacilli are being discharged from the sputum. In practice, the greatest risk of transmitting infection is in the period prior to diagnosis of an open case. A sputum smear positive case is more infectious than a culture positive case. The risk of transmitting the infection is significantly reduced within a period that can be from days to two weeks after commencing appropriate chemotherapy.

Special Groups at Risk

- Immigrants and refugees from countries with a high incidence of tuberculosis. These countries include India, China, Vietnam, Philippines and Africa.
- Aboriginal people and Torres Strait Islanders.
- Immunosuppressed patients.
- Those with HIV infection and AIDS.
- The elderly.
- Diabetics.
- Drug and alcohol dependent people.
- Persons living in sub-standard, overcrowded conditions.
- Institutionalised persons, including prisoners.
- Health professionals.

Treatment

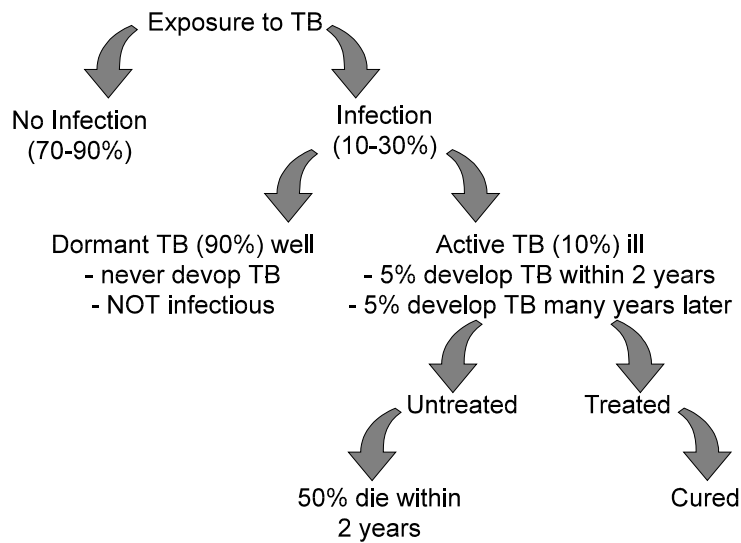
Adequate anti-TB chemotherapy for an appropriate period of time will result in a cure rate of almost 100 per cent. Short treatment regimes have been in use for some years; these involve the use initially of three or four drugs, namely isoniazid, rifampicin, pyrazinamide and possibly ethambutol and continuing with isoniazid and rifampicin for a further four months. Where there is evidence of drug resistance to INH or rifampicin or to both, short course anti-TB chemotherapy is totally inappropriate.

With the introduction of potent anti-TB drugs, hospitalisation of tuberculous patients is no longer mandatory unless social conditions or coexisting medical conditions dictate otherwise. The success of treatment relies heavily on patient compliance and direct supervision should be the aim of any treatment program. Compliance is important to prevent the development of drug resistance. For drugs used in the treatment of tuberculosis refer to *TB in Australia and New Zealand into the 1990s* produced by the Australian Government Publishing Service, Canberra.

Multi-Drug Resistant TB (MDRTB)

Resistance to at least isoniazid and rifampicin (whether or not resistant to other drugs) is classified as multi-drug resistant. MDRTB is rare in Australia, remaining at less than two per cent per year in the past 15 years. There is, however, a potential risk of MDRTB in Victoria as most of the patients notified each year are over seas born from countries with high rates of drug resistance.

The Natural History of TB Infection



Mantoux Test

Hypersensitivity to tuberculin purified protein derivative (PPD) as demonstrated by the Mantoux test, follows after natural infection with *M. Tuberculosis* or BCG vaccination. In the general Victorian population, over 90 per cent of positive Mantoux tests are due to previous BCG vaccination. There are several other *Mycobacteria* besides *M. Tuberculosis* and exposure to any of these environmental *Mycobacteria* can give a positive result.

The Mantoux test is used:

- To detect latent infection in contacts of patients with tuberculosis.
- As a diagnostic aid.
- Prior to vaccination with BCG.

BCG

BCG (Bacille Calmette-Guerin) vaccine is a suspension of live, attenuated *M. Bovis*. The efficacy of BCG in adults is variable; it does not prevent pulmonary tuberculosis and it does not prevent TB infection. In children, it provides a greater degree of protection, especially in preventing the more serious forms of tuberculosis such as meningeal and miliary TB.

The National Health & Medical Research Council (NH&MRC) does not recommend BCG vaccination of the general Australian community where the risk of exposure to TB is low. BCG vaccination is only indicated for specific groups at high risk of TB. In Victoria, BCG vaccination of school children ceased in 1984.

For further information and recommendations refer to:

- Department of Human Services *Management, Control and Prevention of Tuberculosis – Guidelines for Health Care Providers* (1996).
- The *Australian Immunisation Procedures Handbook*, 7th Edition, produced by NH&MRC and available at <http://www.health.gov.au>

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Standards and Control in Relation to BCG Vaccinators

Free BCG vaccine is available only to vaccinators authorised by the TB Program, Department of Human Services. Authorisation is through application to the TB Program. Currently, vaccinator information sessions are held twice a year.

Persons who are authorised vaccinators may order supplies of BCG from the Department of Human Services, PO Box 1670N, Melbourne 3001, telephone: 9637 4144.

Management of Contacts of TB

Notification of TB by clinicians and laboratories is essential in the control of TB and allows identification of contacts to be made. Prompt notification is needed to initiate contact tracing in a timely fashion.

Contact tracing and surveillance is the responsibility of the Department of Human Services and is managed by the Department's TB Program. Anyone identified by health care workers as a contact of TB should be referred to the TB Program on (03) 9637 4115.

Contact Investigation

Contact investigation consists of:

- History taking
- Tuberculin testing
- Radiographic examination when appropriate.

The extent of investigation is governed by the characteristics of the source case. The scope of the investigation is extended when the following factors in the source case are present:

- AFB in sputum smear
- Cavitation on CXR
- Laryngeal TB
- Cough – particularly if productive of sputum

And

- Where there is evidence of tuberculin conversion in any of the close contacts.

Following tuberculin testing, contacts can be grouped as:

- Initial negative reactors
Tuberculin conversion takes a few weeks and may not have occurred yet in these contacts. Testing should be repeated in 8 to 12 weeks after a break of contact or in some cases, initial testing may be delayed for eight weeks.
- Initial positive reactors
Initial positive reactors should be evaluated to exclude active disease. The positive tuberculin test may signify recent tuberculin conversion or an incidental finding.

Contacts identified by the TB Program as requiring further assessment are referred to specialist physicians for exclusion of active disease or consideration of treatment for latent infection.

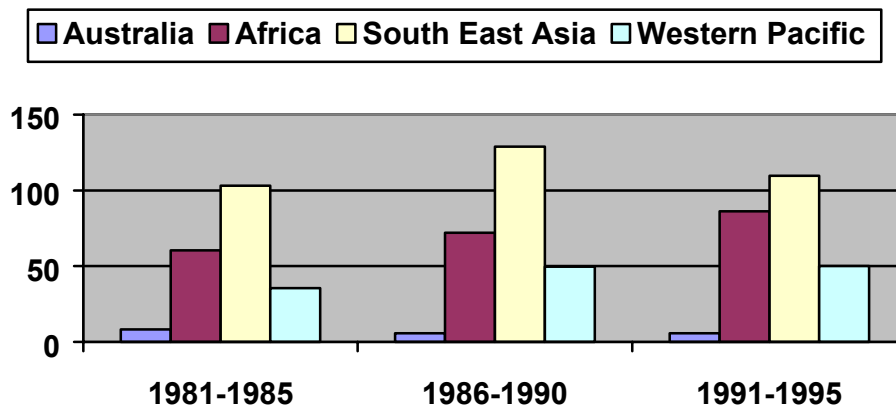
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The Global Situation

Tuberculosis occurs worldwide and had been decreasing steadily over past decades in developed countries. However this pattern has been reversed with the arrival of HIV and increased mobility of the world's population.

The World Health Organisation (WHO), estimated that one-third of the world population (about 1.7 billion people) is infected and globally, tuberculosis accounts for three million deaths annually, with 20 per cent of all deaths in adults in developing countries related to TB. Most of these will be from countries in Africa, Asia and parts of Latin America where TB is endemic and is the major cause of death due to an infectious disease. TB in HIV infected persons is more difficult to manage, runs a more fulminant course and has a high death rate. The WHO estimated that three million people worldwide had both HIV infection and active TB in 1990. HIV testing in several developing countries has shown that as many as 70 per cent of smear positive TB cases are also co-infected with HIV.

Rates in Regions of the World 1981-1995



By global standards, Australia is managing well. The introduction of anti-TB drugs and a concerted public health campaign in the 1950s, as well as improved living standards, had a significant impact on the control of TB. The incidence of TB in Australia is amongst the lowest in the world with an annual incidence rate of around 6 per 100,000 population or between 900 and 1000 new cases each year. However, as two-thirds of the world's population who are infected with tuberculosis reside in Asia, this will have a significant impact on the control of TB in Australia as a result of increased immigration from these areas.

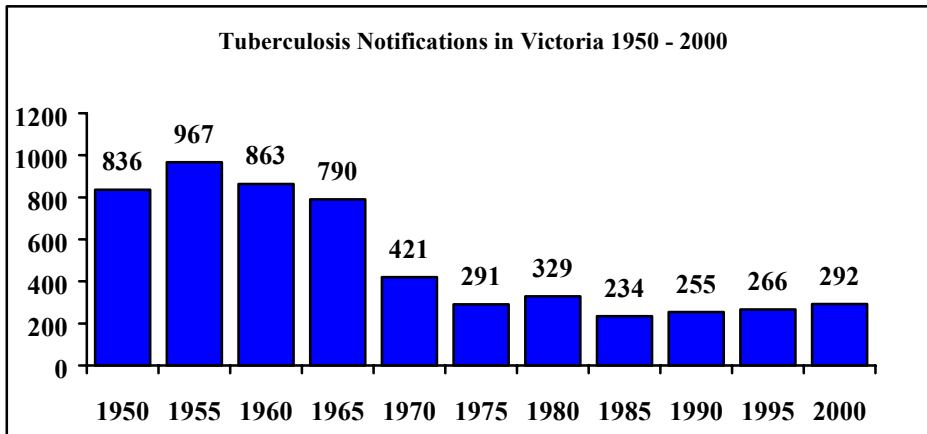
Over the years, the profile of TB in Australia has changed. We only see one to two cases of TB per 100,000 Australian born persons currently, in contrast to 50–100 times more cases in selected groups including people born overseas, aboriginal communities, the homeless and those with HIV infection.

Increased awareness amongst the medical profession with early diagnosis of TB, improved surveillance, screening of high risk groups and ensuring proper treatment of persons with active TB in order to minimise drug resistance, are part of the strategy for the control of TB in Australia.

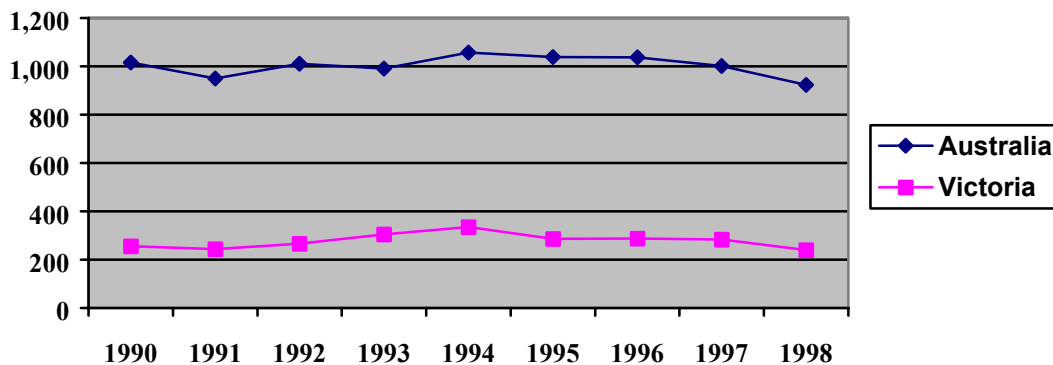
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Epidemiology of TB in Victoria

In Victoria, the incidence of TB has declined since the beginning of the century; cases of TB have dropped dramatically from over 1,000 cases in 1954 to 292 in 2000. However, over the last decade the rate of decline of notifications has reached a plateau, with an incidence rate over the last 5 years fluctuating between a low of 5.1/100,00 in 1998 and a high of 7.0/100,000 in 1999 (average 6.2/100,000).



Victoria & Australia: Number of Notifications

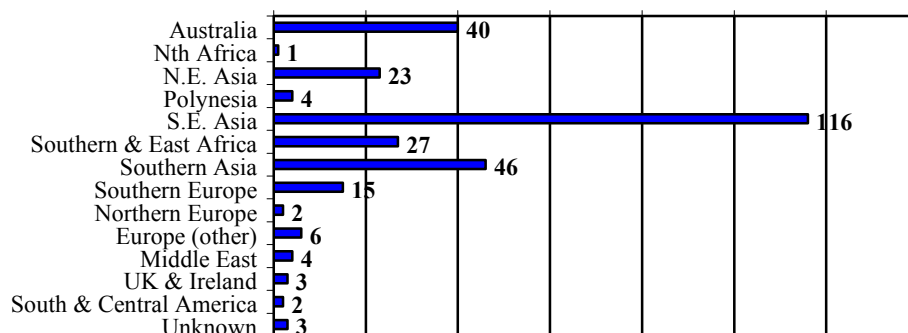


However the epidemiology of TB in Victoria has changed significantly over the past 20 years, with the proportion of notified cases born overseas increasing from 37 per cent in 1970 to 86 per cent in 2000. The highest country-specific notification numbers come from the Vietnamese, Indian, Filipino and African born populations, reflecting the patterns of disease in their countries of birth. The focus of infection has also shifted from the young Australian born to the homeless and the aged. People older than 60 years account for one-quarter of the cases reported.

Of the overseas born patients, almost 50 per cent presented within five years and 30 per cent within two years of their arrival in Australia.

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Victoria, Distribution by Ethnicity 2000



Notification of Tuberculosis

Tuberculosis has been a notifiable disease in Victoria since 1889. Under the Health (Infectious Diseases) Regulations 2001, there is a statutory requirement for doctors who diagnose active tuberculosis and laboratories which isolate *M. Tuberculosis* from a biological specimen, to notify the Department of Human Services in writing, within seven days of confirmation of diagnosis.

Send all notifications to:
Communicable Diseases Section
Reply Paid 65937
Melbourne Vic 8060

Copies of the notification form and information on TB and other diseases are available from the DHS Internet site www.dhs.vic.gov.au/phd/0002003/

More Information

Further information can be obtained from the Tuberculosis Program, Department of Human Services, Communicable Diseases Section, telephone: (03) 9637 4115.

A manual entitled *Management, Control and Prevention of Tuberculosis – Guidelines for Health Care Providers* is available from the Department of Human Services Information Service, telephone: (03) 9637 4184. It contains the following guidelines

- Prevention and treatment of tuberculosis in persons with HIV serology
- Tuberculin testing with guidelines for interpretation in clinical and public health practice
- Standards for contact tracing
- Childhood tuberculosis
- Guidelines for hospital care of active cases
- Childhood tuberculosis
- Tuberculosis in pregnancy
- Prevention of tuberculosis in institutions – nursing homes, prisons
- Preventing tuberculosis infection and disease among health care workers
- Tuberculosis and airline travel
- Migrant screening for tuberculosis
- Guidelines for BCG vaccination.

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Further Reading

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Published by Public Health Division, Victorian Government Department of Human Services

This publication is also available at Internet address: www.dhs.vic.gov.au/phd/tb/hcw.htm

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