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Tuberculosis workforce policy and development framework in Australia

Ellen J Donnan on behalf of the National Tuberculosis Advisory Committee

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Introduction

A specialist workforce is considered essential for a dedicated TB service¹ and has been recognised in the current and previous iterations of the Strategic Plan for Control of Tuberculosis in Australia.^{2,3} Global, national, and local TB Programs vary according to their burden of disease, the geography and size of the jurisdictions and their models of care. There is significant variance in structure and function of state and territory TB programs within Australia.

The *Strategic Plan for Control of Tuberculosis in Australia, 2021–2025* identifies that a skilled, experienced well trained and supported workforce is essential to maintain TB control and to move towards disease elimination.³ The Plan identifies that further development and maintenance of a dedicated skilled workforce is required. This is supported by the World Health Organization's *Towards tuberculosis elimination: an action framework for low-incidence countries*.⁴ Maintenance of a skilled workforce is an issue not unique to Australia, and continues to be an issue in many low incidence countries.⁵ As TB incidence declines, people with the disease are seen less often, and healthcare providers may experience a decrease in proficiency in TB diagnosis, or in familiarity with the latest treatment guidelines, in particular those with complex and/or drug-resistant disease.⁶ Proficiency in laboratory diagnosis skills can also decline with decreasing specimen collection, and maintaining an equipped laboratory manned with skilled staff can be an expensive obligation.

The TB workforce is multidisciplinary and includes medical, nursing, and allied health workers (in the acute, primary health and community sectors), laboratory staff, pharmacists, and program administrators. This multidisciplinary nature of the TB workforce has been recognised as a strength in previous strategic plans.⁷

TB researchers are also another key group in advancing TB management both in Australia and overseas. Given the variety of health professionals involved in the TB workforce in Australia, and the need for workforce planning, development and retention, a multifaceted approach to TB workforce policy is required.

The objectives of this paper are to describe:

1. the roles and key skills of the multidisciplinary TB workforce;
2. the workforce structure of public TB programs in Australia;
3. the workforce priorities;
4. strategies for workforce development; and
5. the roles and responsibilities for training and development within the workforce.

Roles within the multidisciplinary TB workforce

Key health professional disciplines essential for a functioning TB program include: program administrators, nursing, medical, and microbiology. Key skills for these roles are detailed in Table 1.

Table 1: Essential roles and key skills of the TB workforce

Role	References	Key skills
Program administrator	8	<ul style="list-style-type: none"> • Programmatic leadership to achieve goals and outcomes of the national and jurisdictional TB programs • Knowledge and expertise in the clinical and public health management of TB • Understanding and/or analysis of local and global epidemiology • Facilitate and/or develop educational training to build capacity within the jurisdictional TB programs • Understanding of access pathways for TB medications • Policy and practice development, implementation, and evaluation • Advocacy for TB services, clinicians, and patients • Collaborate with other healthcare providers and programmes to achieve individual patient and programmatic outcomes • Understand and comply with jurisdictional legislation and regulations relevant to TB • Responsibility for authorisation of jurisdictional TB data to the Commonwealth and World Health Organization • Service planning, forecasting and budgeting • Understanding, implementation and contribution to operational research
Nursing	8–10	<ul style="list-style-type: none"> • Identification and assessment of at-risk populations and individuals for TB • Case management and implementation of person-centred care/management plan • Patient, family and community education • Clinical management, promotion of adherence strategies for treatment completion, and ongoing monitoring • Medication education, administration and assessment of drug reactions and interactions • Knowledge and application of drug safety monitoring • Interview techniques for patient assessment, undertaking a risk assessment and investigation of contacts • Counselling for people with TB disease, latent TB infection and those potentially exposed to TB • Clinical specimen collection (e.g. sputum expectoration) • Testing for latent TB infection (tuberculin skin testing and interferon gamma release assays), test interpretation, management, referral and education • BCG vaccination

Role	References	Key skills
		<ul style="list-style-type: none"> • Patient advocacy • Implementation of policy and practice for TB infection, prevention and control in healthcare settings • TB transmission mitigation in community settings • Assess and report to inform the programmatic management and public health impact of TB, and evaluate practice against program objectives • Assess TB status and evaluate potential case of TB • Knowledge and understanding of risk factors for TB infection and progression to TB disease • Performance of diagnostic testing: sputum evaluation, bronchoscopy, chest x-ray (CXR), CT scans, biopsies, aspirates and tissue evaluation appropriate to site of disease • Communication of results and education of patients • Understanding of treatment regimens for drug susceptible and drug resistant TB disease • Understanding of treatment regimens for latent TB infection • Medication prescribing • Pharmacovigilance • Assessment of treatment outcomes • Knowledge and application of drug safety monitoring
Medical	—	
		<ul style="list-style-type: none"> • Preparation and reading of specimens by microscopy techniques to detect acid-fast bacilli • Preparation and interpretation of commercial and in-house nucleic acid amplification tests to detect <i>M. tuberculosis</i> complex • Preparation and interpretation of culture methods for <i>M. tuberculosis</i> complex • Thorough understanding and expertise in the biosafety requirements (PC2 or PC3) relevant to the level of mycobacteriology investigations conducted in their laboratory • Provide specialist technical advice on laboratory results and interpretation
Microbiology	11	<p>Specialist skills generally provided by mycobacterial reference laboratories may include:</p> <ul style="list-style-type: none"> • Identification of <i>M. tuberculosis</i> complex to species level • Setup and interpretation of phenotypic drug susceptibility testing • Preparation and interpretation of tests for rapid detection of mutations to critical first- and second-line antibiotics (by line probe assay, sequencing, or another recognised methodology) • Specimen and library preparation and performance of whole genome sequencing

Role	References	Key skills
		<ul style="list-style-type: none"> • Analysis of whole genome sequencing and bioinformatics to interpret genomic sequencing output in collaboration with expert bioinformaticians and with TB contact tracing personnel¹² • Expertise in provision of training in laboratory-based mycobacteriology for client laboratories within the state and/or jurisdiction • Research skills to investigate mycobacterial disease • Mentor skills to support national TB laboratory services in the region
Epidemiology	—	<ul style="list-style-type: none"> • Understanding of the national case definition and National Interoperable Notifiable Disease Surveillance System (NINDSS) data specifications • Collection of data nationally or within jurisdictions to support the World Health Organization data reporting, national and jurisdictional data requirements • Interpretation of whole genome sequencing to review transmission of TB in Australia¹² • Data analyses and reporting to support and direct clinical and public health actions and program monitoring and evaluation

Table 2: Key roles for allied health workforce related to TB

Role	Key skills
Pharmacy	<ul style="list-style-type: none"> • Knowledge of drug access pathways • Therapeutic drug monitoring • Facilitation of access to unregistered therapeutics under the Therapeutic Goods Administration Special Access Scheme¹³
Social work	<ul style="list-style-type: none"> • Psychosocial support of patients in isolation • Supports for homeless patients, immigrants, refugees, asylum seekers, prison populations and patients with drug abuse • Access to financial support payments
Dietetics	<ul style="list-style-type: none"> • Dietary advice and nutritional support to improve patient outcomes
Physiotherapy	<ul style="list-style-type: none"> • Induced sputum collection • Chest physiotherapy • Pulmonary rehabilitation
Aboriginal and Torres Strait Islander Health	<ul style="list-style-type: none"> • Support for Aboriginal and Torres Strait Islander people diagnosed or exposed to TB • Advice on provision of culturally appropriate education and resources for Aboriginal and Torres Strait Islander people and communities • Collaboration with Aboriginal Community Controlled Health Services to promote culturally appropriate treatment plans
Multicultural services	<ul style="list-style-type: none"> • Translation services • Facilitation of access to hard-to-reach migrant groups • Advice on effectively communicating with culturally and linguistically diverse people.

Several allied health disciplines are integral to a comprehensive multidisciplinary approach to TB management. Key knowledge and skills these roles may include, in relation to TB, are shown in Table 2.

The Australian TB workforce

In Australia's federal system of government, communicable disease control, including TB control, is managed through state and territory government based programs, rather than through a centralised national program as seen in most other countries.² The National Tuberculosis Advisory Committee (NTAC) is a sub-committee of the Communicable Diseases Network Australia (CDNA); the role of NTAC is to provide guidance to support a nationally consistent approach to TB control in Australia and to assist activities toward maintaining a high level of knowledge and expertise in Australia with regard to TB.¹⁴ Other national committees relevant to the TB workforce include the Public Health Laboratory Network (PHLN) and the National TB Data Quality Working Group. Other organisations or networks supporting the TB workforce in Australia include the Australian Society of Microbiologists Mycobacterial Special Interest Group; professional bodies such as

the Thoracic Society of Australia and New Zealand and the Australian Society for Infectious Diseases; and the informal TB nurses' network.

State and territory TB programs are varied in their structure and operation as a consequence of their development history and the local and temporal contexts.^{1,15} The role of jurisdictional TB programs is to lead and support the patient care activities by ensuring that standardised, best-practice evidence-based care is provided. Each state and territory may have differing structures to support the clinical and public health aspects of TB, resulting in significant variation in workforce structure and composition. TB programs in all states and territories are undertaken in the public system, through hospitals, community health, and public health services, and have a centralised or decentralised model depending on a variety of factors including patient load, service structures and networks and geography.¹ There is a continuing requirement to share good practice and explore ways to configure services effectively in line with local needs.¹⁶

In Australia, TB is managed by both respiratory and infectious diseases medical specialists. Historical contexts have led to differences between jurisdictions, in regard to which medical specialities manage TB: some states are predominantly managed by respiratory specialists; some by infectious diseases specialists; and others by a combination.¹⁵ Public health physicians also have a role in some jurisdictions, particularly in relation to management of TB prevention and outbreak activities. Inadequate staffing levels amongst physicians, an ageing workforce, and a perceived lack of interest or understanding re TB are common themes in Australia and internationally.^{17,18}

In Australia, nurses comprise the largest proportion of the TB program workforce and have a vital role in leading patient care and public health activities within the TB program. Nurse-led clinics have the ability to free up physicians' time in addition to providing a more patient-focused service.¹⁸ Nurse-led clinics also require strong nursing leaders with skills and experience, and a strong development program for nurses to build up management skills for adequate staffing succession.

An adequate, skilled, motivated and resourced workforce is essential to maintain local control of TB and to progress towards achieving global TB-control targets.¹⁹ Ongoing assessment of staffing needs is required, with mechanisms to scale up workforce in response to changing migration patterns, and for large contact screenings or outbreak management.

A further area of development in the Australian TB response would be upskilling of general practitioners (GPs), to not only recognise TB disease and identify latent TB infection, but to also provide TB preventive therapy for latent TB infection.²⁰

Workforce priorities

Health workforce development for TB is concerned with the different functions involved in planning, managing and supporting the professional development of the health workforce for comprehensive TB management and prevention within overall health workforce development.²¹ The quality-of-service delivery depends, to a large extent, upon adequate numbers of staff and their performance, with performance of personnel dependent on various factors including training and supervision and resources. Challenges exist with capacity strengthening, with supervision and monitoring of service quality on all levels, and with continuous medical education, integrated within wider systems of human resources development that exist within the general healthcare settings under which TB programs operate.²²

Key priorities for recruitment and development of the TB workforce include:

Strengthening program leadership:

- Utilising NTAC to maintain direction and consistency across jurisdictions;
- Establishing the role in TB of the future Australian Centre for Disease Control;
- Support for jurisdictional directors or managers to ensure workforce training and support;

Strengthening the multidisciplinary workforce:

- Exposure to TB across respiratory, infectious diseases and public health medical subspecialities;
- Advanced nursing pathways for Clinical Nurse Specialists, Clinical Nurse Consultants and Nurse Practitioners;
- Engagement with allied health professionals such as psychologists, social workers, dieticians, and pharmacists that can support TB patients and TB-specific challenges, including isolation, nutritional support, social supports particularly for non-Australian residents, and medication interactions and side effects;

Workforce development:

- Targeted professional development and training to improve workforce knowledge and skills;
- Provision of mentoring, supervision, coaching and other support to clinical and non-clinical staff;

Support capacity in partner workforces:

- Education and support to partner workforce groups such as staff health, refugee health service, and general practitioners in high burden areas.

Incorporating or expanding operational and implementation research into Australian TB programs would provide a stronger evidence base for TB prevention activities in Australia; would support TB policy development in low incidence countries; and would contribute to the global End TB Strategy.^{23,24}

Strategies for workforce development

Education and training are essential for sustainable TB control programs.⁶ Training is an important component of TB human resources and workforce development;¹⁹ there is a need to identify the minimum requirements of training, at different service levels, to obtain a universal standard of care for TB patients and to better standardise training materials, methodologies and courses.²⁵ Training should be directed not only to healthcare providers but also to decision makers, especially those who influence health-education curricula, and to the public.⁶

The low incidence of TB in Australia may result in decreasing opportunities for education and training, and in potential for professional disinterest among newly qualified medical practitioners and nurses entering the health system due to a lack of knowledge regarding TB.² Specific strategies and an implementation plan are likely required to overcome the challenges associated with Australia's low incidence status and lack of knowledge within the general health system.

Key strategies and implementation approaches include:²¹

Pre-service training:

- basic training during initial training (e.g. undergraduate) for physicians, nurses, laboratory technicians and other health workers involved in the implementation of TB control;
- general healthcare worker training;

In-service training (clinical, laboratory and managerial) for all health workers involved in TB control:

- orientation including topics such as treatment adherence, drug resistant TB, infection prevention and control and TB-HIV co-infection;
- further training/upskilling in new evidence/developments/policies;
- on-the-job or refresher training (minor performance problems that may be addressed during a supervisory visit);
- continued education (to build skills and knowledge);

Formal post-graduate training:

- advanced physician training;
- specialist post-graduate nursing degree;
- doctoral degree; and
- advanced training on management aspects (health financing, leadership/ governance, business planning, organizational development).

In-service training programs should be both broad and targeted for the multidisciplinary workforce, and revised on a regular basis according to latest evidence and guidelines.²¹ For example, significant and frequent recent changes in recommendations for the treatment of drug-resistant tuberculosis should lead to continued updates and training for medical practitioners, nurses and pharmacists, to enable an up-to-date multidisciplinary approach aligned with latest Australian and international recommendations.²⁶

It was identified in the *Pan-London tuberculosis services: a service evaluation*¹⁸ that professional bodies and cross-sector groups were valuable in enabling more consistent planning and coordination, and in providing a forum for discussion of broader issues, as well as a mechanism to combat professional isolation for those in small services.

The development of a formal network (community of practice) for TB nurses in Australia could provide a platform to leverage education opportunities and to enable discussion of strategic planning and cross-jurisdictional issues.

Identification of quality training and the formulation of coherent and comprehensive development strategies for staff are essential to developing and retaining skilled healthcare professionals.¹⁹

Responsibilities for training and development

Roles and responsibilities for training and development of both the TB-specific and general health professional workforce are varied and may be at a policy and/or operational level. NTAC, state and territory TB programs and program administrators, other professional organisations and individuals may all have a role to play in workforce development in various ways.

Role of the National Tuberculosis Advisory Committee

NTAC is an advisory committee, and as such has no operational funding attached to provide workforce development activities. However, as an advisory body it may have the ability to influence education for health professionals and to ensure TB remains in the curriculum for the professions working within the TB program. NTAC also has the capacity to shape public health research, through support for research in particular that determines optimal management of TB in low-incidence countries.⁶ Areas where NTAC may be able to shape the national agenda for workforce development and education include:

- development and support of TB-specific content in undergraduate and postgraduate university training:
 - working with existing training institutions to strengthen training activities;
 - supporting the ongoing development of the available TB-specific postgraduate nursing course; and
 - identifying opportunities for TB programs to offer speciality medical training;

- identification of training opportunities in Australia and overseas:
 - disseminating this information to jurisdictional program managers;
- support for jurisdictional program managers through advocacy and mentorship opportunities;
- collaboration at a jurisdictional level to implement training activities; and
- support for appropriate research activities in Australia and/or overseas.

Role of state and territory TB programs and TB administrators

The states and territories are primarily responsible for the delivery and management of public health services (including public hospitals and community health), with operational budgets and TB program administrators working under state and territory jurisdictions. In the United States of America, TB program administrators in low-incidence areas often cite consultation, training, and education as both their most important functions and their biggest challenges.⁶ Activities to support workforce development that could be undertaken at a jurisdictional level may include:

- assessing staffing needs at all levels and developing and/or revising job descriptions to correspond with current policies and recommendations;
- providing supervised involvement in clinical care, public health, and laboratory service provision;
- supporting staff to attend internal and external training and development opportunities;
- providing in-service training:
 - orientation programs;
 - regular clinical meetings;
 - nurses case conferences;
 - cluster investigation and contact tracing public health meetings;
 - TB nursing clinical skill set and competency standards;

- providing education to other healthcare professionals:
 - education opportunities such as grand rounds;
 - infection control training opportunities;
 - through healthcare contact tracing activities;
 - through occupational screening encounters;²⁷
 - educational opportunities through other professional bodies;
- supporting development of trainee registrars:
 - direct patient care exposure, in both inpatient and ambulatory settings;
 - complex case management;
- linking in with complementary programs (e.g. HIV care, refugee and migrant health providers);
- supporting appropriate research activities in Australia and/or overseas; and
- providing scope for research training activities, e.g. PhD.

Potential role of the Australian Centre for Disease Control

The Australian Government is establishing the Australian Centre for Disease Control (CDC), with an interim CDC in place on 1 January 2024.²⁸ The Australian CDC will have a focus on pandemic and emergency planning, but also work to prevent and control non-communicable (chronic) and communicable (infectious) diseases.

CDC functions that have been proposed as being in scope and that are relevant for TB include policy, reporting and guidance for communicable diseases, infection control and public health; public health workforce training and reform; and integration with the health system including primary care.²⁹

There is significant potential for an Australian CDC to provide national leadership for TB in Australia, including enhancing existing training, and developing and maintain workforce skills. Standardisation of activities across Australia, and a reduction in the duplication of efforts across jurisdictions, would contribute significantly to the development and maintenance of Australian's TB workforce.

As identified in the consultation paper on the roles and responsibilities of the CDC,²⁹ key elements during the COVID-19 pandemic response for First Nations and culturally and linguistically diverse communities, were ensuring that the response workforce had an understanding of cultural sensitivities and that communications employed were culturally appropriate. Workforce development regarding understanding of cultural safety that will be developed by the CDC will also be of significant value in the TB context for health professionals working with Aboriginal people, communities, and organisations, and for the migrant communities in Australia who experience significant burden of TB.

Other organisations and individual contributions

There is a network of other international, national, and local organizations that contribute directly or indirectly to the funding, service delivery, training, research, and development activities of the TB workforce within Australia. Key organisations and professional societies may provide various opportunities for training, including conferences. These include:

- Australian Government Department of Foreign Affairs and Trade;
- World Health Organization Western Pacific Regional Office;
- International Union Against Tuberculosis and Lung Disease;³⁰
- National professional bodies and their various special interest groups, including:
 - Thoracic Society of Australia and New Zealand;
 - Australian Society for Infectious Diseases;
 - Australian Society of Microbiologists;
- Professional medical colleges:
 - Royal Australian College of Physicians;
 - Royal College of Pathologists of Australasia; and
- Australian Respiratory Council.

Partnerships between organisations have also demonstrated effectiveness, with the Australian Respiratory Council partnering with jurisdictions and Western Sydney University to fund and develop a Master of Nursing (Tuberculosis Management) to provide speciality university training to TB nurses. The course commenced in 2020.

Individual practitioners have and continue to make significant contributions to development and training in nearby countries, including:

- consultancies to establish or improve regional National Tuberculosis Programs including building laboratory capacity;
- training workshops for TB staff; and
- participation as trainers in WHO workshops.

Summary

A specialist and multidisciplinary workforce is essential for a dedicated TB service. Developing and maintaining effective human resource management policy and practice can make a significant and measurable positive contribution to the performance of a TB program, as effective public health action requires an adequately staffed, highly skilled, diverse, and interdisciplinary workforce.³¹ NTAC, state and territory jurisdictions, other training organisations and individuals all have a role to play in attracting, recruiting, and retaining a diverse and sustainable workforce, and in providing staff with opportunities for education, training, and development to ensure innovative and effective delivery of TB programs.

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