

Australian Medical Workforce Advisory Committee

**SPECIALIST MEDICAL WORKFORCE PLANNING
IN AUSTRALIA**

**A GUIDE TO THE PLANNING PROCESS USED BY THE
AUSTRALIAN MEDICAL WORKFORCE ADVISORY COMMITTEE**

AMWAC Report 2003.1

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
AHMAC	Australian Health Ministers' Advisory Council
AHWOC	Australian Health Workforce Officials Committee
AIHW	Australian Institute of Health and Welfare
AMC	Australian Medical Council
AMPCo	Australian Medical Publishing Company
AMWAC	Australian Medical Workforce Advisory Committee
ARIA	Accessibility/Remoteness Index of Australia
FTE	Full time equivalent
ICD-10	International Classification of Diseases, Tenth Revision
MDA	Medical Directory of Australia
MTRP	Medical Training Review Panel
MWDRC	Medical Workforce Data Review Committee
RRMA	Rural, Remote, and Metropolitan Areas classification
SPR	Specialist: Population ratio
WHO	World Health Organisation

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Members have been appointed until 31 December 2005.

1. INTRODUCTION

This is a general resource document on specialist medical workforce planning in Australia. The paper covers both general health workforce planning principles as well as detailing the Australian approach to national level specialist medical workforce planning. The aim of this paper is to have a single resource document available to Australian individuals and organisations involved in health and medical workforce planning and policy which details the process, methodology, calculation tools and data sources used in the specialist medical workforce reviews undertaken by the Australian Medical Workforce Advisory Committee (AMWAC). Companion papers for general practice workforce planning and nurse workforce planning are also being prepared.

Structure Of This Paper

This paper begins by defining health workforce planning and discussing concepts associated with this activity. Chapter 3 outlines the role of key stakeholders in medical workforce planning, while Chapters 4 - 7 detail workforce planning methodologies currently employed by AMWAC, including measures and calculation tools used for describing, evaluating and predicting, workforce requirements, supply, and productivity. Chapter 8 presents strategies for correcting identified current and pending workforce imbalances and Chapter 9 describes data collections and data sources currently employed by AMWAC.

Additional background information is provided in the appendices. Appendix A provides an abbreviated picture of Australia's health system. Since 1995, when it was established, AMWAC has gained considerable experience in national level workforce planning and Appendix B provides a brief history of these activities, planning outcomes and current national workforce planning organisational structures. Appendix C provides a working example of the AMWAC specialist workforce projection calculation tool. Appendix D lists participants at the AMWAC Stakeholder Workforce Planning Workshop, held on 23 September 2002. Appendix E lists useful health workforce planning publications.

This paper should be seen as an evolving document, which will require updating as workforce policy changes, approaches to workforce planning evolve, new methodologies and calculation tools are developed, improved data collections become available, and new challenges and opportunities arise. On occasions the paper notes where further refinements to the existing workforce planning process may be necessary, noting the need for additional conceptual thinking and further improvements to data collections.

Acknowledgements

Information presented in this paper has been drawn from various sources, including AMWAC internal working documents, previous AMWAC publications, the reviews of AMWAC by the Australian Health Ministers Advisory Council (AHMAC) (AHMAC 2002) and the Australian Competition and Consumer Commission (ACCC 2003, Borland 2001), national and international literature review and a range of key stakeholders in Australian health workforce planning. The paper was finalised following its consideration at the

AMWAC Stakeholder Workforce Planning Workshop and feedback from health department workforce planners (Commonwealth, State and Territory). The input and comments from these individuals and organisations is appreciated. The assistance of the Australian Institute of Health and Welfare in drafting the section on data collections is acknowledged. The assistance of Dr Ron Van Konkelenberg in drafting the section on the AMWAC workforce calculation tool is also acknowledged. This paper was prepared within the National Health Workforce Secretariat by Paul Gavel, Mary Harris, Justine Curnow, Susan Jekel-Sadleir and Elizabeth O'Brien. Preparation of the paper was overseen by AMWAC.

2. HEALTH WORKFORCE PLANNING – DEFINITIONS AND CONCEPTS

Health care is about people providing care to other people. The health workforce is the complement of all individuals involved in the delivery of that care. The World Health Organisation (WHO) considers the health workforce to be the most important of the health system inputs (WHO 2000, WHO 2001).

What Is Workforce Planning?

Workforce planning is the systematic assessment of future human workforce needs and the determination of the actions required to meet those needs (Ripley 1996). Workforce planning for health is therefore the process of estimating the required health workforce to meet future health service requirements and the development of strategies to meet that need. It may occur at many levels; international, national, state or regional and organisational. The main focus of this paper is national level workforce planning. However, most of the concepts presented are also relevant to other levels of planning.

Health workforce planning is, of course, part of health service planning and the broader human resource process. For example, WHO (2001) and Hall (1998) note that the other parts linked to planning are workforce production and workforce management. Similarly, De Geyndt (2000) views workforce development as including three interrelated actions – planning the workforce (which is a quantity concern), training the workforce (which is a quality concern) and managing the workforce (which is a performance issue). Masterson and Humphris (2001) stress the importance of workforce planning being accompanied by education and training, good employment practices and reward systems. Queensland Health (2001) sees workforce planning as being concerned with defining, acquiring and sustaining the workforce of the future, and that as such it is a critical element of any organisation's strategic and operational planning. O'Brien-Pallas et al (2001) note that health workforce planning involves estimating future health workforce requirements and determining the most efficient and effective ways of providing for these. Requirements will be determined by broad decisions regarding the commitment of health care resources and the organisation, funding, level and mix of health care programs and services.

Consistent with the above definitions, the 2002 review of national medical workforce planning in Australia defined health workforce planning as being about planning for the future supply and distribution of properly educated and trained practitioners to best meet the population's need for quality health services, which is part of the broader continuum of overall health services planning and policy development (AHMAC 2002).

Workforce planning in the health sector may be usefully summarised as ensuring that the right practitioners are in the right place at the right time with the right skills.

However, workforce planning in the health sector is not an exact science, but rather an attempt to predict and determine the future on the basis of information available in the present (AHMAC 2002). Nor, in the health context, is it an easy task to determine the balance between the supply of labour and the need for labour, or the policies and

strategies that need to be employed to correct for any imbalances, both current and expected. Factors such as the long lead time required to produce a fully qualified health practitioner, the range of different occupations for which health professionals can be trained, changes in national health policy, the various institutional frameworks within which practitioners operate, the complexities associated with the determination of need, the unknown effects of more and better health care technology, and a lack of relevant, reliable information can all work to frustrate the workforce planning process (AMWAC 2000, Goldacre 2000, Duckett 2000, Borland 2002).

It is also worth remembering that, ideally, any exercise in futurism should draw on the momentum of the past (Mullan 2002). Accordingly, health workforce planning should be seen as an evolutionary activity of constant assessment, analysis, validation and renewal.

Why Workforce Plan In The Health Sector?

Workforce planning is undertaken to guide and inform workforce policy. The overriding assumption behind the notion of health workforce planning is that some level and form of planning is considered to be preferable to a more competitive, less interventionist, solely market based approach to determining workforce numbers, distribution and organisational structures.

In this context, workforce planning is considered important in the health care sector because of the unique nature of health care. Health care is not a “normal good”, in the economic sense of the word, and the health care sector does not represent a “free market” in the classical sense of the word. As Mooney and Scotton (2000), Hall and Van Gool (2000) and Borland (2002) note, health care is subject to market failure, due to imperfect information and unpredictable and irregular demand; and information asymmetries will generally constrain the set of market outcomes that can be achieved.

Health care is subject to altruistic externalities. Health consumers often face uncertainty and can lack information to make a fully informed rational decision. Practitioners can act in consumers’ interest, but will typically be better informed than the consumer. As such, this acting on behalf of the consumer threatens consumer sovereignty. The consumer has to trust the practitioner in this relationship and this sees the practitioner on both sides of the market; that is supplying and demanding health resources.

Further, as payment is often made by a third party, the consumer and practitioner may not be fully aware of the cost of health care and health treatments. The separation of consumer, practitioner and payer results in purchasing decisions being insensitive to price signals. Given the third party payer is often government, there is an implicit assumption that there is a role for government in the planning and organising of health services, including planning the health workforce. Thus, for example, in the Australian context, government is the initiator of the need for planning advice, and the agencies established to provide this advice report to government.

Bloor and Maynard (2003) observe, the market for health care human resources is not free because entry to the labour market is constrained by licensing and professional regulation, and wages are often negotiated nationally for groups of health professionals, making 'price' inflexible to changes in demand and/or supply.

For government there is also the task of ensuring that public resources are not wasted by the production of too many or too few health professionals. In the Australian context, too few practitioners could result in under servicing of patients, poor population health outcomes, overworked practitioners, higher prices, and longer waits by patients for services. Conversely, too many practitioners could result in over servicing of patients, underemployment of practitioners with a corresponding loss of skills, growth in non-price competition, potentially poorer health outcomes for the population, and unnecessary training and treatment costs. Both scenarios have negative patient care and cost implications for the community (Horvath et al 1998).

Finally, as Borland (2002) notes, health workforce planning can also be necessary because "information limitations make it difficult (if not impossible) to measure market performance against the benchmark of efficiency". Thus, Borland contends that in Australia the government has reverted, somewhat pragmatically, to an assessment approach to workforce market analysis and determination of whether there are enough practitioners with appropriate competence to meet population requirements. In this context, Borland suggests that the key workforce policy issues that should be examined are:

- is the number of practitioners adequate?;
- is the quality of health care services provided adequate?;
- is the distribution of practitioner services appropriate?; and
- is there anti-competitive behaviour (particularly in the context of medical specialists)?.

Borland (2002) also notes that if an assessment approach is being employed, the other key requirement is confidence that the best possible workforce planning process and methods are being used. To a degree this is common sense, but it is important to note. It is also important to acknowledge that this is also the view held by government and those organisations responsible for undertaking health workforce planning in Australia (AHMAC 2002).

For policy makers, workforce planning offers a practical guide to workforce policy development by providing information about current and future situations, including:

- identifying shortages and surpluses;
- defining (or redefining) workplace organisation, tasks and roles;
- establishing workforce education and training needs;
- providing knowledge and understanding of the workforce and its activities; and
- ensuring there is a process for systematically addressing the factors that are influencing workforce and workplace change.

As Hall (1998) notes, planning can:

- prepare the ground for decision making;
- provide options for decision makers;
- improve the quality of decisions;
- provide for the orderly implementation of activities or resources; and
- provide a framework for monitoring and evaluating progress towards defined goals.

Hall (1998) also highlights that workforce planning in the health sector is especially important when the following criteria apply to any given occupation:

- the public sector is the primary employer;
- the public sector is the primary source of training;
- much of the education and training is not under direct government control;
- the workforce requires substantial training in terms of length of time;
- the occupational category is costly, either in terms of high salaries or high numbers;
- reducing workforce numbers will be difficult;
- workforce shortages exist or are expected, and will, in turn, affect service delivery;
- minimum standards of performance are required;
- the workforce is undergoing change; and
- there is a favourable planning environment, including the availability of good data.

Requirements For Successful Workforce Planning

There are a number of basic, but essential, requirements for successful workforce planning, which can be summarised as:

- an appropriately resourced organisational structure to oversee the planning;
- stakeholder participation and commitment;
- clear principles, objectives, methodologies, models and processes, including having in place accepted and transparent methodologies and calculation tools for describing, evaluating and predicting workforce supply and requirements; and
- access to accurate, reliable, relevant and timely data (quantitative and qualitative, supply and requirements).

Fundamental to any workforce planning exercise is a commitment from stakeholders to the planning process, their participation in that process and their understanding of why workforce planning is undertaken and what the planning exercise can add to workforce policy development. Participation is also seen as important because of the key role stakeholders have to play in implementation of the planning recommendations and strategies and with the monitoring of this implementation and the outcomes of the planning exercise. Stakeholders in health workforce planning are government, consumers, service providers, the professions, the education and training sectors, and a range of inter-sectoral organisations.

It also needs to be recognised that health workforce planning is a dynamic process that will require regular updating and refinement of both the results, the process, the methodology(ies) and model(s), and the information inputs.

Workforce Planning Tasks and Processes

As indicated earlier, health workforce planning refers to the process of estimating the required supply of health care practitioners to meet an expected future level of service requirement as defined by population need and/or demand and the development of strategies to meet that requirement.

Opinions vary as to the best way to predict future population workforce requirements, some favour a normative needs approach based on population growth estimates combined with relevant health status indicators such as morbidity and mortality, and the incidence and prevalence of relevant illnesses. Others favour a demand-based approach, which uses population growth estimates in combination with indicators associated with consumer awareness, expectations and willingness to pay for services, with the latter frequently defined by service utilisation trends. (For some discussion see WHO 2001, Department of Health and Children 2002, Markham and Birch 1997, O'Brien-Pallas et al 2001, Roos et al 1999). In practice, most workforce planners use a complex array of indicators, both need-based and demand-based, in their efforts to predict future population requirements. Ideally the defining of need should be linked back to optimal models of care or disease management and be consistent with national health priorities. As far as is practicable an evidence based approach should be used in all analysis, however the extent of the application of this principle is determined by the availability of robust and reliable data.

Generally the planning process is concerned with:

1. Describing:
 - the unique services provided to the community by a particular workforce and the other service providers and infrastructure required to provide a sustainable service of acceptable quality;
 - the current level of supply in terms of workforce numbers, characteristics (age, gender, qualifications), participation (full-time/part-time, hours worked, by age and gender), distribution (by state/territory and other geographic measures, public sector and private sector), productivity, service provision (by type and quantity of service), and skills and tasks;
 - recruitment process, including the number, characteristics and training status of people currently undertaking training in Australia, and the number and characteristics of qualified people entering the workforce through migration; and
 - current level of wastage due to migration, people choosing an alternative career path, retirement and death.

2. Evaluating:
 - the adequacy of the current level of workforce supply based on a range of indicators (eg international and national benchmarks, service waiting time, population health status, perceptions of key stakeholders), with a view to quantifying the level of shortage or oversupply if indeed either situation is found to exist;

- the adequacy of the geographic distribution of the workforce using indicators such as level of service provision and population based benchmarks;
- the extent to which other service providers are currently doing some of the work traditionally undertaken by the workforce under review; and
- the extent to which the current workforce is providing services in line with government health goals and priorities.

3. Predicting:

- workforce requirements for a stated period of time (eg next 10 years) using a range of scenarios and requirement projection indicators; population needs based and demand-based and service provision benchmarks;
- workforce supply for a stated period of time using a range of scenarios (eg 'no change in the level of recruitment', 'increasing/decreasing the number of people undertaking training', 'increasing/decreasing the supply of qualified people entering the workforce from overseas', 'increases/decreases in level of workforce participation, and 'increases/decreases in attrition'); and
- the potential for changes in practice, service delivery and technology which are likely to effect population requirements for services or are likely to alter levels of workforce productivity.

Importantly, the assumptions underpinning workforce predictions need to be agreed upon by key stakeholders and clearly articulated. Chapter 5 (the section titled 'Predicting future workforce supply') outlines the assumptions that underpin most predictive analyses undertaken by AMWAC specialist workforce reviews.

Strategic actions arising from the planning process are usually based around influencing workforce supply through changes to local training program intakes, recruitment of overseas trained professionals, and actions to influence workforce attrition, distribution, skill mix, and productivity. Demand side strategies may also be considered, such as changes in work practices and organisation, referrer and consumer education. In practice, a combination of supply-side and demand-side options may be employed depending on the situation.

Overall, this approach to workforce planning involves supply analysis, requirement analysis, gap analysis, and solution analysis. AMWAC's workforce planning analysis processes and the conceptual models, methodology, calculation tools and data collections employed in that analysis are discussed in detail in Chapters 4 to 8. Chapters 4 to 7 detail the descriptive, evaluative and predictive processes, while Chapter 7 describes AMWAC's workforce supply and requirements projection calculation tool. Strategic options are considered in Chapter 8.

It should be noted, that in this paper the term:

- methodology is used to refer to the systematic assessment procedures that are used in the activity of health workforce planning;

- model refers to the simplified descriptions of a health workforce that are developed to assist with the mathematical calculations and predictions; and
- data refers to the known facts and information (quantitative and qualitative) that are used in the workforce analysis.

The approach to medical workforce planning employed by AMWAC has evolved over the last seven years as part of a continual learning and quality improvement process. This process has been enhanced through consultation with international health planners, experience gained through review of 23 workforce disciplines, research to increase understanding of complex issues, and improvements in medical workforce data collections.

The importance of good data to the planning process cannot be underestimated. For example, the Committee of Inquiry into Medical Education and Medical Workforce (1988) drew attention to deficiencies in the quality of medical workforce data in Australia and recommended the establishment of a national database. AMWAC has noted that this is the key determinant of the process and methodology it has employed in assessments of the Australian medical workforce. Similarly, Borland (2002), in considering an optimal method for assessing efficiency in the market for medical specialists notes that the economist's theoretical approach is probably not possible due to data constraints, where an ideal method could be:

to develop a model of demand for health care services provided by that specialist group and the cost of provision of those services, and to use that model to predict the optimal quantity of specialists, the quality of services they should provide and how patients should be matched to specialists. Optimal outcomes could then be compared with actual market outcomes in order to assess efficiency. Unfortunately, such an approach seems infeasible because of its informational requirements. What would be needed to implement the approach would be information on patient preferences, on costs of supply of medical practitioners, on external costs/benefits in the market and on how features of the market, such as information asymmetries, constrain market outcomes. Given the institutional structure of the market for medical services in Australia and existing data sources, this seems an impossible task. (Borland 2002, p. 255)

The key medical workforce data collections used by AMWAC are detailed in Chapter 8 of this paper.

Workforce Planning – A Dynamic Process

Health systems and health workforces are dynamic and constantly evolving. This has two key impacts on the workforce planning process. First, the impact of any broad health policy, service delivery and/or technology change on the workforce needs to be considered as part of the supply and requirement analysis and prediction process. These impacts can be considered in terms of anticipated changes or simulated adjustments. The second consequence of the dynamics of health systems and the health workforce is that there will be a need in any planning exercise to constantly monitor, update and refine the workforce analysis and planning advice.

In terms of dynamics, several basic trends seem likely, and all imply an innovative and constantly evolving workplace and workforce. These trends are:

- more and better technology;
- new and varied approaches to service delivery and the provision of care;
- new roles for old disciplines and new disciplines;
- a focus on quality cost efficient service provision;
- increased consumer participation;
- greater availability of accurate, timely information;
- continuing demographic shifts; and
- the continued development of the global community.

Overall, from the workforce planning perspective any health policy, service delivery or technology change must be quantifiable in terms of an impact on demand, productivity or practice, or a combination of all three.

Defining The Scope And Focus Of The Workforce Planning Process

Workforce planning is a complex resource intensive activity designed to reduce uncertainty and to bring about desired strategic change within the Australian health system. It is therefore important that the scope and focus of the proposed planning exercise be clearly defined and acknowledged by all key stakeholders.

Will the planning be integrated across all relevant professions or profession specific?

Depending upon planning objectives and organisational structures, workforce planning can be integrated across the whole health workforce, focused on specific care groups or be more profession specific. The current preference amongst most health organisations worldwide is for some form of integrated planning where this is appropriate. The WHO notes that health human resource planning should be broad in nature, ideally covering the entire health workforce. Differing national requirements and priorities are however recognised and this relates to the variation among nations in political, social and health goals, health service delivery systems, health financing arrangements and socioeconomic well being (WHO 2000).

How will the workforce planning exercise relate to the broader health organisation?

It is also necessary to consider how any workforce planning will relate to broader health organisation, service delivery and financial planning, as well as the achievement of health system goals based around performance management, improving health outcomes and the maintenance of quality. These linkages may vary with the needs and goals of the organisation(s) commissioning the planning.

What are the objective(s) of the workforce planning exercise?

Another relevant consideration is the objective(s) of the planning. Again this can be expected to vary with the goals of the commissioning organisation(s) and over time. It could, for example, range from requiring advice on education and training intakes for existing health professions, to a strategic overview of a particular workforce, service delivery model, or disease management approach, through to the development of

recommendations for a systematic realignment of practitioner tasks and functions across a health service and determination of the skills necessary to perform the realigned tasks. The precise objectives will generally be set by the organisation(s) commissioning the planning.

Is the planning focused at the national, regional or local level, or a combination of each?

A further consideration is whether a planning organisation is to focus on the national level or at the more regional or local level, or a combination of all three. This also needs to involve consideration of how disaggregated any analysis should be and whether the planning is top down (ie. national \Rightarrow regional \Rightarrow local) or bottom up (ie. local \Rightarrow regional \Rightarrow national). In the Australian context regional refers to State/Territory jurisdictions and local to either community or local government area.

Data availability can be a consideration here. For example, relevant complete data sets may only be available at the national level, which in turn would preclude planning from the local level and aggregating up to provide a national picture. However, the reverse may equally be true in that a more accurate assessment of workforce dynamics may be best achieved at the more local level.

A distinction is also sometimes made between national, or macro level, planning and more localised, or micro level, planning. The aim of national planning is to ensure that the workforce needs of a particular system, profession, industry or service are provided for, and to provide a framework for correcting any future disparity between the supply and demand for labour.

Generally, local or micro level planning refers to planning undertaken within a particular organisation, region, discipline or job category. Local level planning may be guided by the outcomes of national planning activity or it may be a discrete activity in its own right. Local planning should provide an organisation or region with a framework for making human resource decisions, taking into account factors such as strategic directions, finances, tasks, workload and required competencies.

Is the planning exercise concerned with providing advice on workforce numbers only?

It is important for any commissioning organisation(s) to determine whether the workforce planning exercise should focus specifically on providing advice on future workforce numbers only, or whether this advice should be broader in nature and also cover relevant related issues such as for example, workplace organisation, training arrangements, service provision, finance and cost, infrastructure development, competition, work practices, safety and quality, education and training, and governance.

What is the timeframe for the planning exercise?

It is also necessary to determine the planning timeframe, ie 3 years, 10 years, 20 years. How far to project into the future needs to be assessed by balancing the greater potential certainty of short range planning against the need to plan for longer term assessments and direction setting. Longer timeframes provide more flexibility in planning and allow

time for workforce adjustments to be implemented, but are less certain and usually require regular monitoring, updating and validation. Too short a timeframe may not provide adequate time for workforce transition processes and changes to be implemented, and future changes may not be adequately anticipated.

As this is a general introductory section, how these questions are resolved in the Australian context are detailed in the sections that follow.

The Australian Medical Workforce Advisory Committee (AMWAC)

AMWAC was formed as a national advisory committee in 1995 to assist with the development of a more strategic focus to national medical workforce planning. The formation of AMWAC reflected recognition of the need for:

- a national focus on longer term medical workforce planning;
- a skilled committee of key stakeholders (government, profession, service providers, consumers and educators) working in partnership; and
- workforce analysis using robust data and a consistent planning approach, with a continuity in recommended action.

AMWAC reports to the Australian Health Ministers' Advisory Council (AHMAC), and through AHMAC to the Australian Health Ministers' Conference. AMWAC is one of three AHMAC workforce committees, the other two being the:

- Australian Health Workforce Officials Committee; and
- Australian Health Workforce Advisory Committee.

The Australian Health Workforce Officials Committee (AHWOC) provides a forum for reaching agreement on key national level health workforce issues requiring government collaborative action and provides advice on health workforce issues to the Australian Health Ministers' Advisory Council (AHMAC). AHWOC also has a central role to play in co-ordinating the implementation of the recommendations arising from the workforce planning analysis undertaken by AHWOC and AMWAC. The Committee comprises a nominee from each of the Commonwealth/State/Territory health departments and the Commonwealth Department of Education, Science and Training. The Australian Health Workforce Advisory Committee fulfils a similar role to AMWAC but with a focus on the nursing, midwifery and allied health workforces.

AMWAC comprises an independent chair and representatives from Commonwealth government departments, state and territory health authorities, the chair of the AHWOC, the Australian Institute of Health and Welfare, the Australian Medical Council, peak organisations representing various sections of the medical workforce (including the Australian Medical Association, the medical colleges and university medical schools), a member with consumer expertise, and a member with expertise in economics/health economist or labour market economics.

AMWAC oversees a medical workforce research program which is approved by AHMAC. This specific medical program is complementary to, and linked with, the broader health workforce research agenda overseen for AHMAC by AHWOC.

The terms of reference AMWAC operates under are:

1. To provide advice to the Australian Health Ministers' Advisory Council on a range of medical workforce matters, including:
 - the structure, balance and geographic distribution of the medical workforce in Australia;
 - medical workforce supply and demand; and
 - the number and distribution of education and training places needed to meet future demand as suggested by patterns of supply, population health status, practice developments and changing models of health care.
2. To develop models for describing and predicting future medical workforce requirements, and provide advice on its methodology, including indicators and benchmarks, for use by employing and workforce controlling bodies including governments, specialist medical colleges and tertiary institutions at:
 - national level;
 - state and territory levels; and
 - intra-state and territory.
3. To oversee the establishment and development of data collections concerned with the medical workforce, and analyse and report on those data to assist workforce planning.
4. To work in co-ordination and co-operation with the Australian Health Workforce Officials' Committee (AHWOC) in the assessment of the relationship between medical workforce requirements and new or alternative workforce structures, profiles and broader health human resources planning requirements.
5. To provide AHMAC with advice as requested on:
 - best practice models of care;
 - future service delivery and workforce developments; and
 - dynamic scenario planning for the medical workforce.
6. To take into account in its planning, and provide advice in its reports, on information on evidence based practice and outcomes.
7. To advise AHMAC on strengths and weaknesses of possible approaches to achieving desirable workforce supply in accordance with quality health care practices.

In addition to the above terms of reference, AHMAC has asked that each AMWAC workforce review be cognisant of the following factors, (as outlined in the recommendations of the 2002 Review of AMWAC; AHMAC 2002):

1. That AMWAC should consider evidence in the following areas:
 - consumer expectations (eg. access, choice, consumer trends);
 - demographic (eg. changing population, rural issues);
 - economic (eg. corporatisation, changes in health insurance coverage and utilisation, changes in medical indemnity);

- medical workforce (eg. full-time vs. part-time work, career changes, implications of decisions on safe working hours, long-term decline in hours worked, gender distribution, use of overseas trained doctors, changes in training);
 - epidemiological (descriptive and analytical eg. changing disease patterns, Aboriginal and Torres Strait Islander health issues);
 - health system (eg. impact of shortages in nursing and allied health, change in health technology, health delivery and practice, public hospital administration); and
 - international (eg. migration policy, benchmarking, globalisation).
2. That AMWAC should provide information at the national, state/territory, regional and local levels.
 3. That AMWAC should provide advice on possible approaches to achieving a desirable workforce supply with reference to:
 - adjusting training numbers;
 - addressing maldistribution;
 - importing additional practitioners; and
 - possible workforce substitution.
 4. That AMWAC should provide advice on supply and demand according to more than one forecast scenario.

Further information on AMWAC and Australia's national workforce planning structures are contained in Appendix B.

Summary

In summary, workforce planning in the health sector involves describing, evaluating and predicting workforce supply and population requirements for the services provided by a particular group of service providers and the development of strategies to alleviate current and anticipated imbalances between supply and requirements. To be effective, the workforce planning process requires the participation and commitment of key stakeholders, timely access to reliable and relevant data, appropriate methodologies and calculation tools, and an appropriately resourced organisational structure to oversee and conduct the planning.

3. STAKEHOLDER PARTICIPATION IN MEDICAL WORKFORCE PLANNING

Workforce planning does not occur in a vacuum. The effects of it are felt by a variety of people who occupy different positions within the health system, ranging from the government official briefing his or her Minister, to the hospital administrator who draws up rosters, to the educationalist who designs training programs, and ultimately to the consumer whose health and wellbeing the health system is designed to ensure. How best then, to capture the views and expertise of these organisations and individuals and to ensure that all perceive the process to be transparent and equitable. This chapter identifies key groups with an interest in medical workforce planning, and examines different methods of obtaining input and ensuring participation.

An exchange of information occurs with proper consultation. Workforce planners benefit from learning the views and judgements of stakeholders, while stakeholders acquire further knowledge from their exposure to the workforce planning process. If conducted thoughtfully, this mutual information flow should become embedded in the planning process, and ensure that when planning is undertaken it incorporates the needs of stakeholders into its assessments.

Key Medical Workforce Planning Stakeholders

A number of groups should be considered as key stakeholders in health workforce planning. Many of these hold essential information for workforce planning; all have an interest in either its process or outcome or both. The six broad groups of stakeholders are:

- 1) government;
- 2) inter-sectoral organisations;
- 3) service providers;
- 4) profession;
- 5) education and training; and
- 6) consumers.

Within each broad group there may be a number of organisations, the views of which may not always be in accordance with each other. One of the challenges facing workforce planners is to be aware of and balance these sometimes disparate views. This is usually most effectively achieved through the open communication processes of consultation and liaison. It is important to note that the medical workforce in Australia is a small community, and that it is inevitable that the same individuals may hold a variety of positions with different organisations. Rather than being problematic this can actually bring a sense of balance to proceedings, as these people's contributions are infused with the understanding of a range of perspectives.

These six groups are briefly described below.

Government

Government is a broad category encompassing a variety of departments and agencies at different points of the workforce continuum. It ranges from regulatory authorities,

responsible for enforcing standards maintenance, to health departments – Commonwealth/state/territory – for which the results of workforce planning may have potentially significant funding and policy implications.

The many arms of government are represented on such a multitude of committees and councils that their views are usually well known, but the sheer size of their bureaucracy can sometimes be an impediment to effective communication and liaison.

Inter-sectoral organisations

The organisations that belong in this category tend to have a broader focus than workforce, but one that is affected by the outcomes of workforce planning. Examples include committees examining quality or best practice standards in the health system, which maintain a link with workforce planning as part of their broader ambit.

Service providers

Service providers have a direct interest in workforce planning, as they, second only to consumers, are most immediately affected by its results. For the most part this refers to hospitals and health facilities, although the move away from the acute sector has broadened the scope of service provision to include more community-based health care.

Profession

The category of 'profession' includes a variety of perspectives and organisations, ranging from industrial concerns to groups which are formed along discipline-specific lines or more thematic considerations, such as location of practice (rural areas) or shared identity (Indigenous or female medical practitioners).

Education and training

There are several points of education on the workforce continuum, ranging from university medical education through to early postgraduate years, where the Postgraduate Medical Education Councils play a pastoral role in education, and the years spent in training programs, where both the medical colleges and service providers play a role in the provision and supervision of training.

Consumers

The health and well-being of consumers is the *raison d'être* of the health system, yet of all stakeholders, it is the views and input of consumers which are the most difficult to elicit. Unlike all other stakeholders identified above, who have an opportunity to participate through existing structures and channels, consumers are often marginalised because of the diffused nature of their existence, and their sometimes more passing encounter with the health system. This means that extra steps may need to be taken to ensure their participation in workforce planning processes, however it is the role of workforce planners to be cognisant of this and ensure that consultation strategies are appropriately constructed.

Approaches To Stakeholder Participation In Medical Workforce Planning

Stakeholder participation takes many guises – working party membership, submissions, regular liaison, conference attendance. The most effective method of ensuring stakeholder participation will vary according to the workforce or topic under review and the stakeholders to be included. For example, a small workforce that exists only in teaching hospitals (such as neurosurgery) will require a different approach to identifying stakeholders and ensuring their participation than a more diffused workforce, such as general practice or psychiatry.

Participation operates on two levels – the ongoing communication between workforce planners and stakeholders which occurs through the existence of AMWAC itself, and through such mechanisms as cross-committee membership, conference attendance and regular liaison with organisations and individuals. This ensures that workforce planners are perpetually cognisant of issues in the broader health system.

At a more specific level, when particular workforces are being reviewed there is the opportunity for explicit input and participation by individuals and organisations concerned with that particular workforce.

A brief description of each method of involvement follows.

Committee membership

AMWAC is a panel of experts appointed by government to provide advice to them in areas of medical workforce planning and policy that they consider to be of national importance. The Committee is structured so as to have a balanced representation of key stakeholders.

AMWAC draws its membership from government, the profession (both in a professional sense through the medical colleges and in an industrial/professional sense through the Australian Medical Association), the regulatory authorities, the education sector, the Australian Institute of Health and Welfare and consumers. There is also an economist. Membership from state and territory government rotates such that no one state or territory holds permanent membership; rather, two positions are shared among small and large jurisdictions. Nominees from governments may include representatives from hospitals, ensuring that a link is retained with the service delivery sector. Meetings are held, on average, three times a year.

AMWAC is supported by the National Health Workforce Secretariat. The secretariat is a body of analysts, planners, economists and statisticians with experience in health workforce planning.

AMWAC working party membership

For each AMWAC workforce review project a panel of experts, referred to as a working party, is formed to oversee the project. The panel assists in making judgments on the assumptions to be incorporated into any projection modeling; and advises on the reliability

and validity of data and the specific issues that will need to be considered in the planning process.

If used, expert panels need to be drawn from all key stakeholders. Generally this can be expected to cover government (both from the policy and service delivery perspective), the profession(s), consumers, the education and training sector(s) and individuals with specific expertise in the workforce(s) under review or the methods being used in the review.

Stakeholder organisations invited to participate in the expert panel are engaged as expert nominees from the organisation rather than representatives of the organisation. This is a subtle distinction but aims to ensure that the panel functions as a “true” panel of experts rather than just a collection of individuals advocating the particular viewpoint or theory held by their individual organisations.

AMWAC’s preferred composition for each working party is to have, at a minimum, an independent chair (drawn from the membership of AMWAC); two nominees from the profession under review (drawn from the main peak body/bodies representing that profession); two nominees of government (drawn from nominations supplied by government health departments); and a consumer nominee (provided by either the Consumers’ Health Forum or the Health Issues Centre). The chair of each panel is generally drawn from the AMWAC membership to ensure there is a link back to AMWAC and that there is continuity of approach across the working parties. Specific experts are also included on working parties as required. A team of analysts from the National Health Workforce Secretariat supports each AMWAC working party.

Conference attendance

Attendance at conferences dealing with medical workforce issues, and on occasion the broader health system, play an important part in informing the knowledge base of workforce planners and of alerting them to issues and perspectives which are considered important by stakeholders. Conferences also allow for workforce planners to present papers and receive feedback, thereby continuing the cyclic nature of workforce planning and stakeholder participation.

Consultation

Consultation is of paramount importance in workforce planning. It is more than a one-off inquiry to the heads of governments and other bodies; rather it is an exercise requiring careful thought about which organisations and individuals have an interest in, or contribution to make to, workforce planning. As identified earlier, it operates on both a macro and micro level. At a macro level it involves participation in on-going forums and a constant awareness of broader issues and agendas. At a more specific level it involves identifying individuals and organisations with a particular interest in a specific workforce. For some of the more diffused workforces, such as psychiatry or general practice, it may take longer to identify interested parties, as they may be less likely to be members of the established consultative process. On such occasions this can be supplemented by a call

for submissions (see below). An effective consultation strategy is one which ensures that there is both depth and breadth to the range of individuals and organisations consulted, and is conducted in a flexible and mutually convenient fashion, appropriate to the needs and wishes of stakeholders. For example, when consulting with medical practitioners it may be appropriate to offer to meet at times which do not conflict with clinics or ward rounds.

Liaison

While bearing many similarities to consultation there are subtle differences about liaison. It is less formal in nature, and requires establishing and maintaining effective contacts with relevant individuals and organisations, and use over time, as required, of the knowledge and expertise the individual or organisation has to contribute. This relationship will be used to both meet challenges and identify emerging ones.

Submissions

A call for submissions has not been standard practice for AMWAC workforce reviews, but is considered an appropriate method of reaching individuals and organisations who may not be part of the established consultative process. It is sometimes used as a 'litmus test' in gauging the range of perspectives on an issue. It also allows for those who are either unable or unwilling to be consulted, to still participate in the workforce planning process. While this is an option for all stakeholders, it is the primary method of participation for individuals who are not members of the established participation process.

Cross-committee membership

This method of stakeholder participation allows for cross-fertilisation of ideas and consistency of approaches, where appropriate. As many other organisations and committees have agendas which either affect, or are affected by, workforce planning it is not unusual to have items on respective work-plans which require shared information and approaches in order to complete tasks.

The following tables identify which groups are identified as stakeholders in medical workforce planning, and the principal methods of engaging them in this process.

Table 1: Medical workforce planning participants – government, by principal methods of involvement

Organisation	Principal methods of involvement
Commonwealth Department of Health and Ageing	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working Party membership ▪ Consultation and liaison
Commonwealth Department of Education, Science and Technology	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working Party membership ▪ Consultation and liaison
Commonwealth Department of Immigration, and Multicultural and Indigenous Affairs	<ul style="list-style-type: none"> ▪ Consultation and liaison
Australian Institute of Health and Welfare	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Cross-committee membership ▪ Working Party membership ▪ Consultation and liaison
Australian Competition and Consumer Commission	<ul style="list-style-type: none"> ▪ Consultation and liaison
Health Insurance Commission	<ul style="list-style-type: none"> ▪ Consultation and liaison
State and territory health authorities	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working Party membership ▪ Consultation and liaison
Regulatory authorities (eg. individual medical registration boards)	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Consultation and liaison

Table 2: Medical workforce planning participation – consumers, by principal method of involvement

Organisation	Principal methods of involvement
Peak bodies representing consumers (eg. Health Issues Centre, Consumers' Health Forum)	<ul style="list-style-type: none"> ▪ Committee membership ▪ Working Party membership ▪ Consultation and liaison
Individuals	<ul style="list-style-type: none"> ▪ Consultation ▪ Submission
Groups representing either those with a particular condition (eg. sleep apnoea, or family members affected by condition, eg. mental health)	<ul style="list-style-type: none"> ▪ Consultation and liaison ▪ Submission
Thematic groups (eg. Health Consumers of Rural and Remote Australia)	<ul style="list-style-type: none"> ▪ Consultation and liaison ▪ Submission

Table 3: Medical workforce planning participants – inter-sectoral organisations, by principal methods of involvement

Organisation	Principal methods of involvement
Australian Health Workforce Officials' Committee	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Cross-committee membership ▪ Consultation and liaison
Australian Medical Council	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Cross-committee membership ▪ Consultation and liaison
Divisions of General Practice	<ul style="list-style-type: none"> ▪ Working Party membership ▪ Consultation and liaison
Medical Training Review Panel	<ul style="list-style-type: none"> ▪ Cross-committee membership ▪ Working Party membership ▪ Shared projects
National Council for Safety and Quality in Healthcare	<ul style="list-style-type: none"> ▪ Cross- committee membership ▪ Consultation and liaison
National Institute of Clinical Studies	<ul style="list-style-type: none"> ▪ Consultation and liaison
National Rural Health Alliance	<ul style="list-style-type: none"> ▪ Consultation and liaison
Rural Workforce Agencies	<ul style="list-style-type: none"> ▪ Working Party membership ▪ Consultation and liaison

Table 4: Medical workforce planning participants - service providers, by principal methods of involvement

Organisation	Principal methods of involvement
Hospitals and health facilities (both public and private sectors)	<ul style="list-style-type: none"> ▪ Working Party membership (through state/territory governments) ▪ Consultation (site visits)
Peak bodies representing hospitals and health facilities (eg. Australian Healthcare Association, Women's Hospitals Australasia, Catholic Health Australia, Private Hospitals' Association)	<ul style="list-style-type: none"> ▪ Consultation – facilitate access to individual units ▪ Liaison ▪ Submissions
Other health professions – nursing, allied health	<ul style="list-style-type: none"> ▪ Consultation and liaison ▪ Submissions

Table 5: Medical workforce planning participants – profession, by principal methods of involvement

Organisation	Principal methods of involvement
Medical colleges (both Committee of Presidents of Medical Colleges and individual medical colleges)	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working Party membership ▪ Cross-committee membership ▪ Consultation and liaison
General Practice Education and Training (and individual general practice training consortia)	<ul style="list-style-type: none"> ▪ Working Party membership ▪ Consultation and liaison
Industrial organisations (eg. Australian Medical Association, Australian Salaried Medical Officers' Federation)	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working Party membership ▪ Consultation and liaison
Doctors-in-training (eg. AMA Committee of Doctors In Training, General Practice Registrars' Association)	<ul style="list-style-type: none"> ▪ Working Party membership ▪ Consultation and liaison
Professional associations (discipline specific, ie. Australian Orthopaedic Association, Gastroenterological Society of Australia)	<ul style="list-style-type: none"> ▪ Working party membership ▪ Consultation and liaison
Professional associations (thematic, ie. Rural Doctors' Association of Australia, National Association of Indigenous Doctors)	<ul style="list-style-type: none"> ▪ Working Party membership ▪ Consultation and liaison
Medical students (eg. Australian Medical Students' Association)	<ul style="list-style-type: none"> ▪ Working Party membership ▪ Consultation and liaison
Individual practitioners	<ul style="list-style-type: none"> ▪ Consultation ▪ Submissions

Table 6: Medical workforce planning participants – education and training, by principal methods of involvement

Organisation	Principal methods of involvement
University medical schools	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working Party membership ▪ Consultation and liaison
University research centres (eg. Centre for Health Economics and Research Evaluation, Centre for Rural Health)	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working Party membership ▪ Consultation and liaison
Medical colleges	<ul style="list-style-type: none"> ▪ AMWAC membership ▪ Working party membership ▪ Consultation and liaison
Postgraduate medical councils (both the Confederation of Postgraduate Medical Education Councils and state based councils)	<ul style="list-style-type: none"> ▪ Working Party membership ▪ Consultation and liaison

4. MEDICAL WORKFORCE PLANNING – DESCRIPTIVE ANALYSIS

Once workforce planners have identified the relevant key stakeholders and have their support for a planning activity, the first task is to describe the respective workforce. This chapter details AMWAC's approach to describing a specialist medical workforce.

Guiding Principles

AMWAC finds it useful to begin a planning process by defining the role and unique services provided to the community by the medical workforce under review and to gain agreement among key stakeholders as to the principles that will be used to guide data collection, analysis and interpretation and development of recommendations arising from the planning process. Generally, the guiding principles are:

- the Australian community should have available an adequate number of trained specialists, appropriately distributed to provide the services it requires;
- the community is best served when specialists have high standards of qualification and work with a high level of ongoing experience;
- standards of practice will be highest if specialists perform a reasonable volume of work;
- the best assurance of standards is a high quality requirement for entry to practice and a high quality requirement for continuing practice; and
- all Australian citizens should have access to a good standard of specialist care irrespective of geography and economic status. In achieving this, convenience to the patient should be balanced against the quality of services that can be distributed to meet that convenience.

In terms of report writing and documentation, the principle should be that all information and analysis is outlined and discussed, and all workforce modelling assumptions and calculations are clearly set out. This should ensure that any reader of an AMWAC report can understand the conceptual thinking of AMWAC, appreciate the workforce analysis and follow all of the workforce calculations and projections.

Describing The Current Workforce

The current practising workforce is counted and described in detail. This includes relevant demographic characteristics - importantly, age and sex and in some cases qualifications and ethnic background. Workforce participation is described, usually in terms of number of hours worked, on average, per week and this is cross-tabulated with age and sex.

There may be an issue of whether to count workforce supply in terms of the head count or the full time equivalent (FTE) workforce. An FTE count will always be the more accurate figure as it is a measure of the available effective workforce and this is the approach used by AMWAC. However difficulties may be encountered in gaining an accurate measure of the workforce or what constitutes one FTE. Generally in the health context an FTE will be measured in terms of the hours worked or the number of standard sessions worked, although even sessional definitions can vary. In the AMWAC work an FTE is measured in terms of the hours worked.

The above two sets of information, in combination with data about number and characteristics of new workforce entrants and known attrition rates, are essential to establishing a baseline from which to predict future workforce supply. AMWAC's approach to predicting future workforce supply is described in Chapter 5.

Workforce distribution is a further important descriptive measure. State/Territory, geographic location and work setting are the usual measures. To date, AMWAC has described geographic location using the Rural Remote and Metropolitan Areas (RRMA) classification (DPIE and DSHS 1994). It is recognised that there are other geographic classifications, for example the Accessibility/Remoteness Index of Australia (ARIA) and over time these alternative tools may become more appropriate (Department of Health and Aged Care 2001). Increasingly a combination of both RRMA and ARIA are likely to be used in describing workforce geographic characteristics.

Service provision is a further descriptive measure, which is usually described by number and type of services, including public private mix, and state/territory and geographic distribution. With most medical workforces, particularly with the procedural specialties, there are at least two relevant sources of data on recent service utilisation trends, viz., Medicare data and public hospital casemix data. Where relevant, trend data on hospital separations following specialist procedures can also provide a useful indication of likely future growth in requirements. Obviously, the usefulness of this information is dependent on how accurately it reflects the work performed by the particular medical workforce under review. For example, hospital separation data may be most useful for surgical workforces, where procedures are clearly defined and are clearly representative of the work performed by the workforce. The service provision analysis also includes consideration of other medical and non-medical disciplines and the support services required to provide a sustainable service of acceptable quality that meets standards of best practice (AMWAC 1998).

Workforce distribution and service provision are also used in combination with other data to assist in assessing the adequacy of the distribution of the current workforce. AMWAC's approach to evaluating workforce adequacy is described in Chapter 4.

It should be noted that gaining accurate and up-to-date baseline data may prove to be a challenging task. Data on workforce numbers is available for most specialist medical workforces from the annual AIHW medical labour force survey. The survey results provide information to allow the structure of the workforce to be defined by five-year age gender cohorts. In addition, the baseline supply is defined in terms of average hours worked per week by each five-year age/gender cohort.

It is also usual for the AIHW medical labour force survey to be compared with and validated by other supply data collections. The other main sources of supply information are usually the relevant professional organisation and the Medicare database. The Australian Bureau of Statistics (ABS) census information can also be utilised. The AIHW data is usually the most comprehensive, however on occasions it may be necessary to

conduct a reconciliation process and use an adjusted AIHW figure as the baseline supply figure. The main data collections used in medical workforce planning are discussed in more detail in Chapter 8.

Workforce Additions

Specialist Vocational Training Program

The main source of additions to a specialist medical workforce is new entrants from the respective vocational training program. The first task here is to describe the training program, including the number of years required to become a fully qualified specialist, type of training and whether rural experience is part of the training program.

The second task is to describe the complement of people undertaking training, including the number of trainees, by year of training, by age, sex and full-time/part-time status, the number of graduates from the program during the past five to ten years and the number of expected completions by the expected year(s) of completion. This information is obtained from the relevant medical college and is used in calculations designed to predict future workforce supply, which is addressed in Chapter 5.

Migration

Another source of new entrants to the workforce is net immigration. Information on migration into medical workforces is obtained from the Australian Medical Council and the relevant medical college. This entrant information is also described by age and gender.

Workforce Re-entry

The number of people expected to re-enter a workforce is becoming an increasingly important measure. This situation arises when doctors decide to take a break from the workforce for a period of time and then decide to re-enter the workforce. Currently, there is little data available to describe this phenomenon with respect to medical workforces.

Workforce Attrition

Losses from the workforce are described and primarily include retirements, deaths and migration.

Retirements

As information about the number of retirements from a particular medical workforce is not readily available an estimate is usually made, drawing on information that the respective college may hold on attrition rates and the age profile of the workforce. For example, number of retirements may be estimated by making an informed assumption about the average retirement age for the workforce, and applying this to the current and projected workforce age profile to estimate the total number of expected retirements. Information on anticipated retirement age is usually obtained by AMWAC by surveying the respective workforce and asking respondents to indicate their retirement intentions. Retirement assumptions by specific age/gender cohorts are included in calculations designed to predict future workforce supply. This is addressed further in Chapter 5.

Migration

Information on overseas migration from the workforce is sometimes available from the relevant college. It may also be obtained from the Department of Immigration and Multicultural Affairs and Indigenous Affairs, but this is usually general and not defined by individual medical workforce.

Death

Information on number of deaths is generally not available, although some medical colleges are able to provide historical information about attrition through death. In many cases the respective working party may need to make an informed estimate.

5. MEDICAL WORKFORCE PLANNING – EVALUATIVE ANALYSIS

An evaluation of the adequacy of the workforce is undertaken to determine whether a shortage or excess supply situation currently exists. This assessment is then incorporated into the projection modelling process, which is detailed in Chapter 7.

An indicator approach is usually used by AMWAC to evaluate the adequacy of supply of specialist medical workforces. With this approach a set of indicators are chosen, measures for each indicator are calculated, and an evaluation of each measure consistent with a specified standard for adequate supply is made. A number of standard indicators are available in making this assessment and application can vary with the workforce under examination and the availability of information. Indicators can include funded vacant positions, practitioner to population ratios, service waiting times, excessive hours of work, extent of total supply provided by non-specialist staff, price, and the views of practitioners, referring practitioners, managers, carers and consumers.

Assessing the adequacy of a workforce is the most difficult part of workforce analysis. This is due to the absence of relevant data collections in some cases or the difficulty with separating workforce effect from the effect of other factors such as funding, or with determining at what level an indicator suggests workforce surplus or shortage. Judgement is required in making many of these assessments. These issues are discussed in this Chapter where relevant.

The indicators set out below are for medical workforce assessments. Some of them may be appropriate for other health professions but not all. The indicators have been developed by AMWAC and informed by national and international literature. The advice from the Australian Competition and Consumer Commission through the work undertaken for them by Professor Jeff Borland of Melbourne University has also informed the development of the indicators and the principles to be applied in their assessment.

In using the indicators a set of guiding principles have been developed for their application (although it is recognised that in some cases the nature of the indicator means that their application is considered in quite broad terms). The guidelines assist in making a judgement as to whether the indicator suggests an adequate supply or excess in supply or a shortage. The indicators should be considered as a total package. If all, or most, indicators suggest a likely shortage or excess then the conclusion on adequacy is straightforward. Divergence in what the indicators are suggesting will be more difficult to assess. If this is the case it is suggested that more weight should be provided to those indicators that have used the more reliable data sources. The discussion also notes where further work will be necessary for some of the indicators to establish suggested benchmarks for guiding decisions and to determine the precise effect due to workforce shortage or surplus.

In applying the indicator approach the following questions need to be addressed and a set of guiding principles followed:

- How will each indicator be applied? That is, will it be applied as an absolute measure or as a comparative measure (eg., among states). Will it relate to a point in time or used to examine change across time?
- For what values of the indicator will it be concluded that supply is not adequate?
- What is the relative weight that will be attached to each indicator in making an overall judgement on the adequacy of current supply?

It also needs to be acknowledged that in most cases for the indicators currently used by AMWAC, there are no agreed or acknowledged benchmarks, or thresholds, etc. to guide interpretation and judgement of the available data. For example with surgery waiting times, there are no nationally agreed benchmarks of what constitutes an acceptable threshold for waiting and/or clearance time. However, the ongoing development of guiding principles should ensure that judgements are made uniformly across workforce reviews and by working parties. It is also important to ensure transparency in assumptions and judgments. In addition, it should be noted that the AMWAC/stakeholder workshop concluded that establishment of a set of adequacy benchmarks values and weighting is not currently possible for all indicators, and that as such for the time being AMWAC judgment will still be necessary in some instances.

One final point to note is that it is important to be able to discern if an indicator is providing evidence of an overall workforce shortage/surplus or more an indication of workforce distribution problems. Again this distinction may not be easily made but it is a key consideration in adequacy analysis. Distribution will be important in terms of both state/territory and urban/rural/remote.

The set of indicators that can be applied to assess medical workforce adequacy are:

- a. Unfilled positions;
- b. Elective surgery waiting time/clearance time;
- c. Consultation waiting time and patient access;
- d. Excessive hours of work;
- e. Price of service/level of copayment;
- f. Practitioner/population ratio;
- g. Service substitution;
- h. Quality of service provision;
- i. Referring practitioner assessments;
- j. Consumer and carer assessments; and
- k. Views of practitioners in the workforce under review.

The availability and reliability of, data to assess indicators *a* to *h* varies. Indicators *i* to *k* are qualitative assessments. Whilst the robustness of qualitative data and attitudinal assessment can be open to scrutiny, the importance of input from these sources should not be undervalued in any assessment process that has a consultative process as a key aspect of its approach. Ideally the indicators should be applied at the national, regional and local level to ensure more localised factors are not missed in any adequacy assessment. Data availability can preclude this occurring in some cases.

a. Unfilled positions

There are several sources of vacancy information that can be utilised. For the specialist workforce the indicator used is public hospital vacancies. The other relevant indicator, applicable to both workforces, is the use of temporary resident overseas trained doctors.

AMWAC defines a vacancy as an approved position, for which funding is available and for which recruitment action is currently underway or has been undertaken but been unsuccessful.

The hospital vacancy data is sourced from the periodic survey by AMWAC of State/Territory health departments of public hospital vacancies for staff specialists, visiting consultants and trainees across each specialist discipline. Data on vacant positions filled by temporary resident doctors is also collected. The survey is usually conducted in the third quarter of the year. Previous surveys have been undertaken in 1996, 1997 and 2001. The response rate does vary and despite seeking information by head count and full time equivalent most organisations only provide head count information. The data provided is point in time, but trends overtime can also be examined. Each of these factors places some limit upon the reliability of the data. Despite this the indicator can be considered to provide a clear indication of shortage.

The assessment should be based on the total number of vacancies and the proportion this level of vacancy represents of the total workforce. As there is poor information on the size of the hospital workforce, often this proportion can only be calculated with reference to the total workforce. In this case this will have the effect of understating the hospital vacancy rate.

The total number of vacancies can be considered a reliable indicator of immediate shortage as these are funded positions which would be filled if people were available and willing to fill them.

Vacant positions filled by temporary resident doctors provide a further indication of potential shortage and difficulties associated with filling positions. These are positions being filled on a temporary basis for a defined period which would otherwise be filled by an Australian trained doctor if one was available and/or interested in working in the vacant position.

Therefore the total number of vacancies comprises vacant hospital positions plus positions filled by temporary resident doctors. This total can be transferred to any workforce projection model and used in the projection analysis by starting the workforce as being under supplied by the number of total vacancies.

If there are reported vacancies but all other indicators suggest a workforce is at least adequately supplied, the vacancies may be more an indicator of workforce maldistribution problems rather than an overall workforce shortage. Factors influencing this could be employment conditions and a desire not to work in particular locations.

This indicator uses point in time information but it is also possible to assess trends over time and differences among geographic areas and states/territories.

b. Elective surgery waiting list/clearance time

This is a relevant indicator for surgical workforces. It is most useful as a guide to possible workforce shortage. Data on hospital waiting lists, waiting times and clearance times are compiled nationally by the AIHW from information supplied by State/Territory health departments. Timeliness in providing the relevant information can vary. In addition, relativities in waiting times across specialties have not, to AMWAC's knowledge, been assessed; nor have national benchmarks on accepted waiting times across specialty relativities or individual specialty levels been established. In turn, this means that currently any waiting time assessments will rely on judgement rather than the strict application of a universally agreed set of benchmarks.

In terms of waiting time, AMWAC attaches most weight to urgent times. This is the priority for any health system and for any individual medical practitioner. Non-urgent surgery is considered to be just that - specifically elective and of a non-urgent nature. To create a workforce to clear non-urgent surgery waiting lists or to reduce non urgent surgery waiting times to close to zero could create a long term oversupply in the workforce. Waiting times are also viewed with some caution compared with some of the other available indicators. This is mainly because they are a function of multiple factors from which the precise impact on workforce supply is difficult to determine and quantify. For example, waiting times would be influenced by funding, hospital capacity, hospital management, access to services, patients' preferences and workforce supply.

It will be difficult to determine a precise threshold at which waiting times should be considered to indicate a shortage and this is likely to also vary from discipline to discipline. For each medical discipline it should be possible to identify sentinel events which should have minimal waiting time and assess these against actual waiting time. Consideration of distribution issues will also be important.

This indicator uses point in time information but it is also possible to assess trends over time and differences among geographic areas and states/territories.

c. Consultation waiting time and patient access

Information on consultation waiting times is not part of any established national data collection. Currently, AMWAC attempts to collect this information through a survey of individual profession members as part of a workforce review. Data has been collected for an urgent condition and a standard consultation. Sentinel events or conditions are used to define urgent and standard. The sentinel events are determined by the working party for the discipline under review. For example, in the gastroenterology workforce review the working party defined rectal bleeding or recent onset dysphagia as clinically urgent conditions, while dyspepsia or chronic abdominal pain were considered to be non-urgent conditions (for a standard consultation).

Information can also be collected on the ability of consumers to access a consultation. The relevant indicator would be whether access has been closed to new patients and the reasons for any closure. Analysis of the proportion of new consultations to repeat consultations can also be undertaken.

This indicator is based on point in time data, but again trends over time and across geographic locations and states/territories would also be available.

The comment above in relation to urgent times being the main focus is also relevant here. Again no national benchmarking work has been undertaken to define the level at which the wait for an urgent consultation should be considered evidence of a workforce shortfall.

d. Excessive hours of work

The data is sourced from the AIHW national medical labour force survey and is usually considered in the context of average hours worked in the workforce under review compared with hours worked in all specialties, and the proportion of the workforce working excessive hours. Excessive has never been defined, but relevant levels considered by AMWAC are over 60 hours per week and over 80 hours per week. There are no definitive guidelines to guide judgement as to what proportion of the workforce working over 60 hours per week and over 80 hours per week should indicate a workforce shortage. Generally AMWAC would consider 20% of the workforce working over 80 hours per week as a potential indicator of a workforce shortage.

Safe hour benchmarks, if specifically mandated by regulation or rigorously determined, may also be considered in this analysis. The key factor would be the proportion of the workforce working above the safe hour limits.

Again, this information is point in time, with trends overtime and differences among states/territories and geographic location also available.

e. Price and copayment analysis

Price and copayment analysis could provide additional information on the adequacy of the workforce (Patterson 1994). In the past AMWAC has not used this indicator, but recognises that in line with the AMWAC Review recommendations price analysis will be employed in future workforce reviews. However, it should be recognised that AMWAC has been aware of other studies that have used this approach and to date their conclusions about workforce adequacy have not been noticeably different from AMWAC's (AMWAC 2000.)

Medicare data is the main source for price information. The proportion of a workforce bulk billing consumers can also be considered.

As with other adequacy indicators, there is no definite threshold or benchmark at which a level of copayment would indicate a workforce shortage.

Again, this information is point in time, with trends overtime and differences among states/territories and geographic location also available.

f. Practitioner/population ratio

The measure is only used in the context of established best practice or sustainable practice benchmarks. The method involved is to assess current workforce supply against pre-determined or established benchmarks. Other than this, doctor population ratios are only a useful descriptive tool, in the context of geographic or locational comparison, rather than an indicator of workforce adequacy.

Sustainable practice guidelines for most of the main specialist workforces were compiled by AMWAC, in consultation with the health departments and the profession, in 1998 and published in the AMWAC report – *Sustainable Specialist Services: A Compendium of Requirements* (AMWAC 1998). AMWAC intends to update this compendium at regular intervals.

This measure can be applied at the national, state/territory or regional level. These measures can then be compared with each other to allow for geographic comparison. They can also be compared with any established benchmark to assess shortage or oversupply. However, the established benchmarks need to have been rigorously determined. Any comparison with international benchmarks need to be made with caution, or modified for Australian use, due to differences in health service arrangements, policy guidelines, practice, health priorities and financing. Generally the only country that closely equates with Australia for comparative purposes is Canada (due to the similarities in terms of service organisation, financing, training and geography).

This indicator is best employed as a point in time measure; however, if there is a consistent database of information, across time comparisons can also be undertaken.

g. Service substitution

This indicator is based on an assessment of the extent of total supply of a service provided by general practitioners s/specialists whose main area of practice is not the supply of that service. For example, in the review of the anaesthesia workforce, a high proportion of anaesthetic work undertaken by general practitioners, especially in rural areas, may indicate a shortage of anaesthesia specialists in those areas. However, it is difficult to separate the proportion of this substitution which may be due to insufficient workforce numbers as opposed to maldistribution and/or lack of positions/inadequate population base and infrastructure to maintain a specialist practice in some areas.

This measure has been used in some AMWAC reviews where substitution of the service is likely to be a relevant consideration. Medicare is the best source of data for cross medical discipline comparison. Across profession information may be difficult to obtain and would probably need to be sourced from state/territory hospital and service utilisation data.

h. Quality

Quality is recognised as being a potentially important consideration but the workforce review process does not currently make any defining judgements on quality other than to note its importance to good clinical practice. How to incorporate quality indicators into adequacy assessment will require further development. AMWAC recognises it will need to work with key national bodies such as the Australian Council for Safety and Quality in Health Care and the National Institute of Clinical Studies on this issue. This will need to involve defining the impact of workforce supply on quality and service delivery and the development of appropriate data collections.

i. Assessment of referring practitioners

Given that the pathway to specialist access can be via a general practitioner referral, AMWAC considers that general practitioner assessments of access issues is a useful indicator of adequacy.

For AMWAC specialist workforce reviews, information on this indicator is generally obtained by surveying the Divisions of General Practice. The Divisions are asked for their assessment of the adequacy of the particular specialty under review in order to determine whether they feel there is an adequate supply of these specialists within their geographic area, and, further, whether the waiting times for their patients to see these specialists are reasonable. Factors other than specialist workforce numbers may influence the reliability of this indicator. For instance, the geographic location of a general practitioner may preclude a particular type of specialist being available in the geographic area, due to limiting factors such as inadequate population base and/or infrastructure to support a specialist in that location. Therefore this indicator has to be considered in conjunction with other factors, such as the sustainable practice guidelines for the specialty under review.

Again, this information is point in time, with trends overtime and differences among states/territories and geographic location also available.

j. Views of consumer organisations

Consumer assessment is also considered an important component of adequacy assessment. Consumer assessments are a potentially valuable tool in the context of their first hand experience in accessing health services and can be valuable in providing a cross reference to the quantitative indicators and the views of the medical practitioners on their workforce. Further work will be necessary to develop an approach for regular consumer input to the assessment process.

k. Views of practitioners

The practitioners themselves are in a unique position to assess the adequacy of their workforce, based on their patient loads, waiting lists, working hours, work related stress levels, and other factors related to workload. In addition, their direct link to patients requiring their services provides them with an insight into the difficulty and/or ease with which patients are able to obtain their services.

For AMWAC workforce reviews the opinions of practitioners are obtained through a survey of the members of the profession under review. As with the views of referring practitioners, the opinion of specialists must be carefully considered in the context of other factors, such as location of practice.

Table 7 summarises the previous discussion and includes a general guide as to how particular indicators can be applied to adequacy analysis. It is recognised that as further work is undertaken on the application of these indicators and the establishment of more precise thresholds for their application this section will be updated.

Table 7: Summary of indicators of medical workforce shortage and oversupply

Indicators of shortage	Indicators of oversupply	Indicators of a workforce in balance
<i>Unfilled positions</i>		
- unfilled public hospital positions	- limited or no unfilled positions	- low level of public hospital vacancies
- high use of temporary resident doctors	- limited or no use of temporary resident doctors	- low usage of temporary resident doctors
<hr/>		
<i>Elective surgery waiting times</i>		
- unacceptably long urgent waiting times	- no wait	- low waiting times
<hr/>		
<i>Consultation waiting times</i>		
- unacceptably long waiting times	- no wait	- low waiting times
<hr/>		
<i>Excessive hours of work</i>		
- high (over 20%) or an increasing proportion of practitioners working in excess of 80 hours per week	- virtually no practitioners working excessive hours	- long hours or short hours are worked by choice and not necessity
<hr/>		
<i>Price of service/level of copayment</i>		
- services priced significantly above average	- prices significantly below the average, with high adherence to a floor price	- prices of services neither at the floor price nor at a level which discourages patient attendances
- level of Medicare bulk billing below average	- supplier induced demand and overservicing	
<hr/>		
<i>Service substitution</i>		
- substitution of services by alternative providers or an increasing use of alternative providers	- declining patient numbers	- limited substitution
	- underemployment and insufficient work/variety of work to maintain skills	
	- growth in marketing effort	
<hr/>		
<i>Practitioner/population ratio</i>		
- doctor provision well below any determined national benchmark	- doctor provision well above national benchmark	- a 'lean' workforce in line with any determined national benchmark
- growth of the workforce well below population growth	- growth of the workforce well in excess of population growth	
<hr/>		

Table 7: Summary of indicators of medical workforce shortage and oversupply continued

Indicators of shortage	Indicators of oversupply	Indicators of a workforce in balance
<i>Assessment of referring practitioners</i>		
- opinion indicating an insufficient number of specialists to refer to and/or excessive waiting times for patients to see specialists		- opinion indicating an adequate supply of specialists available to refer patients to and/or little waiting time for patients to see specialists
<hr/>		
<i>Assessment of consumers and carers</i>		
- high level of dissatisfaction with access	- no dissatisfaction with access	- limited dissatisfaction with access
<hr/>		
<i>Views of practitioners</i>		
- high levels of dissatisfaction	- insufficient workload to maintain specialist practice	- satisfaction with working hours and patient load
- inability to meet population demand		
- stresses from over work		

Source: AMWAC

6. MEDICAL WORKFORCE PLANNING – PREDICTIVE ANALYSIS

This chapter has two main sections - predicting workforce supply and predicting workforce requirements. The dynamic nature of service provision and workforce requirements are also discussed. Once again, the information provided here draws on the AMWAC approach to undertaking these planning activities.

Predicting Future Workforce Supply

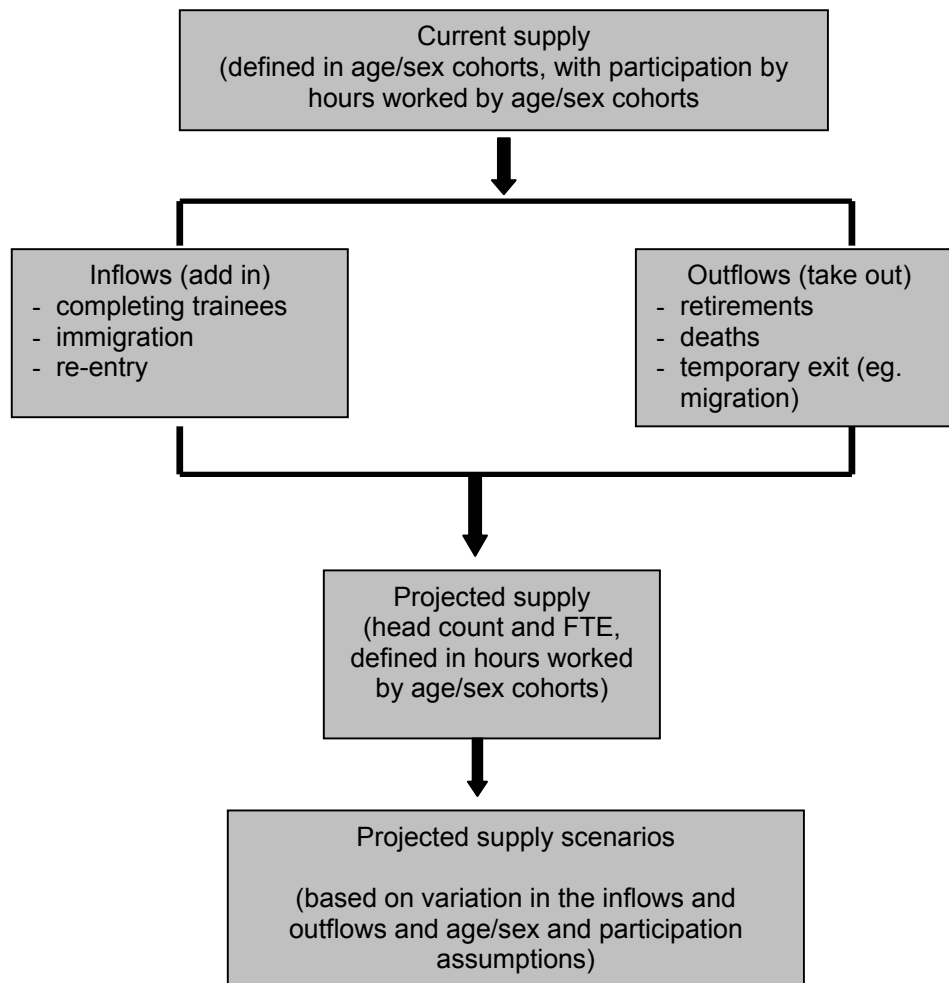
Future workforce supply is estimated by starting with the current (baseline) workforce as indicated in Chapter 3 and adding in anticipated additions to the workforce and subtracting anticipated losses from the workforce, within each five-year age and sex cohort. Workforce supply is projected forward using both a head count and a FTE estimate based on hours worked.

Workforce entrants and losses are allocated by age and sex cohorts. This is important to ensure that variations in hours worked across the different age and sex cohorts are taken into account. This baseline supply profile is then projected forward over the selected timeframe (eg. ten years) to provide an estimate of the future workforce supply and its key characteristics (defined in terms of age, gender and participation in hours worked).

In undertaking these predictive analyses, AMWAC frequently models various supply scenarios. For example, an increase/decrease in the average hours worked by the total workforce or by segments of the workforce, or an increase/decrease in new entrants from migration or the gender mix of the workforce. It is important to outline in detail the assumptions used in modelling each supply scenario. It is also important to recognise that any workforce is dynamic and as such supply changes need to be regularly monitored to check that the anticipated adjustments used in the workforce modelling are not deviating significantly from reality.

Figure 1 summarises the AMWAC approach to projecting medical workforce supply.

Figure 1: Summary of the AMWAC approach to projecting medical workforce supply



Source: AMWAC

Predicting Future Workforce Requirements

Workforce requirements analysis also provides information on the demands that are, and could be, made of the workforce. It essentially involves an assessment of future workforce requirements.

There are essentially five broad approaches to workforce requirement analysis and the projection of likely future scenarios, viz., models of care, needs based, utilisation based, effective care/demand, and effective infrastructure. The approach used for predicting requirements will depend on the workforce under review and to some extent data issues can also influence which approach is used. This can mean that if workforce planning is being undertaken at the discipline level approaches to requirement analysis can sometimes vary. A mix of the approaches can also be considered. Each approach will usually allow for an assessment of age and sex specific population service requirements

and may involve an estimate of population health deficits. In undertaking any requirement analysis, it should be possible to describe and quantify requirements in the current time period, undertake an assessment of past trends, and project likely future scenarios. Again in projecting, the thinking and assumptions behind each requirement scenario must be explicitly outlined.

Models of care

This approach to requirement analysis is particularly suited to workforce planning along streams of care, eg. emergency care, aged care, cancer care. This approach involves consideration of preferred patient outcomes and then the use of this information as the basis for defining an optimal model(s) of care. Once the model(s) of care is defined, the workforce supply and mix can be determined. This approach should allow for consideration of future workforce supply in a more integrated manner across all health workforces involved in the delivery of particular streams of care.

Needs based

Workforce supply and mix is linked to an assessment of population need (note this is need not demand), where the determined population need is made consistent with a level of service and workforce provision. This approach can be used for individual disciplines or applied to integrated health workforce planning.

Utilisation based

This approach uses current service provision data on the quantity and mix of services that are being provided by a particular workforce as a proxy indicator of need. This is not as ideal as a strict needs based assessment because current utilisation may reflect supply factors (if there are constraints on supply or problems with providing an adequate supply) rather than the real need for services.

Effective need/utilisation

This requirement assessment approach places fiscal constraints on the assessed level of need/utilisation; allowing consideration of the financial ability of the economy and health system to meet health care requirements to be factored into the workforce analysis and planning.

Effective infrastructure

This approach is applicable in specific instances where the available infrastructure will act as a constraint on service provision and workforce supply. This will occur when service provision occurs within a defined environment, for example an emergency department or intensive care unit, or with specific equipment, for example megavoltage machines. The reasoning is that there is little point in having a workforce greater than the physical capacity of the health system to gainfully employ or use that workforce.

To date, AMWAC has generally used a population needs based model and/or a utilisation based approach in predicting future workforce requirements; and where applicable the

effective infrastructure methodology has also been employed, for example in the reviews of the emergency medicine, intensive care and radiation oncology workforces. AMWAC has previously noted that as a broader information base on health outcomes and quality practices becomes available, it should be possible to link outcomes and quality to ideal models of care which can then guide health service provision and as part of this workforce planning and workplace organisation. In turn, this should ensure that workforce planning is better integrated into broader health system planning covering models of care and service delivery developments. This approach should be viewed as an important goal to work towards.

Each requirement analysis approach has at its core the key questions of what services are being provided, to whom, at what time, and in which manner; and, in some cases, with what outcomes. Therefore for each of these approaches outlined above a range of factors may need to be assessed and integrated into the requirement analysis. These factors include:

- population;
- disease incidence and prevalence;
- demand for health services;
- the funding and availability of, and access to, health services;
- service utilisation;
- service standards;
- health prevention strategies;
- health outcomes;
- service policy and planning frameworks;
- technology induced changes; and
- consumer expectations.

Of the above factors that may need to be assessed in the requirement analysis, the key factors most often considered in AMWAC specialist workforce reviews have been:

- a. population growth estimates, by relevant age and sex cohorts when appropriate;
- b. disease incidence;
- c. service utilisation;
- d. service standards;
- e. service policy and planning;
- f. technology induced changes; and
- g. consumer expectations.

a. Population growth estimates

The projected change in population is considered to be the minimum relevant input to predict future service requirements for the workforce. This indicator is best applied by considering the projected change in the target population most likely to use the services of the particular workforce under review. For example, for the specialist obstetric workforce the projected population growth in females of child-bearing age would be the target population. The information on projected population growth is sourced from the Australian Bureau of Statistics, using series that assume constant fertility and low net migration. An

additional weighting for population ageing may also be included in the analysis where appropriate. For most medical workforces, this is an important consideration given that health care service utilisation tends to increase with increasing age.

b. Disease incidence

Trends in disease incidence may be very useful for some workforces, as treatment for certain diseases may be directly linked to a specific specialist services. For example, trends in coronary heart disease can provide an indication of possible trends in requirements for cardiothoracic surgeons.

While the exact impact of disease incidence and trends on future requirements may be difficult to quantify, these measures provide a useful indication of possible future trends in population requirements.

c. Service utilisation

Service utilisation trends, based on recent years, may be used as another indicator of potential future growth in requirements, on the assumption that past trends can be expected to continue in to the immediate future. Clearly, a steady increasing/decreasing historical trend in services would provide a more reliable indicator than an erratic pattern in the number of services. In addition, in examining utilisation data it is important to consider, where possible, any other factors that may have influenced the trend besides population need, such as the addition or deletion of Medicare items during the time period for which data are available.

It is possible to estimate future service requirements by combining national hospital morbidity data on number of separations with population growth estimates by age and sex cohort. The actual number of expected patient separations, by age and sex, may be projected into the future by applying historical utilisation/patient separation trends to population growth rate estimates.

d. Service standards

On occasions, service standards can be considered in the future requirement analysis, where established standards or benchmarks are related to service provision. For example, this could relate to the proportion of specialists required to work in emergency departments or intensive care units.

e. Service policy and planning

This information is generally sourced from Commonwealth, State and Territory health departments. It is used as a guide to likely changes in service delivery arrangements and infrastructure and can be overlaid with information about service utilisation and population changes. Other factors that can be considered here can include changes in funding or health financing arrangements and changes in health insurance status.

f. Technology induced changes

The impact of technological change remains a difficult assessment to make. This involves considering new techniques, new equipment, new treatments, and their impact on the health system and the health workforce. In a conceptual sense it is recognised that technological change is inevitable and it will affect the workforce. Often the emerging impacts are identifiable. What is difficult in the planning context is assessing when the affects will be felt and quantifying, in advance, the impact on the workforce and in the workplace. Two general approaches can be used. The first approach attempts to outline technological change and assess the impact of the change. The other approach acknowledges potential technology impacts, but does not project an effect of this change. Instead this approach will wait for an evidence base on which to make assessments of the impact of the change before incorporating the change into any workforce modelling. The effects of technological change may include increasing or decreasing practitioner productivity, by increasing or decreasing the time required to undertake certain procedures etc., broadening the types and sophistication of procedures and treatments available, and/or increasing substitution by allowing other types of practitioners to perform particular services.

The AMWAC workforce reviews have in the past noted recent and/or upcoming technological change relevant to the workforce under review, while acknowledging the difficulty associated with assessing the impact. However, the AMWAC reviews have not attempted to quantify the expected impact of new technologies and work practices on workforce requirements. Regular updating of the reviews is seen as allowing plans to be adapted as new trends emerge. However, in some instances it may be possible and useful to model various workforce requirement scenarios using a 'technology-weighting' in a similar manner to the way in which AMWAC currently applies a population age-weighting when projecting future workforce requirements for some workforces.

g. Consumer expectations

Issues assessed include consumer expectations about level of service provision, access to services and views on future service delivery arrangements. These assessments are qualitative but remain important to the overall thinking about future requirements.

Workforce Prediction - A Dynamic Process

Health systems and health workforces are dynamic and constantly evolving. This has two key impacts on the workforce planning predictions. First, the impact of any broad health policy, service delivery, and/or technology change on the workforce need to be considered as part of the supply and requirement projection process. These impacts can be considered in terms of anticipated changes or simulated adjustments. The second consequence of the dynamics of health systems and the health workforce is that there will be a need in any planning exercise to constantly monitor, update and refine the workforce analyses and planning advice.

In terms of dynamics, several basic health care system trends seem likely, and all imply an innovative and constantly evolving workplace and workforce. These trends are:

- more and better technology;
- new and varied approaches to service delivery and the provision of care;
- new disciplines and new roles for old disciplines;
- a continued focus on quality and cost management;
- increased consumer participation;
- greater availability of information;
- continuing demographic shifts; and
- the continued development of the global community.

Overall, from the workforce planning perspective any health policy, service delivery or technology change must be quantifiable in terms of an impact on demand, productivity or practice, or a combination of all three.

7. MEDICAL WORKFORCE MODELLING – THE SPECIALIST MEDICAL WORKFORCE CALCULATION TOOL

A computer simulation calculation tool (based in Microsoft Excel) is used by AMWAC to model the workforce and to project future workforce supply and requirements. The calculation tool and the associated modelling process were designed and developed in 1995 by Dr Ron Van Konkelenberg from the consulting firm Fresbout Consulting Pty Ltd. Throughout this document the calculation tool and the associated underlying modelling process are referred to as the AMWAC projection 'model'. A description of the model and its inputs is provided below.

It is recognised that there are other workforce modelling tools being used in Australia to predict workforce requirements and supply. These include the model developed by:

- the Australian Research Centre for Population Oral Health and the AIHW Dental Statistics and Research Unit of the dental workforce (AIHW 1998);
- Access Economics for the Australian Medical Association's review of the general practice workforce (Access Economics 2002); and
- the Department of Education, Science and Training of the nursing workforce (Karmel and Jianke 2002).

The AMWAC workforce calculation tool models the workforce under review and projects supply and requirements forward for up to a 12-year period, on the basis of five year age and gender cohorts.

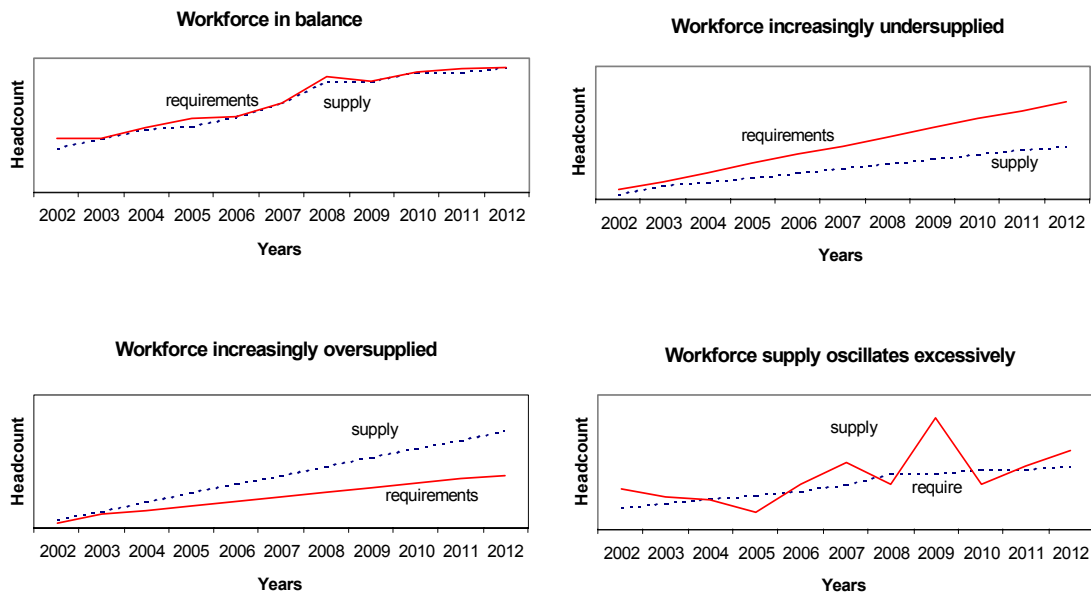
There are three major components to the modelling process. The first is a detailed profile of the current workforce, new entrants to the workforce and losses from the workforce. This profile is informed by the descriptive analysis of the workforce as outlined in Chapter 4. The second component is a supply trend and the third component is a requirements trend, both of which are based on the predictive analyses as outlined in the previous chapter. A comparison of these two trends provides a description of the workforce balance/imbalance throughout the projection period.

This modelling process can provide analyses, which show the relationship between workforce supply and requirements as:

- balanced – where supply and requirements are approximately equal during the projection period;
- increasingly under supplied – where supply is consistently less than requirements and the gap is increasing;
- increasingly over supplied – where supply is consistently higher than requirements and the excess is increasing;
- oscillating excessively – where supply trends fluctuate excessively above and below requirements trends.

These workforce trends are illustrated below in figure 2.

Figure 2: Examples of the different relationships between workforce supply and demand – balanced, under supplied, over supplied and oscillating



Future requirements are projected by applying a growth factor to the baseline requirements level. This growth factor represents an indication of the predicted change in requirements during the projection period. The growth rate is influenced by a variety of factors, including projected population growth, the effects of ageing of the population, health expectations, technological changes, disease incidence, and trends in service utilisation. While some of these factors are not readily quantifiable, they may be contextually useful.

As previously indicated, the modelling process uses hours worked for measuring supply and requirements. Using hours worked allows the model to take into account variations in working patterns and entry and loss rates among the different age and sex cohorts. In addition, using hours worked as a measure overcomes the difficulty of defining what an FTE represents in terms of hours worked per week. Hours worked per week may then be converted to headcounts and/or FTEs, as required, using whatever definition is appropriate to the workforce.

The base year for the projections is the current year and inputs include information to describe the age and sex profile of the current workforce. Supply and requirements are projected ahead for a 12 year period, starting from the base (current) year plus 11 years. The spreadsheets from the Excel model show the balance for individual years during this period. AMWAC workforce reviews have generally shown results for a ten year period.

Throughout the projection period it is assumed that the behavioural pattern of the current workforce, including hours worked and entry and loss rate by age/gender cohort, remains

the same throughout the projection period. For example, if those in the lower age groups work, on average, more hours per week than those in the higher age groups, this would be retained in the projection.

In addition, the age and sex specific loss rates (attrition rates) remain the same throughout the projection period. However, while the loss rates for each cohort remains constant, the total number leaving the workforce can also vary. For example, if it is assumed that the majority of losses are in the higher age groups, and the ageing process and entry of students is not sufficient for replacement, the total losses will decrease as the workforce becomes younger.

The modelling process allows for the exploration of the balance between supply and requirements by modifying key assumptions, including:

- *Requirement trends.* Workforce requirements vary depending on the potential for substitution between workforce categories, availability and funding of facilities and services, and epidemiological and technological trends in the discipline under review.
- *Workforce participation and retention assumptions.* Workforce participation and retention trends can vary depending on working conditions and the professional or lifestyle expectations of workforce participants.
- *Net migration.* Net inflows in a particular discipline are directly controlled by government policy and/or funding programs. Out migration is included in workforce participation and retention assumptions.
- *Intake numbers.* The number of graduates in disciplines is determined by the schools/colleges and the availability of funded training places.

The specific assumptions that can be varied to achieve a balance between requirements and supply in the workforce are discussed below.

Requirements

The modelling process defines current requirements as the baseline workforce supply plus/minus any existing over/under supply. Estimated future requirements are calculated by applying a compound growth factor to the baseline requirements. Requirement trends are determined on a year by year basis by multiplying the requirements (including any shortage/oversupply) in each year by $(1 + \text{compound growth proportion})$ to obtain the following year's requirements.

The annual compound growth factor applied to the requirement trend is a key input into the model. The factor represents an indication of the predicted estimated change in requirements during the projection period. To determine an appropriate growth factor, a range of indicators are considered, as outlined in the first part of this chapter.

Supply

The current (baseline) supply is divided into five year age/gender cohorts from 20-24 years through to 70+ years. The model allows use of a non-working pool if this is considered appropriate, however this has not been applied in the medical context.

For each age/gender cohort the workforce supply in each year is estimated by starting with the previous year's workforce, adding graduating students entering the workforce and net migration (positive for net inflows, negative for net outflows), and subtracting losses (permanent exits from the workforce, such as deaths and retirements, and temporary movements out of the workforce). A fifth (20%) of each cohort is moved to the next cohort to age the workforce.

Workforce supply is measured in headcounts, FTEs, and hours worked per week according to the relative contributions of each age/gender cohort. FTEs are calculated for each age/gender cohort as the headcount multiplied by the average hours worked per week by that cohort, divided by the average hours worked per week for that particular workforce, in total.

The following assumptions are used to define the workforce supply:

- the year for which supply data are compiled (current/base year of projections);
- total size of the workforce, and number of practitioners by age/gender cohort;
- average hours worked per week by age/gender cohort;
- annual losses from the workforce for each age/gender cohort;
- annual net migration into or from the workforce for each age/gender cohort; and
- age/gender of graduating students.

In addition to the above, the following assumptions are optional and may be used (both must be entered in the model if used): non-working pool (an estimate may be used); and re-entry from the non-working pool (the model converts numbers to rates to ensure re-entry is related to size of this pool).

In order to simulate varying supply trends and model workforce losses and entries, the following assumptions regarding graduates and workforce dynamics are inputs into the modelling process. (The default value for each is noted in brackets beside it.)

Other components of the model include the full time equivalence conversion factor, where standard hours worked per week (default=system standard) is used to compute full-time equivalence rates. The weekly average total number of hours worked can be adjusted to allow for annual leave and/or sick leave etc. (such adjustments are automatically reflected in both the requirements and the supply trends). Workforce participation levels can also be modified, by varying the actual hours worked per week (where the default is 0) or adding in a variation in hours worked to demand (again the default for this assumption is 0).

Graduates:

- number of graduates by year (default = sum of last year for each future year);
- proportion of graduates entering the workforce (default = 1);
- proportion of graduates entering the non-working pool (default = 0); and
- proportion of graduates leaving Australia (default = 0).

Workforce dynamics:

- total losses (default = sum of last year);
- total net migration (default = sum of last year);
- total re-entry (if non-working pool is used – default assumes pool not used);
- +/- workforce loss rates (default = 0);
- +/- workforce re-entry rates (default = 0); and
- +/- workforce migration rates (default = 0).

The adequacy of the base year supply is estimated and any over/under supply is input into the model. The default value is 0 (no current under/over supply). A series of indicators is examined to determine the initial over/under supply to be included (as outlined in Chapter 6). If the current workforce is assessed as meeting current requirements then it is assumed that the current workforce is in balance and requirements equal supply. If the evaluation of workforce adequacy indicates that an under or over supply situation exists then as far as practicable this needs to be quantified in terms of FTEs. This estimate is then taken into account when calculating future workforce requirements through adjustments to the baseline supply figure.

Projection Ranges, Statistical Variance And Sensitivity Analysis

For each workforce a range of projection scenarios are developed. These projections show the range of variability and/or the extent of uncertainty in the underlying assumptions used. It is important to develop projection ranges due to:

- statistical variability in requirements and supply data;
- lack of accurate, available data required for the model;
- uncertainty regarding key projection assumptions; and
- lack of consensus regarding a definitive method for estimating requirements.

The sensitivity analyses and number of individual projections for each workforce category is dependent on the time available for the project and the requirements of the workforce category under review. At a minimum, at least two scenarios are generated for each workforce. These include the status quo, or base model, which extrapolates the impacts of demand and supply trends continuing without intervention, and a supply in balance model, which adds a pattern of additional student intakes required to match supply to requirements.

Alternative projections and projection ranges are generated by varying requirements and supply assumptions/inputs. There are two related approaches:

- *Statistical variance.* Where assumptions are based on statistics with known statistical variance the upper and lower projection limits are generated by replacing standard assumptions with +/- 95% confidence limits. All assumptions are varied simultaneously.
- *Sensitivity analysis.* Where the accuracy of assumptions is not statistically defined high and low projection limits are generated by replacing standard assumptions with a selected multiple of the assumption. Each assumption is separately tested to assess the relative impact of uncertainty for the given amount of variation. If time permits a series of changes are introduced to assess the range of variations over which the assumption remains constant. (This is a markov process.)

Balancing Supply And Requirements

The results of the model's simulation are used to make recommendations regarding adjustments required to create a sustained balance between workforce supply and requirements, by the tenth forecast year. Generally a number of scenarios are modelled by varying both the supply and requirement inputs, although AMWAC has usually provided advice to government on a single, recommended, scenario. This will be changing in line with the recommendations of the AMWAC Review that a number of scenarios now be included in each workforce review (AHMAC 2002).

The option generally used to achieve balance of supply with requirements is the number of graduating students/trainees. However, requirement trends are also explored in particular to determine if substitution between workforce categories is possible.

Additionally changes in working conditions can influence workforce participation rates (hours worked) and workforce dynamics (loss and re-entry rates). These factors are explored to determine if balance can be achieved without additional training and/or if underlying trends require proactive management of the workforce.

While stakeholders should aim to meet or exceed AMWAC's workforce recommendations, due to the inherent limitations of all forms of workforce planning, an upper and a lower acceptable supply level can be identified to set a range over which variation from recommendations are acceptable. This could be necessary to take into account issues of training infrastructure establishment and funding.

A copy of a theoretical workforce modelling exercise using the van Konkelenberg model is provided in Appendix C. This provides an example of how the AMWAC calculation model works.

8. STRATEGIC OPTIONS FOR CORRECTING WORKFORCE IMBALANCE

As part of developing the agreed workforce plan for the future there are several options available to policy makers to correct for workforce imbalances and ensure supply and requirements 'balance'. Over time, implementation of these strategies will minimise supply shortages and surpluses and at the same time meet anticipated requirements. The main strategies are:

- adjust education and training intake;
- increase participation rates;
- reduce workforce loss;
- encourage workforce re-entry (for shortages) or early exit (for surpluses);
- adjust net migration;
- encourage adjustments in workforce productivity;
- improve workforce distribution;
- redesign workforce tasks to vary the combination of skill mix and professions; or
- influence consumer behaviour.

Each of the above strategies is discussed below. Note this discussion does not include a summary of current Commonwealth/State/Territory health workforce policies and programs. This information will be available in a separate publication being prepared by AHWOC – *The Stocktake of Jurisdictional Investments In Health Workforce* (forthcoming).

Adjust education and training intake

Currently, the main strategy used by AMWAC to adjust for workforce imbalance is to influence the supply of doctors by recommending a change (increase or decrease) in the number of vocational training places for a particular specialist workforce. The resulting impact is an increase or decrease in the supply of the specialist workforce. This option is preferred because training intake can be directly influenced, and there is a direct link between the output of a vocational training program and future workforce supply. This adjustment also provides potentially the greatest long term impact on supply. The drawback with this approach is the comparatively long lead time between adjusting training intake and the completion of training.

Implementation of recommendations to increase or decrease the number of training positions is the responsibility of state/territory health departments, who work with the relevant professional college to ensure that the adjustments are made. This implementation process is overseen by AHWOC. Factors such as the existing supply of specialists available to oversee the training, and the number of facilities with available capacity (both in terms of infrastructure, and appropriate patient and case load) need to be considered. Even if the number of training places has been increased, there may be difficulties with increasing supply if insufficient and/or unsuitable applicants are applying to enter the training program.

It should also be noted that often a workforce imbalance is not necessarily about total workforce supply, it is often about appropriate distribution of that supply. Adjusting

education and training intake is a global measure aimed at increasing total workforce supply but it does not necessarily influence distribution. As such this strategy may need to be implemented in conjunction with some of those listed below.

Participation rates

Increasing participation rates is a supply side adjustment, whereby the existing workforce would increase their hours worked. This would have the impact of increasing supply, without increasing the total workforce size.

Adjustments to participation rates may be influenced by policies and programs which provide incentives for practitioners to work longer hours. These may include improvements to working conditions, increasing practice support, and tangible rewards such as financial incentives.

Reduce workforce loss

Workforce loss may be defined as a reduction in the number of practitioners exiting the workforce (due mainly to retirement or movement overseas).

Strategies to reduce workforce loss would involve any policies or programs aimed at encouraging practitioners to stay in the workforce and may include programs to discourage a move to part time or reduced hours of work. Examples would include measures to improve any problems in the work place or with the quality of work life, such as support programs for those practising in rural and remote areas, as well as tangible rewards such as financial incentives to remain in practice.

Encourage workforce re-entry (for shortages) or early exit (for surpluses)

Mechanisms to encourage re-entry are aimed at encouraging appropriately trained practitioners who are not currently practising, or have temporarily left the workforce, to re-enter the workforce. Strategies to encourage early exit from the workforce are aimed at reducing excess workforce supply by encouraging practitioners to exit the workforce earlier than they may have been intending.

Adjust net migration

Net migration refers to the number of overseas trained doctors coming in to practise in Australia, after subtracting the number of Australian trained doctors leaving the country to practise overseas. Depending on the particular workforce situation, the Commonwealth government could encourage (for workforce shortages) or discourage (for workforce surpluses) suitably qualified practitioners from overseas entering Australia.

Encourage adjustments in workforce productivity

Productivity refers to the rate at which the workforce provides services. Improving workforce productivity would involve increasing the volume of services being provided without increasing the number of practitioners and/or time involved in providing the services.

Changing workforce productivity is a supply side adjustment and could be achieved by implementing policies or programs which aim to refine service delivery. Examples of measures aimed at improving productivity would include: increasing practice support (assisting and/or simplifying procedures involved in running the non-clinical side of a practice); co-location of other clinical services (for referral of specific problems to those more able to deal with them); and implementing technological advancements which decrease the time involved in providing a particular service.

Improve workforce distribution

Strategies to improve workforce distribution do not necessarily focus on changing total workforce supply, but are aimed at re-distributing the total supply to ensure an appropriate distribution of practitioners so as to improve the service provision in areas of particular, or greatest, need.

While a workforce modelling exercise on a national level may show that total workforce supply is adequate, it may at the same time highlight inadequate supply in certain geographic regions. For example, rural areas may be undersupplied. If this is the case, recruitment and retention strategies aimed at encouraging practice in locations of shortage or discouraging practice in areas of workforce surplus will be necessary.

Redesign workforce tasks to vary the combination of skill mix and professions

Redesigning workforce tasks would involve some degree of substitution between health care service providers. For example, implementing programs whereby nursing or other staff members are trained and licensed to provide certain services currently only provided by medical practitioners or considering new types of health care workers altogether.

Influence consumer behaviour

Influencing consumer behaviour impacts on the requirement side of the workforce equation by either increasing or decreasing the level of services required.

9. MEDICAL WORKFORCE DATA COLLECTIONS

The initial key to good workforce planning is access to robust and reliable data sources. The truism – that planning is only as good as the available data – is a very real consideration in deciding to embark on a workforce planning exercise.

When reviewing an individual medical workforce, AMWAC's strategy is to access data from established national data-bases, such as those held by the Australian Institute of Health and Welfare (AIHW) (labour force and medical service utilisation), the Commonwealth Department of Health and Ageing (Medicare provider and utilisation data), medical Colleges (membership and trainee data) and the Australian Bureau of Statistics (ABS). Additional data collection activities are only undertaken by AMWAC once any essential information gaps have been identified.

Data collections of the AIHW include the national medical labour force survey, the Australian hospital statistics collection, the general practice activity survey and national aged care, mortality, cardiovascular disease and cancer databases. The AIHW also holds higher education student data obtained from the Commonwealth Department of Education, Science and Training, and immigration data from the Commonwealth Department of Immigration, Multicultural Affairs and Indigenous Affairs. The Commonwealth Department of Health and Ageing maintains a database on Medicare providers and services rendered. ABS data include medical workforce and qualification statistics from the five yearly census of the Australian population, population trends and projections; and a 1994-95 private medical practices industry survey. Medical colleges also hold a variety of workforce data, principally on number, age, gender and location of members, and data on vocational training placements and trainees. The Medical Training Review Panel (MTRP), a national advisory body to the Commonwealth Health Minister, publishes national data on vocational medical training (MTRP 2002). This data is collated for the MTRP by AMWAC. The Australasian Medical Publishing Company maintains a database of all practising doctors in Australia in order to publish the Medical Directory of Australia.

The following table juxtaposes AMWAC's workforce planning functions, when undertaking a review of a particular medical workforce, with the usual sources of data used to facilitate the process.

Table 8: AMWAC medical workforce planning function, by usual data source

Workforce planning function	Usual data source
<ul style="list-style-type: none">▪ Describe the current workforce	<ul style="list-style-type: none">- AIHW annual labour force survey- Medicare- Medical College- Commonwealth Health GP Branch- ABS census
<ul style="list-style-type: none">▪ Describe the current training program	<ul style="list-style-type: none">- Medical College
<ul style="list-style-type: none">▪ Estimate workforce inputs and outputs from retirements, death, migration, immigration and the training program	<ul style="list-style-type: none">- AIHW annual labour force survey- Medicare- Commonwealth Health GP Branch- DEST and DIMIA- Medical college- AMWAC/profession survey
<ul style="list-style-type: none">▪ Assess the adequacy of the supply and distribution of the current workforce drawing on any international and national benchmarks, the views of the profession and other key stakeholders	<ul style="list-style-type: none">- AIHW annual labour force survey- Medicare utilisation- AIHW hospital utilisation- AMWAC/profession survey- AMWAC survey of key stakeholders (GPs, health authorities, consumers)
<ul style="list-style-type: none">▪ Project workforce supply requirements for the next ten years using a range of needs based and demand based indicators	<ul style="list-style-type: none">- AIHW population morbidity data- ABS population estimates- Medicare utilisation trends- AIHW hospital utilisation trends
<ul style="list-style-type: none">▪ Assess the likely impact of new technologies on doctor productivity and future demand for services	<ul style="list-style-type: none">- AMWAC/profession survey- State/Territory health authorities- Expert opinion
<ul style="list-style-type: none">▪ Assess the likelihood of the community deciding to use other providers for some services currently provided by the respective medical workforce	<ul style="list-style-type: none">- State/Territory health authorities- AMWAC/profession survey- Expert opinion
<ul style="list-style-type: none">▪ Balance workforce requirements and supply	<ul style="list-style-type: none">- Relevant inputs from all of above
<ul style="list-style-type: none">▪ Monitor and report to AHMAC whether supply and requirements are changing as expected, and also that recommendations are being implemented as agreed	<ul style="list-style-type: none">- AIHW labour force survey- Medicare- AIHW hospital utilisation- Medical College- State/Territory health authorities

Australian Institute Of Health And Welfare Data Collections

1. Annual National Medical Labour Force Survey

The first national medical labour force survey of all doctors renewing registration with State and Territory Medical Registration Boards was undertaken in 1993 and has been repeated annually. Western Australia did not participate in 1994 and 1995, and the Australian Capital Territory did not participate in 1996.

The variables for inclusion in the survey were developed from a draft 'national minimum data set for health labour forces' created by the National Committee for Health and Vital Statistics in the 1980s. During this period, some State health authorities commenced collecting medical, nursing, dentistry and pharmacy workforce data in cooperation with State registration boards. In 1990 AHMAC directed the AIHW to commence national collections of data for major registrable health professions. In 1993 this project was included in the National Health Information Agreement (currently in place until the year 2003), and resources of State and Territory health authorities were committed to an annual collection of all registered doctors, a biennial collection for nurses and a three-yearly collection for several other health professions.

The AIHW reviews the content of the medical labour force questionnaire, in consultation with stakeholders, including AMWAC, Commonwealth and State health authority Chief Medical Officers and workforce planning units, the Australian Medical Association and Rural Doctors Association of Australia, on a biennial basis. The MTRP considers and recommends changes to the questionnaire which may lead to improved data collection on vocational training. However scope for additional questions is limited in order to maximise doctor-response and to limit Medical Board costs of posting re-registration material. This is consistent with the focus of the survey of maintaining a minimum national data set of key baseline medical workforce information to meet national policy and planning needs.

Information collected by the AIHW medical labour force survey includes: respondent age, sex, qualifications, discipline of practice, hours worked, work status and employment setting. Definitions for most variables are included in the National Health Data Dictionary published by AIHW in the National Health Information Knowledge-base (NHIK) and available on the AIHW website <http://www.aihw.gov.au> The most recent AIHW medical labour force publication is also available on this website.

The survey generally achieves a national response rate of around 80%, although there is a much greater variation in response among the States and Territories. In addition to the data collected by survey, State and Territory medical registration boards provide the AIHW with basic initial registration demographic data for registered doctors who have not responded to the survey. This informs development of weighting variables to better estimate the total medical workforce.

In 2000, in consultation with stakeholders, there was a major revision of the medical labour force survey questionnaire to address data gaps and question deficiencies

identified mainly through the detailed AMWAC working party analyses of workforce requirements for general practice and the medical specialties. The data that will become available from 2001 from this revision of the questionnaire will greatly enhance the level of analysis possible by AMWAC and workforce planners in government and the medical profession in the key areas of the rural and hospital workforces.

Strengths and limitations

The main strengths of the AIHW annual medical labour force survey include:

- provision of a comprehensive annual profile of the Australian medical workforce;
- cooperation of Medical Registration Boards which maximises response and minimises costs;
- data is collected for all registered doctors at annual renewal of registration each September, including those overseas and those not in the labour force; and
- the AIHW's Act enshrines confidentiality and privacy regulations ensuring complete confidentiality of individual data.

The main limitations of the survey are:

- interns, most short-term temporary resident doctors and some doctors identified by some Medical Registration Boards as not practising do not receive a notice of renewal of registration, and, hence, are not usually included in the data collection;
- variation in survey response rates by State and Territory, and by region within States; while good workforce estimates can be produced for States, local area estimates are untenable;
- variation in survey response rates by age of practitioner, where practitioners under 35 years of age and over 60 years of age tend to be poorer respondents than practitioners in other age groups;
- several thousand practitioners are registered with more than one medical board, and whilst it is considered that these are unlikely to complete and return more than one questionnaire, this does affect interpretation of response, especially for the Australian Capital Territory and the Northern Territory, both of which have high proportions of practitioners with registration in other jurisdictions; and
- timeliness of the information, where currently the survey returns are processed by individual jurisdictions, which can result in delays with the central collation of the data by the AIHW.

2. Australian hospital statistics collection

Since 1985-86, through State health authorities, the AIHW has been collecting both establishment and morbidity data for all public hospitals in Australia.

The National Public Hospital Establishments Database holds a record for each public hospital in Australia and contains workforce data including FTE salaried medical officers and is available by hospital size and by geographic type.

The National Hospital Morbidity Database has been used as a key source of data on service trends. The Database is a compilation of summary records for all admitted patients in public and private hospitals in Australia from 1993-94 onwards. The data include demographic, length of stay, diagnoses of the patient and the procedures they underwent in hospital.

Limitations

Deficiencies of the data from the hospital establishments statistics include:

- failure to distinguish among the different categories of salaried medical officers (eg. interns, registered medical officers, career medical officers, specialists-in-training, and salaried specialists such as emergency medicine, geriatric medicine and rehabilitation medicine specialists);
- trend figures for salaried medical officers are difficult to interpret over time because the numbers of salaried specialists (especially emergency medicine) and specialists-in-training have increased relatively rapidly. The data would be much more useful if disaggregated but this cannot be achieved in the National Hospitals collection if not readily available at the level of the individual hospital; and
- head count data and a breakdown between temporary resident doctors and others are also needed for workforce monitoring.

Deficiencies of the national hospital morbidity data include:

- the data does not include any codes indicating which category of medical staff was responsible for care of each patient. For example, for a routine birth, it is not known whether a midwife, junior hospital doctor, career medical officer, specialist-in-training or specialist obstetrician undertook the delivery; and
- data prior to 1998-99 used ICD9-AM to classify morbidity and data from 2000 uses ICD10-AM groupings with both classifications used for the 1998-99 data. Consequently, time series data may not always map exactly.

3. General practice activity survey

The Bettering the Evaluation And Care of Health (BEACH) general practice activity survey is a collaboration between the University of Sydney and AIHW (Britt et al 1999). The survey began in April 1998 and approximately 100,000 patient encounter records are collected each year from 1,000 general practitioners. As well as detailed patient encounter characteristics, workforce data are available on participating general practitioners and general practices. A number of regular reports have been produced reporting on survey results and these are available on the AIHW website www.aihw.gov.au/publications/health.

Limitations

The data collection is only in respect of vocationally registered general practitioners who volunteer to participate. Other medical practitioners providing primary medical care services are not included. The sample size limits geographic disaggregation of the data. This affects the reliability of some estimates for smaller rural centres and remote areas.

4. Medical students at Australian universities

Each year, the AIHW purchases from the Commonwealth Department of Employment, Science and Training a de-personalised data set of all students commencing, undertaking and completing health courses at Australian Universities. Time series data back to 1989 are available.

The data for each student include: course and university, level of course, age, sex, postcode of home location, Aboriginality, country of birth, citizenship and Australian residency status, and full-time or part-time attendance.

Summary medical student statistics are published each year in the AIHW's medical labour force publication.

5. Migration of health professionals to and from Australia

Each year the Commonwealth Department of Immigration, Multicultural and Indigenous Affairs provides the AIHW with an aggregated data set of all health professionals permanently migrating to or from Australia, and migrating temporarily for the purpose of employment or education. Time series data back to 1990 are available.

The data for each migrating doctor are collected on passenger cards and include:

- age, sex, country of previous residence, purpose of migration, duration of stay (incoming doctors); and
- age, sex, country of intended residence, purpose of migration, duration of stay (outgoing doctors), where purpose includes permanent migration, employment and education.

Summary migration statistics are published each year in the AIHW's medical labour force publication.

6. Other AIHW data collections

AIHW has national collections of cancer, cardiovascular disease, mortality, mental health, aged care and disability that provide service utilisation and population trends in a number of fields of medical service provision. These can assist in projecting growth in patient demand.

Medicare Provider Database - Commonwealth Department of Health and Ageing

The Medicare Estimates and Statistics Section of the Commonwealth Department of Health and Ageing accesses Medicare administrative data from the Health Insurance Commission on a daily basis. The database records information on Medicare providers: age and sex, geographic location of the providers practice, country of initial qualification and type of service provided. This information includes data from 1984-85 onwards. (It should be noted that care is needed in interpretation of statistics over time because of changes in classification in the Medical Benefits Schedule and in provider type.)

Data are available on all medical practitioners who rendered at least one 'fee-for-service' service for which Medicare benefits were payable in the period in question. Doctors who are ineligible to provide Medicare services but who refer patients for private pathology, x-ray and other diagnostic services rendered by Medicare providers are also recorded but are not included in Medicare provider statistics. These doctors are salaried doctors who are mainly working in public hospitals. From 1997, the Health Insurance Commission has used a unique code to identify newly arrived temporary resident doctors for workforce monitoring purposes.

During the last few years, the Medicare Estimates and Statistics Section of the Commonwealth Department of Health and Ageing has also been working closely with the Health Insurance Commission to improve the quality of Medicare provider data. This has included coding missing data items, reducing the numbers of duplicate providers in the statistics, improving the algorithms for deriving main specialty of practice, and enhancing the coding for identification of providers such as temporary resident doctors.

Strengths and limitations

The strengths of the Medicare data include:

- for specialties in which all practising specialists are active Medicare providers, there is complete coverage of the workforce since 1984-85, their demographic characteristics and their Medicare patient care activity;
- a comparison with ABS five-yearly counts of employed medical practitioners shows that increases in the Medicare provider workforce over a five year period have been about the same as the increase in the numbers of doctors enumerated in the census. This indicates that in the past annual growth in the Medicare provider workforce has been a good indicator of annual growth in the workforce as a whole. Changes to access to Medicare provider numbers from 1996 mean that this may not be the case from 1997 onwards for non-specialist Medicare providers;
- in primary care, Medicare data measure the number and volume of activity of doctors who are not recognised general practitioners, as well as those who are recognised general practitioners;
- Medicare provider data can be easily linked from one financial year to the next to identify the characteristics of additions and withdrawals from the Medicare workforce by discipline and by geographic region. Hence duration of stay and turnover rates of practitioners can be measured
- providers of outreach services to rural areas and interstate populations can also be identified through postcodes of secondary locations of practice;
- patient data from Medicare for specialist fields of practice can quantify the extent to which patients have been receiving the services from recognised specialists and/or from other doctors, and whether this varies among states/territories and among rural and metropolitan regions;
- reliable Medicare provider data become available just several weeks after the end of a reference period (such as a financial year). This level of timeliness provides a significant advantage over most other collections;

- doctors recognised in one discipline but mainly practising in another can be counted in the main specialty of practice. This gives much better data in some specialties of the true number of doctors mainly practising in those specialties; and
- there are strong legislative safeguards in respect of the confidentiality of individuals, and statistical data released publicly are either aggregated or numbers suppressed to preserve confidentiality.

The following limitations apply to the Medicare data:

- in disciplines where there is a high level of salaried employment, that activity is not private fee-for-service and therefore not included in Medicare data. In these disciplines, the Medicare provider data are of little assistance. For example, very few geriatric medicine specialists are active Medicare providers, because a large proportion work in aged care facilities;
- in primary care, Medicare data cannot distinguish among type of doctor for 'other medical practitioners'. Hence it is not known how many are in fact mainly non-primary care practitioners (such as hospital doctors), how many are primary care 'specialists' in fields such as sports medicine, and how many are general practitioners who do not have vocational registration;
- because Medicare data include doctors who render one or more Medicare services in a given period, many doctors are counted as Medicare providers who would be classed as inactive in other data collections. For example, there are more than 4,000 vocationally registered general practitioners and other medical practitioners who render fewer than 50 Medicare services in a three-month period. However, the limit can be set higher to exclude these providers
- hours worked are not collected, and therefore use of Medicare income is used as a proxy to distinguish between part-time and full-time practice;
- sex, year of birth and year and place of basic qualification are not known for a small percentage of doctors;
- some providers with more than one stem number may be counted more than once. This is a particular problem in oncology provider statistics;
- changes in levels of private health insurance coverage in Australia during the past decade make the interpretation of trend statistics of Medicare private 'fee-for-service' activity in hospitals much more difficult; and
- there is a small level of mis-classification of providers, a situation that is currently being addressed. In the past the Health Insurance Commission has given each new Medicare provider a recognised field of practice code (based on their qualifications), but not updated this code for changes over time.

Specialist Medical Colleges

The Australian medical colleges hold a variety of data, principally on the number and location of fellows, their age and sex, and data on vocational training placements and trainees. The colleges are able to provide AMWAC with the most comprehensive portrait of their respective training program, including an up-to-date profile of trainee numbers,

year of progression through the program, age and sex of trainee, number of graduates per year and trainee intake per year.

A number of specialist medical colleges undertake periodic workforce surveys of their members. In particular, the Royal Australasian College of Physicians has, for more than a decade, conducted a regular workforce survey.

As part of its work program of examining the workforce requirements of medical specialties, AMWAC has, where necessary worked with some of the medical colleges to develop tailor-made questionnaires to fill gaps in information. AMWAC has also developed a broadly standardised labour force collection instrument, which can be used on an on-going basis by the medical colleges.

In addition, AMWAC and the MTRP have worked with the medical colleges to produce an annual summary of Australian vocational training placements. The MTRP brings together key stakeholders in medical workforce training. MTRP annual reports have been published since 1997.

Australian Bureau of Statistics

1. National population census

The ABS conducts a national population census every five years. Information collected by the census includes: age and sex, geographical location, income, work status, and marital status etc. Employed doctors are classified using the six digit codes of the Australian Standard Classification of Occupations.

Table 8: Classification system used by the Australian Bureau of Statistics for collecting data about medical practitioners

Australian Standard Classification of Occupations code	Medical practitioner classification
129213	Medical administrator
231111	General medical practitioner (GP/GP-in-training/other medical officer/career medical officer/hospital medical officer)
231181	Medical practitioner-in-training (intern/registered medical officer)
231211	Anaesthetist
231215	Dermatologist
231215	Emergency medicine specialist
231217	Obstetrician and gynaecologist
231219	Ophthalmologist
231221	Paediatrician
231223	Pathologist
231225	Specialist physician
231227	Psychiatrist
231229	Radiologist
231231	Surgeon
231279	Specialist medical practitioner not elsewhere classified
231	Medical practitioner not further defined
2312	Specialist medical practitioner not further defined

The census also collects data according to highest qualification. With respect to medical practitioners, there are ten relevant fields and these are listed in the following table.

Table 9: Medical disciplines for which the Australian Bureau of Statistics census collects data on highest qualification

- General medicine
- Anaesthesiology
- Internal Medicine
- Obstetrics and Gynaecology
- Pathology
- Psychiatry
- Radiology
- Surgery
- Medicine, nec
- Medicine, nfd

Strengths and limitations

Strengths of the census data for workforce planning purposes include:

- Measurement of long-term (20 to 30 year) trends in Australian medical workforce numbers and characteristics. This data does not contain detailed information, however (see 2nd point below); and
- Availability of the following data which are not included in any other collection:
 - for Australian-born doctors and, for overseas-born doctors, labour force participation by age and sex of persons with a highest qualification in medicine, by whether qualification was obtained before or after arriving in Australia;
 - marital status and age of children for all doctors. This data enables comparisons to be made with other professional workforces;
 - country of birth and language spoken at home data for all doctors; and
 - small-area data on composition of the health workforce.

Limitations applying to the census data include:

- active medical practitioners who are mainly working in non-clinical fields of medicine are classified in the census as administrators, managers, educators, researchers, and so on, are excluded from the published figures for the medical workforce. In the AIHW labour force survey, these doctors are included in the medical workforce;
- not all workforce categories are sufficiently disaggregated for use in detailed workforce planning. For example, until the 1996 census, all non-specialist doctors were in one code; and at the 1996 census, general practitioners, other medical practitioners, career medical officers and hospital medical officers are in the one code. Sports medicine doctors and other self-reported primary care specialists may be coded as specialists not elsewhere classified, rather than as generalists. Interns and registered medical officers were given a separate code for the first time in the 1996 census;
- there is an unknown level of non-response to the occupation question for which no adjustment has been made in the published numbers, although it is known to result in an undercount. For the medical workforce, the undercount is thought to be comparatively small. AIHW has calculated that this is around 3-4 % for nurses, based on other ABS data, and that medical practitioner clinicians are under-reported by about the same amount; and
- the population census is only undertaken every five years, and the data for one census are considered out-of-date well before the next census.

2. Survey of private medical practices

Two reports were published by the ABS following the survey of private medical practices. The first report (Cat. 8685.0 *Private Medical Practice Industry, Australia*), contained information on income, expenses, employment, and capital expenditure etc. for private general practice and private specialist practice industries in Australia. The second report (Cat. 8689.0 *Private Medical Practitioners, Australia*), included data on age, sex, qualifications, hours worked and number of patient contacts per week.

Limitations

ABS excluded from the scope of the survey doctors with low levels of activity. Consequently the workforce data are not directly comparable with data from other collections. In large medical centres, the doctors were counted as a single practice if one legal entity, but as separate practices if multiple legal entities, despite service provision and sharing of overhead costs being similar for both.

3. Monthly labour force survey, with quarterly occupation data

The ABS reports labour force data for all occupations every three months. However, the sample size means that there is a high standard error for estimates of the numbers of practising doctors. Hence there is a great deal of volatility in the quarterly figures; this volatility means that the data are not particularly useful for workforce planning purposes. The quarterly occupation data do, however, provide comparative data for managers and professionals on workforce characteristics such as average hours worked by men and women.

Australian Medical Council And State And Territory Medical Registration Boards

The Australian Medical Council (AMC) has a national database of all medical practitioner registrations. All doctors must be registered with each State and Territory Medical Board in each State and Territory of intending practise, as a legal pre-requisite to practice. At the time of registration information is collected on home location, practice location, age and sex and qualification details, including year and place.

Strengths and limitations

Strengths of the AMCs national database of medical practitioner registrations are the inclusion of all doctors and the ability to extract particular categories of doctors, such as those qualified in a particular year or country.

Limitations of these data collections include:

- labour force status is unknown;
- Medical Registration Boards are sensitive about confidentiality and approval is needed from all eight Boards for tabulations of workforce interest; and
- address details can be incorrect due to the high relocation rate of younger doctors.

In addition to collecting data from responding doctors, most State Medical Registration Boards are able to provide basic initial registration demographic data for doctors who have not responded to the AIHW labour force survey. This assists in age-sex weighting survey responses to better estimate the total medical workforce as reported in the labour force survey.

Australasian Medical Publishing Company

The Australasian Medical Publishing Company (AMPCo) maintains a national database for all doctors in Australia through which it publishes the Medical Directory of Australia (MDA) (AMPCo 1999). The registration details of all newly registered doctors are obtained

from State and Territory Medical Registration Boards and added to the database. Additionally, the database is updated periodically through the use of workforce surveys on labour force status and practice activity. A full survey is always conducted before each new edition of the MDA is published. The database is used commercially as a mailing list for several medical publications; hence AMPCo receives continuous feedback on change of address, and uses this to maintain an up to date mailing list.

The MDA alphabetically publishes the name, qualifications, year and place of qualification, medical employment history, current practice addresses and telephone numbers of nearly all doctors practising in Australia (excluded are doctors who have not approved publication of this information).

Strengths and limitations

Strengths of the AMPCo database include:

- data on labour force status and practice location appear to be relatively up to date for specialists and general practitioners as a result of publication mail feedback;
- labour force information collected by discipline of practice is quite detailed;
- unlike the AIHW, Medicare and AMC databases, names and addresses of individuals can be rented to researchers and marketing companies wishing to survey, or provide information to, sub-groups of doctors. Hence the AMPCo database provides a readily available population frame for researchers wanting to collect more detailed information from doctors;
- AMPCo trend data are available in hard copy for the last decade; and
- if a doctor dies or retires, he or she is still retained in the database as dead or retired respectively.

Limitations applying to the AMPCo database include:

- in recent years, surveys to update data for individual practitioners have only been conducted every two years or so, and the response rate is commercial-in-confidence;
- data for junior hospital doctors may be less reliable than for other doctors because of their mobility. This is consistent with the difficulty in enumerating these doctors in other surveys; and
- AMPCo data are copyrighted, but in the past AMPCo has requested that we acknowledge AMPCo in our publications where their data is included, and has not sought royalties. There has been a change in policy to increase AMPCo's profile for research and statistical analysis.

Conclusions

During the past decade there has been considerable improvement in the collection and provision of data about the medical workforce by medical colleges, medical institutions and government bodies. However, limitations apply to most national data collections according to the purpose of the collection and care is therefore needed in interpretation of numbers across data collections. The data collections of the AIHW, particularly data

arising from the annual medical labour force survey, have been a key factor in enabling national level medical workforce planning in Australia.

APPENDIX A: THE AUSTRALIAN HEALTH SYSTEM – A SHORT SUMMARY

Every two years the Australian Institute of Health and Welfare reports on Australia's health, providing national information on health needs and services and the development and evaluation of health policies and programs. The following summary of the organisation of the Australian health system is taken from *Australia's Health 2002* (AIHW 2002). A full copy of the report can be obtained from the AIHW website at www.aihw.gov.au

The Australian health system is complex, with many types and providers of services and a range of funding and regulatory mechanisms. Those who provide services include medical practitioners, other health professionals, hospitals and other government and non-government agencies. Funding is provided by the Commonwealth Government, State and Territory Governments, health insurers, individual Australians and a range of other sources.

The Commonwealth Government's funding includes two national subsidy schemes, Medicare and the Pharmaceutical Benefits Scheme. These schemes cover all Australians and subsidise their payments for medical services and for a high proportion of prescription medications bought from pharmacies. The Commonwealth and State/Territory governments also jointly fund public hospital services so they are free of charge to patients. Between them, these funding provisions aim to give all Australians, regardless of their personal circumstances, access to adequate health care at an affordable cost or no cost.

Many patients' first contact with the health system is through a general medical practitioner. Patients can choose their own general practitioner and are reimbursed for all or part of the general practitioner's fee by Medicare, depending on the general practitioner's billing arrangements. For specialised medical care patients can be referred by a general practitioner to specialist medical practitioners, other health professionals, hospitals and community-based healthcare organisations. Australians also visit dentists and other private sector health professionals of their choice. Charges are met by the patients themselves, or with support of private health insurance, which Australians may purchase for these or hospital services.

Patients can access public hospitals through emergency departments, where they may present on their own initiative, or via the ambulance services, or after referral from a medical practitioner. Admitted patients are charged nothing for their treatment, food and accommodation, unless they choose private treatment. Emergency department and outpatient services are free.

Australians may choose to be private patients in hospital, if they use a private hospital, or choose to be treated as a private patient in a public hospital. Private patients can choose their own doctor. The hospital's services must be paid for by the patient or, for members,

with the support of their private health insurance fund. Medicare subsidises the fees charged by doctors for services provided to private patients in hospitals, and private health insurance funds also contribute towards medical fees for insured patients.

The health service system is regulated in various ways. Private hospitals are licensed by State/Territory Governments. Medical practitioners and other health professionals are registered for practise in each State/Territory.

In addition to the services outlined above, the Commonwealth, State and Territory Governments and local governments provide public health services, community health services and ambulance services.

APPENDIX B: MEDICAL WORKFORCE PLANNING IN AUSTRALIA – SOME HISTORY, OUTCOMES AND CURRENT ORGANISATIONAL STRUCTURES

In 1788, the First Fleet arrived in Australia with four doctors to serve a European population of around 1,000. Today in Australia there are around 50,000 doctors serving a population of over 18 million. The reasoning behind the inclusion of four doctors with the First Fleet has probably been lost to history, but it can be seen to represent not just the beginning of European medical practice in Australia, but also possibly one of the earliest attempts at medical workforce planning. Nationally, until the 1980s there has been comparatively little emphasis placed on medical workforce planning, apart from that undertaken by some medical organisations, individuals (Last 1964, Scotton 1967) and occasionally governments.

There are probably several reasons for this. For much of the early post Second World War period the economy was generally growing, the population increasing, and demand for doctors and all types of health care services were increasing. Until the 1970s, there was a commonly held view that increasing the number of doctors could solve most workforce problems (for example, maldistribution, shortages in certain disciplines). In this context, workforce analysis usually focused on population growth, doctor-to-population ratios and adjustments (that is increases) to medical school intakes. Just as significant however, there were no reliable data or projection modelling techniques available to inform the policy process. Only in recent years has the information technology revolution facilitated the collection and processing of large, complex data sets.

Across all periods however the common supply policy has been national self sufficiency. However, maldistribution of the workforce, particularly between urban and rural areas, has been a constant challenge to policy makers, and over the past ten years the policy response has been to supplement the Australian trained workforce with the employment of temporary resident overseas trained doctors. These doctors have been employed in particular areas of need – mostly in rural general practice and in the public hospital system, both urban and rural.

Whilst national self sufficiency may have been the common policy theme, the policy focus has changed over the years. For example in the post Second World War period workforce supply policy has ranged from:

- steady growth (1945 to mid 1970s)
- increasing supply (mid 1970s into 1980s)
- managing surplus (mid 1980s to mid 1990s)
- improving distribution (mid 1990s onwards)
- encouraging supply growth (late 1990s onwards).

Medical Workforce Planning 1960-1995

Prior to 1988, formal government supported workforce planning initiatives in Australia can be traced to several ad hoc reports, including the Report of the Committee on Medical Schools to the Australian Universities Commission (Karmel 1973). The Committee

recommended an increase in medical school intakes, including the establishment of two new medical schools (viz Newcastle and Townsville), to provide 1,560 graduates per year by 1991 (Karmel 1973). The Report of the Committee of Officials titled 'Medical Manpower Supply' (Sax 1980) revised estimates of population growth downwards. The Committee of Officials noted that net medical migration was occurring at levels substantially above that projected in the Karmel report, and consequently revised workforce requirement projections downwards (Sax 1980). At the same time, the Jamison inquiry into the efficiency of Australian hospitals noted that the Commission 'was told on many occasions that there was an oversupply of doctors' but 'in attempting to assess this argument, the Commission was confronted with poor data' (Jamison 1981).

In 1988, what was widely regarded as a landmark report on workforce education and training was produced by the Committee of Inquiry into Medical Education and Medical Workforce, chaired by Professor Ralph Doherty. The Doherty review covered a wide range of issues including encouragement of more co-ordinated focus on medical workforce planning and data. The review also noted 'the view, widespread in the medical profession, of an oversupply of general practitioners in urban areas so that the prospect of establishing a practice in the city may not be seen as a viable option for some medical graduates'. The Doherty report concluded that the medical workforce should be monitored more closely than in the past and recommended the establishment of an ongoing 'Medical Workforce Review Committee' with representation from bodies similar to those represented in the Australian Health Ministers' Advisory Council. Importantly, the Committee drew attention to deficiencies in the quality of medical workforce data and recommended the standardisation of classifications and the establishment of a national database, one that was built around a survey of all doctors at the time of re-registration with their primary medical board (Committee of Inquiry into Medical Education and Medical Workforce 1988).

Following publication of the Doherty report, the Medical Workforce Data Review Committee (MWDRC) was established in 1991. Further impetus for the formation of the MWDRC came from growing government concern about the acceleration of Medicare outlays, which were generally considered to be associated with growth in doctor numbers and Medicare's system of doctor-reimbursement. Compared with payment systems in other countries, Australia's system is described as being uniquely open-ended, with patients having free access to unlimited Medicare benefits and doctors to Medicare fee-for-service payments. At the same time there was recognition that the growth in doctor numbers had failed to address the serious problem of workforce maldistribution. For example, the Doherty report noted that 'there is... no mechanism for the control of the geographical distribution of doctors or the number of doctors who can be reimbursed by the Health Insurance Commission' (Committee of Inquiry into Medical Education and Medical Workforce 1988, p. 449). As its name implied, the principal term of reference of the MWDRC was to review data – particularly data related to medical workforce supply. Underpinning this emphasis was the notion that control of medical supply would assist to curtail growth in Medicare outlays (MWDRC 1994, Douglas 1995).

In parallel with the work of the MWDRC, the Australian Institute of Health and Welfare (AIHW) began to develop the questionnaire for survey of doctors at time of re-registration. This survey is now an annual occurrence (AIHW 2002).

However, by 1994 there was acceptance by all levels of government that a broader approach to medical workforce planning was required to ensure that future populations have access to appropriate medical services. Concern over the availability of some specialist services in particular, and the overall level and distribution of workforce supply had become the subject of widespread debate. These issues were highlighted in two reports considered by government and other organisations with an interest in medical workforce matters (Patterson 1994, Baume 1994). At the October 1994 meeting of the Australian Health Ministers' Advisory Council (AHMAC) the decision was taken to form a new national workforce planning body, with wide ranging terms of reference. The organisation that was formed as a result of that decision was the Australian Medical Workforce Advisory Committee (AMWAC).

Australian Medical Workforce Advisory Committee

AMWAC was formed as a national advisory committee in 1995 to assist with the development of a more strategic focus to national medical workforce planning. The formation of AMWAC reflected recognition of the need for:

- a national focus on longer term planning;
- a skilled committee of key stakeholders (government, profession, service providers, consumers and educators) working in partnership; and
- analysis using robust data and a consistent planning approach, with a continuity in recommended action.

AMWAC reports to AHMAC, and through AHMAC to the Australian Health Ministers' Conference. The terms of reference AMWAC operates under are:

1. To provide advice to the Australian Health Ministers' Advisory Council on a range of medical workforce matters, including:
 - the structure, balance and geographic distribution of the medical workforce in Australia;
 - medical workforce supply and demand; and
 - the number and distribution of education and training places needed to meet future demand as suggested by patterns of supply, population health status, practice developments and changing models of health care.
2. To develop models for describing and predicting future medical workforce requirements, and provide advice on its methodology, including indicators and benchmarks, for use by employing and workforce controlling bodies including governments, specialist medical colleges and tertiary institutions at:
 - national level;
 - state and territory levels; and
 - intra-state and territory.
3. To oversee the establishment and development of data collections concerned with the medical workforce, and analyse and report on those data to assist workforce planning.

4. To work in co-ordination and co-operation with the Australian Health Workforce Officials' Committee (AHWOC) in the assessment of the relationship between medical workforce requirements and new or alternative workforce structures, profiles and broader health human resources planning requirements.
5. To provide AHMAC with advice as requested on:
 - best practice models of care;
 - future service delivery and workforce developments; and
 - dynamic scenario planning for the medical workforce.
6. To take into account in its planning, and provide advice in its reports, on information on evidence based practice and outcomes.
7. To advise AHMAC on strengths and weaknesses of possible approaches to achieving desirable workforce supply in accordance with quality health care practices.

AMWAC oversees a medical workforce research program which is approved by AHMAC. This specific medical program is complementary to, and linked with, the broader health workforce research agenda overseen for AHMAC by AHWOC.

The AMWAC work program is divided between examination of broad and evolving workforce issues such as increased female participation in the workforce, sustainable specialist service requirements, and the examination of the career choice decisions of doctors in vocational training; and a series of studies which examine each of the specialist workforces in detail - describing supply and requirements, assessing the adequacy of supply, projecting supply and requirements and providing recommendations on future supply.

Each research project is usually overseen by a working party, comprising relevant stakeholders drawn from Commonwealth/State/Territory health departments, the relevant professional organisations, consumers and co-opted experts. Since 1995, AMWAC has completed over 40 research projects on aspects of the Australian medical workforce and a full list of publications is attached at the end of this paper.

The Australian Health Workforce Officials Committee (AHWOC) provides a forum for reaching agreement on key national level health workforce issues requiring government collaborative action and provides advice on health workforce issues to AHMAC. AHWOC also has a central role to play in co-ordinating the implementation of the recommendations arising from the workforce planning analysis undertaken by AHWAC and AMWAC. The Committee comprises a nominee from the Commonwealth/State/Territory health departments and the Commonwealth Department of Education, Science and Training. The AHWOC terms of reference are:

1. To advise the Australian Health Ministers' Advisory Council (AHMAC) on priority workforce issues requiring national collaboration.

2. To provide advice to AHMAC on policy, funding and health care delivery options and implications for health workforce development.
3. To provide a forum for ongoing communication and consultation between States, Territories and the Commonwealth in relation to workforce priorities, the development of appropriate and supported industrial frameworks and workforce developments within jurisdictions.
4. To advise AHMAC on implementation issues arising from Australian Medical Workforce Advisory Committee (AMWAC) and Australian Health Workforce Advisory Committee (AHWAC) recommendations.
5. Work with AMWAC and AHWAC, and convene specialist groups where necessary, to provide advice on:
 - structure, balance, geographic distribution and future demand and supply requirements for priority skilled health workforces in Australia;
 - development and refinement of models for describing and predicting future skilled health workforce requirements in line with emerging technologies, treatment patterns and models of clinical care;
 - current and future educational and training requirements of priority skilled health workforces; and
 - establishment and development of data collections, analyses and workforce performance indicators to assist workforce planning.
6. To liaise with peak groups and organisations as required.

Workforce planning for the nursing, midwifery and allied health workforces is overseen by the Australian Health Workforce Advisory Committee. Implementation of the Aboriginal and Torres Strait Islander Workforce National Strategic Framework is being overseen by the Aboriginal and Torres Strait Islander Health Workforce Working Group, which reports to AHWOC.

An organisational chart outlining the government health workforce planning structure is shown below in figure 3.

Figure 3: Organisational chart – national health workforce committees, Australia, 2003



Medical Workforce Planning - Aims

In Australia the broad aim of medical workforce planning has been to estimate the number of medical practitioners required to meet (but not exceed) future population requirements. A complementary role is the identification of data needs and emerging policy issues. This work provides a quantitative base from which to develop national workforce policy and make necessary adjustments to workforce numbers, composition, distribution and workplace organisation. Therefore, the focus of the AMWAC research has been on the practical (as opposed to the theoretical) and linked directly to providing advice to government. On the medical side, most focus has been on supply adjustments and policy action has been targeted at medical workforce entry points, such as medical school and overseas doctor intakes; and at individual discipline entry, through adjustments to the intake to particular specialist vocational training programs. To date, AHMAC and AMWAC have preferred to target supply entry points rather than considering actions such as exploring options for work place reorganisation or workforce substitution.

As Duckett (2000) has observed, health workforce planning in Australia has typically attempted to influence supply because demand has been viewed as exogenous. Given this policy focus on supply management, government (Commonwealth/State/Territory) has considered that there is a role for health workforce planning. Government involvement in workforce planning also reflects the nature of the Australian health system and market place, where government is involved in the provision of public hospital services and the setting of prices through Medicare.

AMWAC is not the sole government body with an interest in the workforce area. In particular the Committee works closely with the AIHW on data issues and through it with the Health Insurance Commission. As noted above AMWAC links into the broader health workforce agenda through AHWOC. AMWAC also works closely with the Medical Training Review Panel, particularly in regard to vocational training issues. Other key workforce players with whom AMWAC works include Commonwealth/State/Territory health departments, university medical schools, the Australian Medical Council, the Australian Medical Association, the medical colleges, Divisions of General Practice, State/Territory Rural Workforce Agencies, and the Commonwealth Department of Immigration, Multicultural Affairs and Indigenous Affairs and the Commonwealth Department of Education, Science and Training.

The main brief of AMWAC has been to advise the Commonwealth and State/Territory governments on national level workforce planning issues. State/Territory and regional/local health authorities, whilst assisting this national planning exercise, have largely been responsible for more regional planning and implementation of the national decisions as they apply to their own jurisdictions. This division reflects the federal model of Australian government and the division of health responsibilities between the Commonwealth and the States/Territories. (This division of responsibility is summarised in Appendix A.)

Overall, AMWAC has maintained that while a strict balance between supply and demand may be difficult to achieve in medical workforce management, planning to minimise divergences between the two is the essential aim of reliable workforce planning.

AMWAC Research Program And Findings 1995-2003

Over the period April 1995 to June 2003, AMWAC has completed 24 individual medical workforce reviews. The aim of the reviews has been to describe the characteristics of the workforce, assess the adequacy of the workforce and project workforce supply and requirements. If necessary, adjustments to training program intake have been recommended so as to move expected supply into line with estimated future requirements.

To date, the individual workforce reviews have shown there are a diverse range of trends across disciplines. For example the process has highlighted disciplines that:

- have definite shortages (for example anaesthesia, radiology, thoracic medicine, oncology);
- are likely to experience shortages if not corrected (for example urology, ear nose and throat surgery and orthopaedic surgery);
- have a definite surplus (general paediatrics);
- are in a supply growth phase, because they are relatively new areas of specialisation, but are then expected to have to taper off (for example emergency medicine);
- are not experiencing much growth in demand for services but have a large cohort of older practitioners moving through to retirement who will need replacing (for example general surgery and ear nose and throat surgery);
- are not experiencing much growth in demand for services but have a comparatively large cohort of older male practitioners moving through to retirement and a significant number of female practitioners moving into the workforce (for example obstetrics and gynaecology);
- have current shortages of both practitioners and trainees and have problems attracting trainees to the discipline (for example oncology, geriatric medicine); and
- require changes in the approach to vocational training due to the changes that are occurring in the way services are being provided (for example dermatology).

Implementation Of AMWAC Recommendations

Implementation of the recommendations of the individual AMWAC workforce reviews remains good, with implementation on track for the majority of workforces reviewed. In total, as of September 2002, 239 new training positions had been created and there were 54 new first year advanced training placements. This means, in total, around 90% of the recommended training adjustments by 2002 are in place.

However there are five disciplines (ENT surgery, obstetrics and gynaecology, orthopaedic surgery, paediatrics and radiation oncology) that continue to make slow progress with implementation. This appears to be due to funding and training infrastructure difficulties. In the case of paediatrics, the AHMAC committee established to oversee implementation

has not met for several years and this may reflect on-going concern about the impact on children's hospitals of a reduced inflow of paediatric trainees.

The following two tables summarise implementation progress. A more detailed summary is provided in the AMWAC Annual Report for 2001-02.

Table 9: Summary of AMWAC medical workforce reviews, recommended increase in advanced training positions and number of training positions, by discipline, 2002

Specialty	Number of training positions at the time of the AMWAC review ^a	Recommended increase in training positions ^b	Recommended total number of training positions ^b	2002 positions (increase)
Anaesthesia ^c	478 (2001)	34 (2003)	512 (2003)	478 (0)
Dermatology	42 (1998)	10 (2002)	52 (2002)	55 (13)
ENT surgery	40 (1997)	20 (2000)	60 (2000)	48 (8)
General surgery	176 (1997)	40 (2000)	216 (2000)	246 (70)
Ophthalmology	79 (1996)	12 (2006)	91 (2006)	95 (16)
Radiology - radiodiagnosis	200 (2001)	60 (2004)	260 (2004)	205 (5)
Radiation oncology	52 (1998)	12 (2000)	64 (2000)	61 (9)
Urology	33 (1996)	9 (2006)	45 (2006)	45 (9)

a - the year in brackets after the number of training positions refers to the year the workforce review was completed (using training position numbers from the previous year)

b - the year in brackets after the number of training positions refers to the year by which the recommended increases should ideally be in place

c - anaesthesia is now based on the updated recommendations from the 2001 report, the increase in training positions since the initial review in 1996 is 109.

Source: AMWAC and medical colleges

Table 10: Summary of AMWAC medical workforce reviews, recommended first year advanced trainee intake and number of first year advanced trainees in 2002, by discipline

Specialty	Estimated first year trainee intake at the time of the AMWAC review ^a	Recommended first year trainee intake ^b	First year trainee intake 2002
Cardiology	24 (1999)	24-28 (2000-2003)	39
Cardiothoracic surgery	5 (2002)	5 (2002-2011)	6
Emergency medicine	120 (1997)	120 (1997-1999), 100 (2000), 70 (2001), 40 (2002), 25 (2003 on)	115
Gastroenterology	12 (2000)	22 (2001-2002), 23 (2003-2008)	16
General practice	450 (2000)	450 (2001-2003)	450
Geriatric medicine	16 (1997)	25 (1999-2000), 22 (2001-2002)	17
Haematological oncology	14 (2002)	17 to 20 (2002-2007)	14
Intensive care	16 (1999)	24 to 26 (2000-2008)	^c
Medical oncology	13 (2002)	15 to 18 (2002-2007)	12
Neurosurgery	9 (2000)	6 to 8 (2001 onwards)	6
Obstetrics and gynaecology	42 (1998)	55 (1999-2000)	53
Orthopaedic surgery	32 (1999)	38 (2000), 40 (2001), 44 (2002-2005)	36
Paediatrics ^d	58 (1998)	35 from 2001	54
Psychiatry	111 (1999)	124 (2001) 131 (2001 onwards)	127
Rehabilitation medicine	15 (1997)	Increase up to 25 (1998-2000)	27
Thoracic medicine	13 (1999)	16 (2001), increasing by 2 per year up to 24 (2005)	12

a - the year in brackets after the number of trainees refers to the year the workforce review was completed (using trainee numbers from the previous year)

b - the year in brackets after the number of trainees refers to the year by which the recommended changes in trainee placements should ideally be in place

c - the nature of the intensive care training program means that the great majority of trainees are in the third, fourth or fifth year of the training program, this is because often training years 1,2 and 3 are undertaken in a primary specialty such as anaesthesia, medicine or related disciplines; therefore it is not possible to accurately estimate the number of trainees in intensive care in their first year of training (which is only likely to be a small number of trainees); however over the period 1997 to 2002 the total number of intensive care trainees has increased by 112, from 108 to 220

d - the data for paediatrics refers to basic trainees registered in training year two, the first year of registration

Source: AMWAC, medical colleges and GPET

Since the mid 1990s the general themes of Australian workforce policy has been improving distribution coupled with a steady growth in key parts of the workforce in line with AMWAC recommendations. This growth in supply is occurring in particular in the specialist disciplines and is reflected in training program intakes and specialist workforce numbers. General practitioner numbers also continue to grow but not at as rapid a rate as specialist numbers.

However, the most noticeable trend in recent years in the Australian medical workforce has been the dramatic increase in the use of temporary resident overseas trained doctors. AMWAC has reported previously on these trends (AMWAC 1999.3). Temporary resident doctors fall into two main categories: area of need practitioners working in an identified area of shortage and occupational trainees working in a supervised training program.

As at 30 June 2002, there were an estimated 2656 TRDs working in the Australian health system. This represents a 98% increase in the five years since 1997-98. The TRDs are mostly occupational trainees or being employed in particular areas of need – most notably in rural general practice and the Australian public hospital system, where it has proved difficult to attract Australian trained doctors. Given that location of practice can be specified for TRDs, it is assumed that much of the increasing use can be explained by their more immediate impact on supply coupled with the possibility of some influence on the location of practice. What is equally clear is that what was initially conceived as a short term measure is now a permanent feature of the Australian medical workforce.

The trend in key workforce indicators for the period 1994 to 2002 is provided in the following figures.

Figure 4: Employed clinicians, Australia, 1993-1999

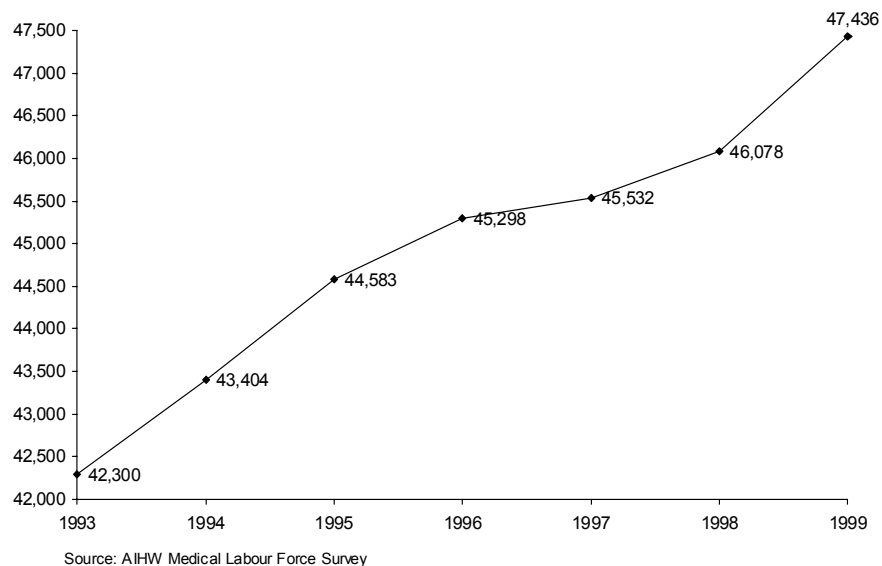
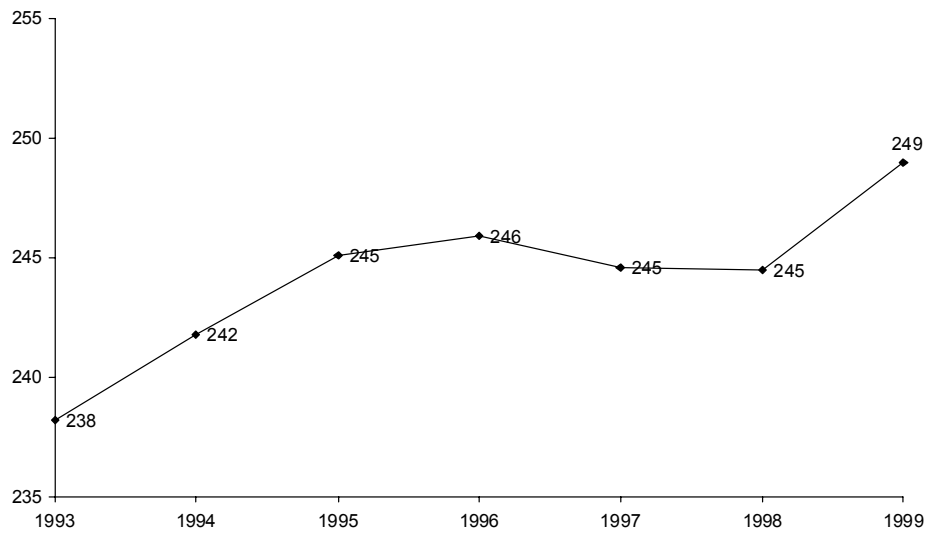
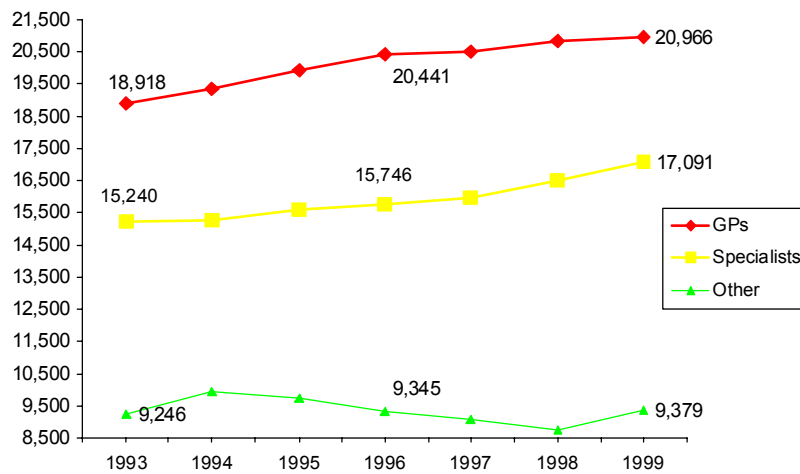


Figure 5: Employed clinicians per 100,000 population, Australia, 1993-1999



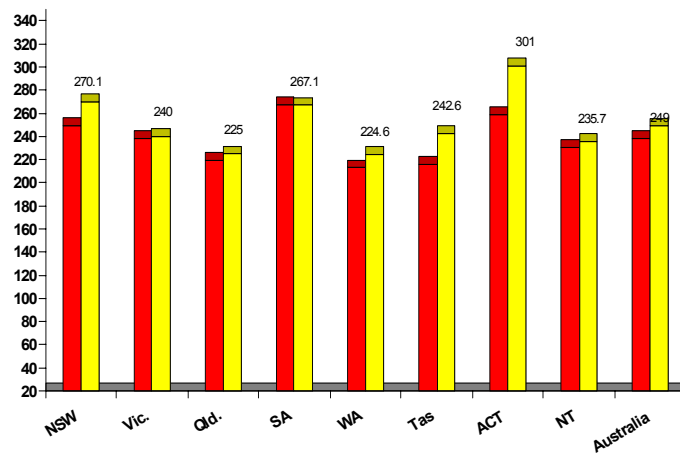
Source: AIHW Medical Labour Force Survey

Figure 6: Specialists and general practitioners, Australia, 1993-1999



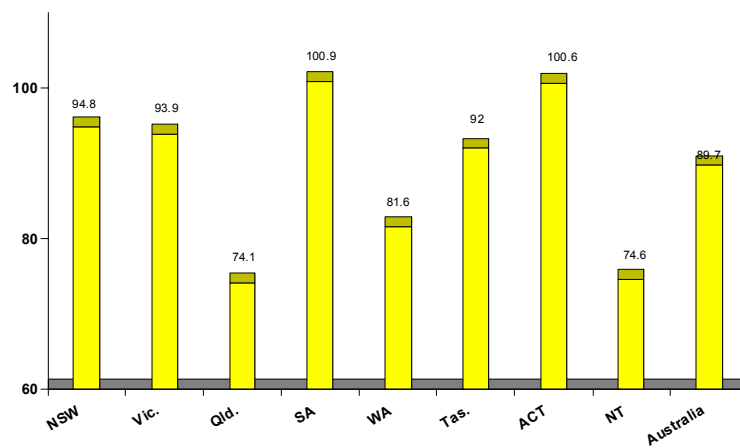
Source: AIHW Medical Labour Force Survey

Figure 7: Clinicians per 100,000 population, Australia, by State/Territory, 1993 and 1999



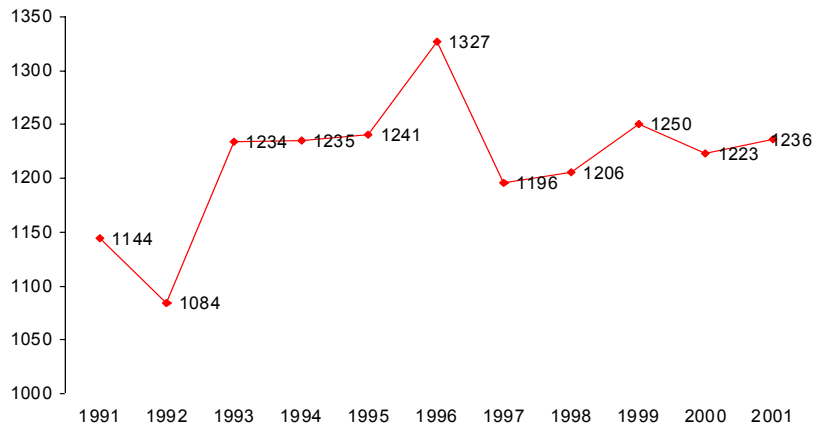
Source: AIHW Medical Labour Force Survey

Figure 8: Specialists per 100,000 population, Australia, by State/Territory, 1999



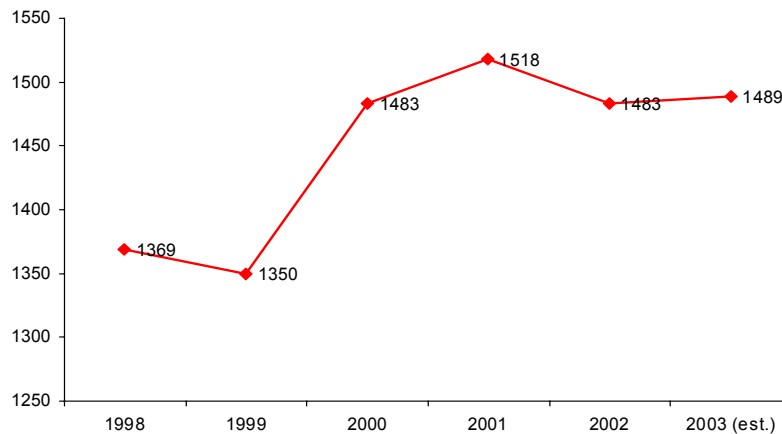
Source: AIHW Medical Labour Force Survey

Figure 9: University medical school completions, Australian citizens and permanent residents, 1991-2001



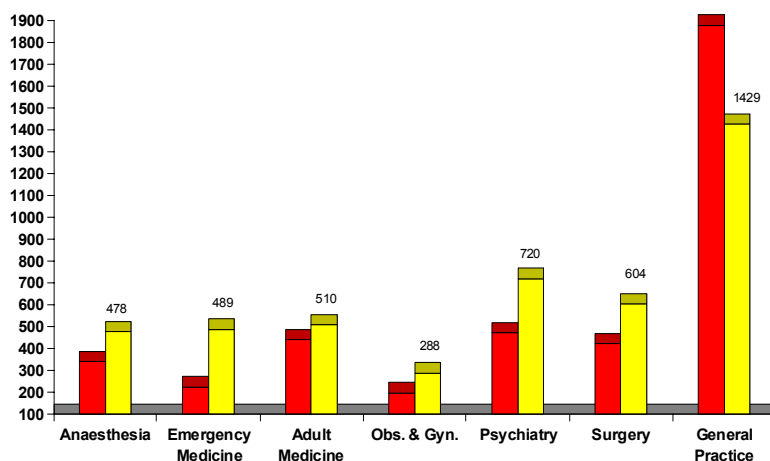
Source: AIHW, DEST, Australian Medical Schools

Figure 10: First year vocational training placements, Australia, 1998-2003



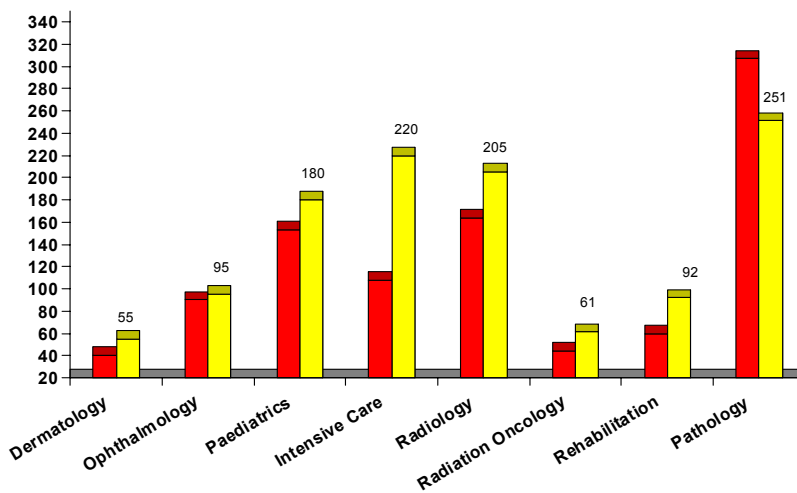
Source: AMWAC and Medical Colleges from MTRP Annual Reports

Figure 11: Vocational training placements, Australia, by specialist discipline, 1994 and 2002



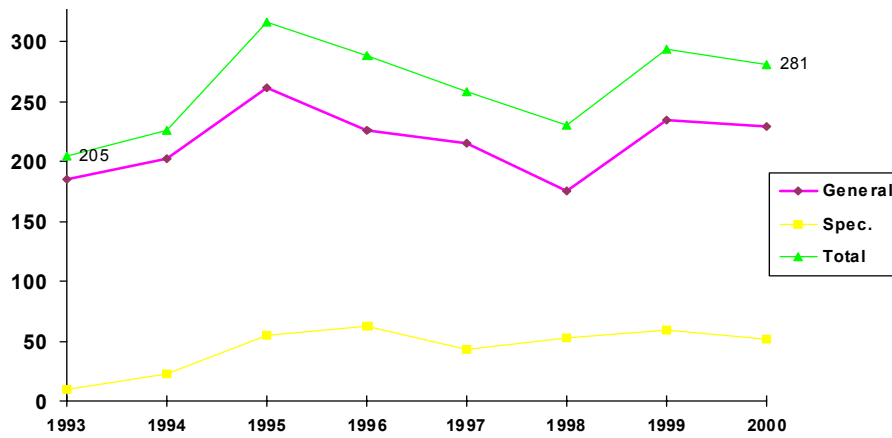
Source: 1994 (MWDRC), 2002 (AMWAC & MTRP)

Figure 12: Vocational training placements, Australia, by specialist discipline, 1994 and 2002 (continued)



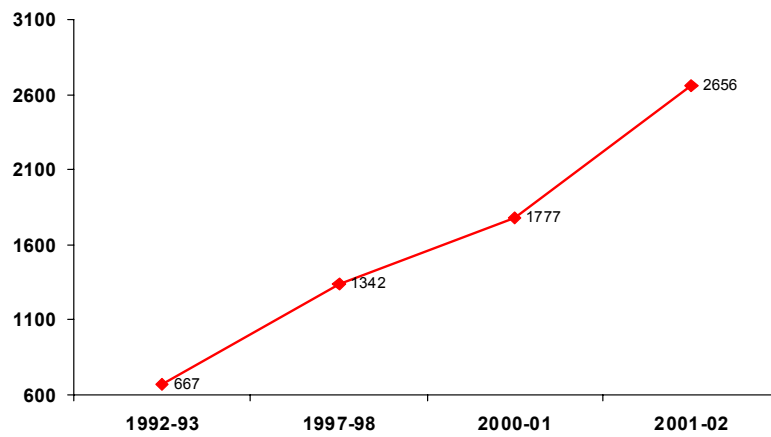
Source: 1994 (MWDRC), 2001 (AMWAC & MTRP)

Figure 13: Australian Medical Council passes, 1993-2000



Source: AMC

Figure 14: Temporary resident doctor arrivals in Australia, area of need and occupational trainee stock as at 30 June, 1992-2002



Source: AMWAC & DIMIA

APPENDIX C: AN EXAMPLE OF THE AMWAC SPECIALIST MEDICAL WORKFORCE CALCULATION TOOL

Projection Assumptions for a Medical Workforce

Starting Year for Projections 2003
 Total Workforce in Starting Year 1,463

Gender	Age Group	Sample Workforce	Ave. Hours Worked per Week	Workforce Dynamics		Sample Graduates
				Losses	Migration	
Female	20-24	0	0	0	0	0
Female	25-29	0	0	0	0	0
Female	30-34	40	47.6	0	0	5
Female	35-39	38	43.8	0	0	6
Female	40-44	56	43.8	0	1	1
Female	45-49	60	46.5	0	0	0
Female	50-54	20	46.5	0	0	0
Female	55-59	25	46.3	0	0	0
Female	60-64	7	46.3	1	0	0
Female	65-69	5	27.3	2	0	0
Female	70+	3	27.3	3	0	0
Males	20-24	0	0	0	0	0
Males	25-29	0	0	0	0	0
Males	30-34	100	51.8	0	0	14
Males	35-39	102	58.7	0	1	35
Males	40-44	220	58.7	0	2	2
Males	45-49	230	57.5	0	1	1
Males	50-54	185	57.5	0	0	0
Males	55-59	180	51.9	0	0	0
Males	60-64	93	51.9	7	0	0
Males	65-69	45	32.7	15	0	0
Males	70+	54	32.7	10	0	0
Total		1463	52.4	38	5	64

Graduating Students

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
45	48	50	52	54	60	62	62	62	62	62	62

Number

Base Year Total Workforce Losses	38.2
Base Year Total Migration	5

Proportion of Graduates to Workforce	1.0000
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Proportion

Vary Workforce Losses by	0.00
Vary Workforce Reentry by	0.00
Vary Workforce Migration by	0.00

Annual Compound Growth Rate

Demand Labels	Annual Growth Rate
Population growth and ageing	1.013
Current Shortage or Oversupply	-10
Standard Working Week in Hours	52.4

Note : enter negative for shortage

Key Assumptions - Baseline Projection

Age	Base Year		Adjusted Estimates		Adjusted Rates		Head count	Estimate	FTE	ave hours per week	Weighted Hours
	Waste	Migrate	Waste	Migrate	Waste	Migrate	Relative				
20-24	0	0	0	0	0.0000	0.0000	0	0	0.00	0.0	0.0
25-29	0	0	0	0	0.0000	0.0000	0	0	0.00	0.0	0.0
30-34	0	0	0	0	0.0000	0.0000	40	40	0.91	47.6	1,904.0
35-39	0	0	0	0	0.0000	0.0000	38	38	0.84	43.8	1,664.4
40-44	0	1	0	1	0.0000	0.0179	56	56	0.84	43.8	2,452.8
45-49	0	0	0	0	0.0000	0.0000	60	60	0.89	46.5	2,790.0
50-54	0	0	0	0	0.0000	0.0000	20	20	0.89	46.5	930.0
55-59	0	0	0	0	0.0000	0.0000	25	25	0.88	46.3	1,157.5
60-64	1	0	1	0	0.1754	0.0000	7	7	0.88	46.3	324.1
65-69	2	0	2	0	0.4000	0.0000	5	5	0.52	27.3	136.5
70+	3	0	3	0	1.0000	0.0000	3	3	0.52	27.3	81.9
20-24	0	0	0	0	0.0000	0.0000	0	0	0.00	0.0	0.0
25-29	0	0	0	0	0.0000	0.0000	0	0	0.00	0.0	0.0
30-34	0	0	0	0	0.0000	0.0000	100	100	0.99	51.8	5,180.0
35-39	0	1	0	1	0.0000	0.0098	102	102	1.12	58.7	5,987.4
40-44	0	2	0	2	0.0000	0.0091	220	220	1.12	58.7	12,914.0
45-49	0	1	0	1	0.0000	0.0043	230	230	1.10	57.5	13,225.0
50-54	0	0	0	0	0.0000	0.0000	185	185	1.10	57.5	10,637.5
55-59	0	0	0	0	0.0000	0.0000	180	180	0.99	51.9	9,342.0
60-64	7	0	7	0	0.0753	0.0000	93	93	0.99	51.9	4,826.7
65-69	15	0	15	0	0.3333	0.0000	45	45	0.62	32.7	1,471.5
70+	10	0	10	0	0.1852	0.0000	54	54	0.62	32.7	1,765.8
	38	5	38	5	0.0261	0.0034	1,463	1,463	1.00	828.8	76,791.1

Students

Assumed Number of Graduates per year

						45	48	50	52	54	60	62	62	62	62	62
Gender	Age	Students	% to Work	% External	Total % of Agegroup	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Female	20-24	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Female	25-29	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Female	30-34	5	1.0000	0.0000	1.0000	4	4	4	4	4	5	5	5	5	5	5
Female	35-39	6	1.0000	0.0000	1.0000	4	5	5	5	5	6	6	6	6	6	6
Female	40-44	1	1.0000	0.0000	1.0000	1	1	1	1	1	1	1	1	1	1	1
Female	45-49	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Female	50-54	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Female	55-59	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Female	60-64	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Female	65-69	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Female	70+	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Males	20-24	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Males	25-29	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Males	30-34	14	1.0000	0.0000	1.0000	10	11	11	11	12	13	14	14	14	14	14
Males	35-39	35	1.0000	0.0000	1.0000	25	26	27	28	30	33	34	34	34	34	34
Males	40-44	2	1.0000	0.0000	1.0000	1	2	2	2	2	2	2	2	2	2	2
Males	45-49	1	1.0000	0.0000	1.0000	1	1	1	1	1	1	1	1	1	1	1
Males	50-54	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Males	55-59	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Males	60-64	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Males	65-69	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Males	70+	0	1.0000	0.0000	1.0000	0	0	0	0	0	0	0	0	0	0	0
Total		64				45	48	50	52	54	60	62	62	62	62	62

Migration		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gender	Age												
Female	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Female	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Female	30-34	0	0	0	0	0	0	0	0	0	0	0	0
Female	35-39	0	0	0	0	0	0	0	0	0	0	0	0
Female	40-44	1	1	1	1	1	1	1	1	1	1	1	1
Female	45-49	0	0	0	0	0	0	0	0	0	0	0	0
Female	50-54	0	0	0	0	0	0	0	0	0	0	0	0
Female	55-59	0	0	0	0	0	0	0	0	0	0	0	0
Female	60-64	0	0	0	0	0	0	0	0	0	0	0	0
Female	65-69	0	0	0	0	0	0	0	0	0	0	0	0
Female	70+	0	0	0	0	0	0	0	0	0	0	0	0
Males	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Males	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Males	30-34	0	0	0	0	0	0	0	0	0	0	0	0
Males	35-39	1	1	1	1	2	2	2	2	2	2	2	2
Males	40-44	2	2	2	2	2	2	2	2	2	2	2	2
Males	45-49	1	1	1	1	1	1	1	1	1	1	1	1
Males	50-54	0	0	0	0	0	0	0	0	0	0	0	0
Males	55-59	0	0	0	0	0	0	0	0	0	0	0	0
Males	60-64	0	0	0	0	0	0	0	0	0	0	0	0
Males	65-69	0	0	0	0	0	0	0	0	0	0	0	0
Males	70+	0	0	0	0	0	0	0	0	0	0	0	0
Total		5	5	5	5	5	5	5	6	6	6	6	6

Workforce Losses

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gender	Age												
Female	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Female	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Female	30-34	0	0	0	0	0	0	0	0	0	0	0	0
Female	35-39	0	0	0	0	0	0	0	0	0	0	0	0
Female	40-44	0	0	0	0	0	0	0	0	0	0	0	0
Female	45-49	0	0	0	0	0	0	0	0	0	0	0	0
Female	50-54	0	0	0	0	0	0	0	0	0	0	0	0
Female	55-59	0	0	0	0	0	0	0	0	0	0	0	0
Female	60-64	1	1	2	2	2	2	2	3	3	3	3	4
Female	65-69	2	2	1	1	1	1	2	2	2	2	2	2
Female	70+	3	3	0	1	1	1	1	1	1	1	1	1
Males	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Males	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Males	30-34	0	0	0	0	0	0	0	0	0	0	0	0
Males	35-39	0	0	0	0	0	0	0	0	0	0	0	0
Males	40-44	0	0	0	0	0	0	0	0	0	0	0	0
Males	45-49	0	0	0	0	0	0	0	0	0	0	0	0
Males	50-54	0	0	0	0	0	0	0	0	0	0	0	0
Males	55-59	0	0	0	0	0	0	0	0	0	0	0	0
Males	60-64	7	7	8	8	9	9	10	10	10	10	11	11
Males	65-69	15	15	13	13	14	14	15	15	16	16	17	17
Males	70+	10	10	8	6	5	5	4	4	4	4	5	5
Total		38	38	32	31	32	32	33	35	36	37	38	39

Workforce Size

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gender	Age												
Female	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Female	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Female	30-34	40	36	32	30	28	26	26	26	25	25	25	25
Female	35-39	38	43	46	48	49	50	51	52	52	53	53	53
Female	40-44	56	54	54	54	54	55	56	57	58	59	59	60
Female	45-49	60	59	58	57	57	56	56	56	56	56	57	57
Female	50-54	20	28	34	39	43	45	48	49	51	52	53	53
Female	55-59	25	24	25	27	29	32	35	37	40	42	44	46
Female	60-64	7	9	11	12	13	14	15	16	18	19	20	21
Female	65-69	5	3	3	3	4	4	4	5	5	6	6	6
Female	70+	3	0	1	1	1	1	1	1	1	1	1	1
Males	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Males	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Males	30-34	100	90	82	77	73	70	69	69	69	69	68	68
Males	35-39	102	127	147	163	175	186	197	207	216	222	227	232
Males	40-44	220	200	189	184	183	185	189	194	200	207	214	220
Males	45-49	230	230	225	220	214	210	207	205	205	206	208	211
Males	50-54	185	194	201	206	209	210	210	209	208	208	207	207
Males	55-59	180	181	184	187	191	194	198	200	202	203	204	205
Males	60-64	93	103	111	117	122	127	131	134	137	140	142	144
Males	65-69	45	40	39	41	42	44	46	48	49	50	52	52
Males	70+	54	42	34	29	26	24	24	24	24	25	25	26
Total		1,463	1,463	1,476	1,492	1,512	1,534	1,560	1,588	1,615	1,641	1,665	1,688

FTE Projections

FTEs		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gender	Age												
Female	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Female	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Female	30-34	36	32	29	27	25	24	23	23	23	23	23	22
Female	35-39	32	36	38	40	41	42	42	43	44	44	44	44
Female	40-44	47	45	45	45	45	46	47	47	48	49	50	50
Female	45-49	53	53	52	51	50	50	50	50	50	50	50	51
Female	50-54	18	25	30	35	38	40	42	44	45	46	47	47
Female	55-59	22	21	22	24	26	28	31	33	35	37	39	40
Female	60-64	6	8	9	10	11	12	13	14	16	17	18	19
Female	65-69	3	2	2	2	2	2	2	2	3	3	3	3
Female	70+	2	0	0	0	0	0	0	0	0	0	0	1
Males	20-24	0	0	0	0	0	0	0	0	0	0	0	0
Males	25-29	0	0	0	0	0	0	0	0	0	0	0	0
Males	30-34	99	89	81	76	72	69	68	68	68	68	68	67
Males	35-39	114	143	165	182	196	208	221	232	241	249	255	260
Males	40-44	246	224	211	206	205	207	211	217	224	232	240	247
Males	45-49	252	252	247	241	235	230	227	225	225	226	228	231
Males	50-54	203	213	221	226	229	230	230	230	229	228	227	228
Males	55-59	178	179	182	185	189	193	196	198	200	201	202	203
Males	60-64	92	102	110	116	121	126	130	133	136	139	141	142
Males	65-69	28	25	24	25	26	28	29	30	31	31	32	33
Males	70+	34	26	21	18	16	15	15	15	15	15	16	16
Total		1,465	1,475	1,491	1,509	1,529	1,551	1,578	1,605	1,632	1,657	1,682	1,705
Requirements		1,475	1,495	1,514	1,534	1,554	1,574	1,594	1,615	1,636	1,657	1,679	1,701

Summary of Workforce Projections (based on total population growth + ageing)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Workforce (Headcounts)	1,463	1,463	1,476	1,492	1,512	1,534	1,560	1,588	1,615	1,641	1,665	1,688
Requirements (Headcounts)	1,473	1,492	1,512	1,531	1,551	1,571	1,592	1,612	1,633	1,655	1,676	1,698
Balance (Headcounts)	-10	-29	-36	-39	-39	-38	-31	-24	-18	-14	-11	-9
Workforce (FTEs)	1,465	1,475	1,491	1,509	1,529	1,551	1,578	1,605	1,632	1,657	1,682	1,705
Requirements (FTEs)	1,475	1,495	1,514	1,534	1,554	1,574	1,594	1,615	1,636	1,657	1,679	1,701
Balance (FTEs)	-10	-20	-23	-25	-24	-23	-17	-10	-4	0	3	5
Estimated Size of Pool	0	0	0	0	0	0	0	0	0	0	0	0
Workforce (FTEs hrs/wk)	76,791	77,279	78,114	79,077	80,136	81,263	82,665	84,118	85,511	86,847	88,128	89,359
Requirements (FTEs hrs/wk)	77,316	78,321	79,339	80,371	81,415	82,474	83,546	84,632	85,732	86,847	87,976	89,120
	1,475											

Components of Change

Number (Headcount)

Losses	38	38	32	31	32	32	33	35	36	37	38	39
Reentry	0	0	0	0	0	0	0	0	0	0	0	0
Migration	5	5	5	5	5	5	5	6	6	6	6	6
Students	45	48	50	52	54	60	62	62	62	62	62	62
Net Change	12	15	23	26	28	33	34	33	32	31	30	29

Percent

Losses	2.63	2.61	2.20	2.13	2.12	2.14	2.18	2.22	2.26	2.30	2.34	2.37
Reentry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Migration	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.36	0.36	0.36	0.37	0.37
Students	3.08	3.28	3.42	3.52	3.62	3.97	4.04	3.97	3.90	3.84	3.78	3.72
Net Change	0.81	1.01	1.56	1.74	1.85	2.18	2.22	2.11	2.00	1.90	1.81	1.72

CONCLUSIONS

**Current Shortage or
Oversupply**

0 0 0 -10

Standard Working
Week in Hours

0 0 0 52.4

**Vary Hours Worked
Per Week**

0 0 0 0

Add Additional Hours
per week to demand

0 0 0 N

FTEs hrs/week	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Student Intakes	45	48	50	52	54	60	62	62	62	62	62	62
Workforce (FTEs)	1,465	1,475	1,491	1,509	1,529	1,551	1,578	1,605	1,632	1,657	1,682	1,705
Requirements (FTEs)	1,475	1,495	1,514	1,534	1,554	1,574	1,594	1,615	1,636	1,657	1,679	1,701
Workforce (FTEs hrs/week)	76,791	77,279	78,114	79,077	80,136	81,263	82,665	84,118	85,511	86,847	88,128	89,359
Requirements (FTEs hrs/week)	77,316	78,321	79,339	80,371	81,415	82,474	83,546	84,632	85,732	86,847	87,976	89,120
Balance (shortage)	525	1,043	1,225	1,293	1,279	1,210	881	514	221	(0)	(153)	(240)
% shortage	0.7	1.3	1.6	1.6	1.6	1.5	1.1	0.6	0.3	(0.0)	(0.2)	(0.3)

Medical Workforce Projection Simulation – Assumptions and Explanatory Notes

1. The average hours worked per week by age/gender cohort are assumed to be constant throughout the projection period.
2. The number of losses are those exiting the workforce in the base year (2003). The rate of losses from the workforce is assumed to be constant within each age/gender cohort throughout the projection period. Migration is the net of incoming and outgoing medical practitioners.
3. The annual compound growth rate is the estimated future growth in requirements and is assumed to be equivalent to the projected growth in population plus the impact of ageing of the population during the projection period (source of projected population: Australian Bureau of Statistics).
4. The estimated baseline shortage/oversupply is assumed to be an undersupply of ten medical practitioners.
5. In the 'Conclusions' worksheet, workforce (supply) is the number of medical practitioners (measured in hours worked); requirements are the estimated number of medical practitioners required (measured in hours worked); and balance is the difference between supply and requirements. % shortage indicates the balance between projected supply and requirements (as measured in hours worked) where a negative (-) percentage indicates supply exceeds requirements (oversupply) and a positive percentage indicates requirements exceed supply (undersupply).

APPENDIX D: AMWAC STAKEHOLDER WORKFORCE PLANNING WORKSHOP, SEPTEMBER 2002 - LIST OF PARTICIPANTS

Robert Bain	Australian Medical Association
Margaret Banks	NSW Health
Jeff Borland	University of Melbourne
Peter Brennan	MA International
Allan Carmichael	University of Tasmania
Peter Carver	Department of Human Services, Victoria
Justine Curnow	Secretariat
Richard Eccles	Commonwealth Department of Health and Ageing
Paul Gavel	Secretariat
Carmel Goulding	Department of Human Services, Victoria
Jane Hall	Centre for Health Economics Research and Evaluation
Mary Harris	Secretariat
John Horvath	Australian Medical Workforce Advisory Committee
Susan Jekel-Sadleir	Secretariat
James Jordan	Commonwealth Department of Health and Ageing
Roger Kilham	Access Economics
Brian Lloyd	Department of Health, Western Australia
Richard Madden	Australian Institute of Health and Welfare
Helena Maher	Health Issues Centre
Mary Mahoney	Royal Australian College of General Practitioners
Therese Manson	Commonwealth Department of Health and Ageing
Angela Mikaulades	Commonwealth Department of Health and Ageing
Jennifer Moore	Australian Competition and Consumer Commission
Bronwyn Nardi	Queensland Health
Elizabeth O'Brien	Secretariat
Lynne Pezzullo	Access Economics
Jantze Purton	NSW Health
John Ramsay	Tasmanian Department of Health and Human Services
Chris Ryan	Australian National University
Vino Sathianathan	Royal Darwin Hospital
Beth Slatyer	Commonwealth Department of Health and Ageing
Doug Smith	PALM Management
Leonie Smith	Commonwealth Department of Health and Ageing
Glenice Taylor	Australian Institute of Health and Welfare
David Theile	Committee of Presidents of Medical Colleges
Helen Townley	Tasmanian Department of Health and Human Services
Ron van Konkelenberg	Fresbout Consulting
Jenny Woodhouse	Territory Health Services
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APPENDIX E: SOME USEFUL WORKFORCE PLANNING REFERENCES

Note this is not an exhaustive listing but a summary of references AMWAC has found useful. The list includes references cited in this paper and references that relate to workforce planning methods and specialist medical workforce planning, including references of historical note.

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