

1. Preface

Australian Medical Workforce Benchmarks (AMWAC, 1996), using 1994 data, established empirically derived benchmarks for the Australian medical workforce and found considerable maldistribution of the workforce. The Australian Health Ministers Advisory Council (AHMAC) accepted the recommendations of the report, including the final recommendation that 'the Australian Medical Workforce Advisory Committee periodically examine and review the assumptions and report to AHMAC on the implications of changes in supply of medical practitioners to different sections of the Australian population'. Subsequently the General Practice Strategy Review Report (DHFS, 1998) has recommended that 'AMWAC and the proposed General Practice Partnership Advisory Council collaborate to keep the number of general practice training places under review in the light of emerging workforce trends and provide joint advice to the Commonwealth Health Minister on the number of training places required annually for General Practice'.

This discussion paper represents the first step in the process of examination and review of medical workforce benchmark assumptions. It attempts to explain the supply and demand mismatches that have arisen in the Australian medical care system as it is today and to seek agreement from stakeholders on indicators of segments of the workforce in shortage, in balance and in excess of need. An understanding of the indicators of workforce surplus and shortage, and the evidence presented by those indicators, will provide a firm basis for repeating the Australian medical workforce benchmark analysis, using updated data sources and improvements in methodology, and taking into account changes in government policies and programs since 1995 which impact on the distribution of the workforce.

Potential improvements in methodology are explored in this paper. These take into account responses to *Australian Medical Workforce Benchmarks* (1996), methodology used in other countries, and assessments of refinements to analysis which have been made possible by additional data.

2. Introduction

During the last 20 years the Australian medical workforce has increased much more rapidly than the population. Between 1976 and 1996 the medical workforce more than doubled, from 21,150 to 44,000 practising clinicians, compared with a 30.0% increase in population from 14.0 million to 18.2 million. The population per practising clinician declined by 37.4% from 660.3 to 413.5.

In comparison, with the exception of the nursing workforce (which increased by 32.3% from 1976 to 1996), the numbers of persons employed in other health professions also increased much more rapidly than the population.

Table 1: Health employment and population growth, 1976 to 1996

Health occupation	1976	1986	1996	% increase 1976 to 1996
	(number)			
Medical practitioners	21,150	32,790	44,000	108.0
Dental practitioners	4,550	6,310	7,600	67.0
Other health practitioners	21,080	32,640	45,130	114.1
Nurses	136,000	182,240	179,990	32.3
Total health occupations	182,600	253,970	276,880	51.6
Health industry	363,200	451,870	537,200	47.9
Population (millions)	13.9657	15.9009	18.1920	30.0
	(no. per 100,000 population)			
Medical practitioners	151.4	206.2	241.9	59.7
Dental practitioners	32.6	39.7	41.8	28.2
Other health practitioners	150.9	205.3	248.1	64.4
Nurses	973.8	1,146.1	989.4	1.6
Total health occupations	1,307.5	1,597.2	1,522.0	16.4
Health industry	2,600.7	2,841.8	2,952.9	13.5
	(population per practitioner)			
Medical practitioners	660.3	484.9	413.5	-37.4
Dental practitioners	3,069.4	2,520.0	2,393.7	-22.0
Other health practitioners	662.5	487.2	403.1	-39.2
Nurses	102.7	87.3	101.1	-1.6
Total health occupations	76.5	62.6	65.7	-14.1
Health industry	38.5	35.2	33.9	-11.9

Note: Health industry employment estimated for 1976 from community services employment.

Source: National population census. ABS.

Despite this more than doubling of the medical workforce in just 20 years, significant shortages have remained in important segments of the workforce. These may be partially attributed to growth in patient demand for medical services. This has also been much greater than would be expected just from population growth, due to factors including:

- ageing of the population, as population in the age groups from 55 years and older are the heaviest consumers of medical services – the population aged 55 or more increased by 50.3% from 1976 to 1996, compared with a 26.2% increase for the population under 55 years of age;

- rising real household incomes – the 40.4% increase in average real GDP income per person in Australia from 1976 to 1996 (table 13, appendix) has significantly increased expectations of access to, and the standard of, consumer products and services, including medical services;
- improved access to services – doubling of the medical workforce in only 20 years has on its own significantly improved access to doctors, while 24 hour and other extended hour practice has moved outside the hospital setting, and shortening of hospital stay has freed up hospital beds to permit increased patient access;
- widening of the range of treatable conditions. Examples are joint replacements and organ transplants which have become common rather than infrequent procedures;
- advances in pharmacology, with drug companies continually working to develop new and more effective drugs;
- improvements in diagnosis and treatment methods – patients expect optimum reliability in the medical diagnosis and, in an increasingly litigious society, doctors have increased their use of sophisticated pathology and imaging technology to achieve this. An example of the improvement in treatment methods has been the large reduction in the average length of stay in hospital (from 6.9 days in 1985–86 to 4.3 days in 1995–96), partly due to many major surgical interventions of past years becoming minor procedures through new technology;
- increased consumer education, awareness and expectations – the volume of health information in the media has greatly increased during the last 20 years, disseminating information on medical conditions and encouraging visits to the doctor for both check-ups and treatment;
- lowering of the prices of medical services over time with a rising proportion of private services bulk-billed and accessibility to bulk-billed services greatly increased; and
- demand induced by suppliers (Richardson, 1998).

Evidence of the growth in demand can be seen in the following broad utilisation statistics:

- during the decade from 1985–86 to 1995–96, the number of patients treated in public hospitals other than psychiatric hospitals increased by 47.1% from 2.5 million to 3.6 million; and
- since the introduction of Medicare in 1984–85, there has been a steady increase in the average number of Medicare services per person for males and females in all age groups. The average number of services per person increased from 7.9 in 1986–87 to 10.72 in 1996–97, although part of the increase was due to changes in the Medical Benefits Schedule. Average general practice attendances per person increased by 16.2% during the eight years from 4.76 in 1988–89 to 5.53 in 1996–97.

Geographic matching of the high growth in workforce supply with the strong increase in population demand during the 20-year period was largely left to market forces, both economic and social. Interventions to provide medical services in rural and remote areas have included incentive schemes and support services by government, recruitment of temporary resident doctors to fill area of need positions, outreach programs, use of technology, rural training programs and changes in recruitment of medical students.

The international literature shows that strong interest has developed in medical workforce planning since the 1980s because economic and social market forces, left to themselves, have

created macro and micro mismatches between medical workforce supply and demand. High workforce growth, rather than filling gaps in services, may have worsened maldistribution of the medical workforce. Certainly serious workforce shortages, predominantly geographic, remain in Australia despite rapid workforce growth over a 20-year period.

Furthermore there are unresolved tensions between macro and micro workforce priorities in the various sectors of the workforce. In primary care, there is disagreement, firstly, about the evidence of general practitioner (GP) over-supply in highly supplied areas, and, secondly, in rural areas, about the level of under-supply and whether sufficient doctors are being trained to address workforce shortages. The medical practitioner labour market features low capacity for mobility between jobs in different geographic areas, and there is no such thing as a significant pool of unemployed doctors waiting to apply for vacant positions.

Geographic areas with high workforce supply may be just as likely to experience recruitment difficulties as under-supplied areas. Tension then develops for the former between macro concerns that further adding to supply may exacerbate adverse effects of over-supply, and frustration at the individual practice level at difficulty in recruitment.

In rural areas, there is pressure from overwork and inability to overcome workforce shortages, and worry that action to constrain capital city supply will exacerbate shortages and difficulties in recruitment. Later in this report it will be shown that to a large extent these tensions are a function of the health care financing system which does not provide the price signals which would facilitate remedial action in many other market settings. For example, in an over-supplied GP market in a capital city, the Medicare rebate stops the price of consultations dropping to the point where practices become uneconomic and some practitioners are forced out to less competitive and more remunerative locations. The universality of the rebate across Australia provides no financial weighting for the additional financial and social costs of practice in many geographic or socioeconomically disadvantaged locations, or for higher skill levels and longer consultations which may be necessary.

In the hospital system, there is pressure to follow international trends to reduce working hours to safer levels for doctors and patients, but concern about the future impact of an increase in the non-specialist hospital workforce on the overall medical workforce. In the medical specialties, there is a constant tension between population demands from patients on waiting lists to receive services and the availability of those services across geographic regions, and between the public and private sectors. Macro funding constraints have led to national and State decisions about cost-effective allocation of specialist services, and these conflict with local area desires for improved access. Falling private health insurance coverage has exacerbated imbalances between public and private hospital services.

In this paper's discussion of economic and social market forces, supply adequacy indicators and workforce tensions, there are underlying important planning reasons for assessing and projecting the numbers of doctors required to match the projected patient workload.

First, health services expenditure is a major component of the Australian economy, and in 1995-96 represented 8.5% of GDP. Medical services expenditure has been increasing at a faster rate in real terms than both GDP and health services expenditure. This has been in part a result of a significant shifting of delivery of health services from institutional to community settings. However, workforce supply in excess of numbers needed to improve health outcomes has the potential to lead to medical services being applied that would not otherwise be demanded, with consequent escalation of total health costs.

Second, the distribution of the workforce becomes distorted in circumstances:

- where consumers lack the knowledge in many cases to determine their own demand for services, and suppliers therefore determine to some degree the demand for their services; and
- where consumer demand is high, because pricing of health services to the consumer for an episode of care is either low or nil.

Later in this paper, it will be shown that these circumstances arise in metropolitan areas as a result of competition among GPs that has driven down the price of services to the floor price – the Medicare rebate – for more than 80% of patients. Because the rebate prevents the price falling further with increasing workforce supply, and because volume of services can be expanded by both patients and suppliers at zero cost to the patient, supplier incomes can be maintained in an over-supplied workforce. There is little incentive for suppliers to move to under-supplied areas of significantly higher pricing, particularly when such a move may involve social and professional dislocation.

Third, supply which is assessed as significantly inadequate in a geographic region, or in a health service, has undesirable outcomes, including:

- poor access, unmet need and potentially poorer health outcomes for patients;
- overworked and stressed doctors. The long hours and stress tend to perpetuate the shortage by providing a disincentive to other doctors to move to the under-supplied areas, or, in the case of the public hospital system, to stay in the non-specialist hospital workforce;
- expensive solutions for rural populations when patients are transferred by air ambulance to services, doctors are flown in to deliver an outreach service, rural communities have to provide large subsidies to attract a resident doctor, a higher proportion of patients have to pay out-of-pocket fees than their metropolitan counterparts, and those patients paying may have to pay higher fees; and
- considerable additional expense for the taxpayer when large numbers of overseas-trained doctors per year (1,597 in 1996–97) come to Australia on short-term employment contracts to fill gaps in Australian medical supply provision, although it is acknowledged that use of part of this temporary workforce in the public hospital system is likely to have management and cost advantages.

Fourth, supply which is significantly in excess of levels assessed as adequately meeting community need for similar populations has undesirable outcomes:

- large unnecessary costs in training of the doctor surplus;
- increases in consultations above levels where there is an improvement in health outcomes or where any improvement in outcomes is not justified on cost-benefit grounds. Such increases in consultations may be induced by doctors in over-supplied areas when the average number of patients per doctor falls and competition drives down the price of medical services. Medicare funding which finances unnecessary consultations in over-supplied areas could be better spent elsewhere;
- poorer health outcomes may result from certain types of significant over-servicing such as over-prescribing of antibiotics, discretionary surgical interventions and radiation from unnecessary imaging; and
- consumers disadvantaged when quality falls as patient through-put per hour in doctors' surgeries is increased and less time is spent on average in each consultation. It has been reported that doctors themselves experience rising levels of dissatisfaction with spending less time on average with patients than they would like because of competition and the economics of practice.

Fifth, medical workforce supply has been an area where government has traditionally been involved, usually for public interest or financial reasons. Government is able to exert significant influence on inputs to supply, whereas its capacity to influence demand is very limited. Examples of Commonwealth government intervention in supply include:

- restrictions on medical school intakes and on overseas-trained doctor entry;
- incentives to practise in particular geographic areas;
- requirements for commencement or completion of approved vocational training before doctors can render services under Medicare; and
- funding of selected salaried positions in the Commonwealth medical service, Aboriginal health services, and the defence department.

At the State government level, influences on supply include:

- funding of hospital-based training and employment of medical practitioners, and the infrastructure to support them;
- funding of some salaried community-based medical practitioners in general practice, Aboriginal health, public health and occupational health; and
- subsidies for indemnity insurance in some States for some fields of practice, such as obstetrics.

As a result there is a clear role for workforce planning, and particularly for planning to minimise the divergence between supply and requirements. Medical workforce benchmarks can assist policy makers and planners in addressing the macro and micro planning issues, and can assist medical entrepreneurs and individual practitioners, especially new entrants to the workforce, to make informed choices about options for practice locations. Incorporation of these improvements does however depend on the availability of robust data collections; this issue is discussed in more detail in chapter 10.

To be most useful at the local planning level, these benchmarks must be adjusted for:

- standards for sustainable general and specialist practice, and for sustainable infrastructure including hospitals and community health facilities. 'Sustainable' means at or above minimum standards for quality and financially viable medical care for the type of medical practice. Minimum standards indicators include patient catchment population, numbers of practitioners for seven days per week, 24 hours per day patient care, and medical facilities and support staff required;
- differences in need for medical services associated with differences in population morbidity and mortality arising from the age and sex structure, socioeconomic, ethnic and Aboriginal composition of the population, and exposure to environmental risk factors;
- differences in health service delivery arrangements between institutional and community care; salaried, contracted and private care practitioners; general practitioners, hospital non-specialists and specialists; and doctors and substitute providers including nurse practitioners and allied health professionals including Aboriginal health workers; and
- how much government authorities are willing to pay in subsidies and non-monetary inducements to attract doctors to work in areas of community and professional isolation.

Because of the many years of training needed before full general or specialist practice qualifications are attained, and because of the dynamics of health care change through

research and development and health system management, it is difficult to achieve a lasting balance between supply and demand. However, minimising over- and under-supply is an important goal if scarce resources are to be well used, and essential services provided. Macro decisions, such as the desire for fewer graduates, and micro decisions, such as more doctors in rural areas, must be able to be reconciled.

3. Medical services expenditure in Australia

Barer and Stoddart (1992) offered the following general principle of medical practitioner resource policy for Canada:

The overriding objective of physician resource policy should be to satisfy the health needs of the population that can most efficiently be met by people trained as physicians [doctors], subject to decisions by the population about the resources it is willing to commit to meeting those needs.

In Australia, commentators on medical workforce planning have regularly expressed similar sentiments about the 'right' number of doctors being the number the community is willing to support financially (Brand, 1996a). Kilham (1995) explained the historical perspective, from the 1980s onwards, for government and private outlays on health:

In the 1960s and 1970s, health expenditure expanded rapidly as a proportion of gross domestic product (GDP). Advances in medical science meant that medicine could do more. Patient expectations rose. The 1973 Karmel report recommended an expansion in medical education in Australia and that report was written, of course, in that overall expansionary context. But the expansion in health spending did not continue. In the 1980s, health spending in Australia stabilised at 8 to 9% of GDP.

Tables 12 to 14 in appendix 1 quantify national GDP and health expenditure trends in real terms (expenditure in 1989-90 dollars for all years) from 1976 to 1996. They demonstrate that real growth in GDP provides some growth in government and private capacity to fund additional health services expenditure, including medical services expenditure, although this is affected by changes in taxation, in the share of taxation allocated to health expenditure, and in consumer real disposable income. Over the 20 years, real annual GDP expenditure per person increased by 40.4%, from \$16,886 per person to \$23,838. However, this growth in capacity to pay was insufficient to fully absorb increases due to population growth, the ageing of the population, research and technology creating new treatments, increased service provision by providers and rising expectations from the community. Hence, health expenditure increased from 7.5% of GDP in 1976 to 8.5% in 1996.

The composition of health services expenditure changed significantly over that time, with hospital services expenditure increasing in real terms per person by 50.8%, significantly lower than health expenditure as a whole (56.3%), medical services expenditure (81.5%) and pharmaceutical expenditure (109.2%).

Reasons for this relatively faster growth in medical services expenditure include:

- a significant shift in health service delivery from institutional to community care:
 - shorter average lengths of stay in hospitals, with less invasive treatments, and increased community care in fields including day surgery, hospital-in-the-home, and domiciliary nursing care;
 - a large reduction in psychiatric hospital beds and transfer of patients to community settings;
 - developments in research and technology which have enabled much more diagnostic and treatment work to take place outside hospitals;

- the emergence of 24 hour and other extended hour, private practice, medical clinics as an alternative to hospital accident and emergency departments for many conditions;
- increased medical knowledge which has led to a large increase in medical sub-specialisation, and been a significant contributing factor to the 108.0% increase in medical workforce during the 20-year period;
- an expansion in pharmaceuticals through which GPs can manage patient care in community settings and reduce hospitalisation;
- a degree of consumer-induced demand arising from greater access, greater knowledge of health, higher real incomes and desire to benefit from advances in medicine; and
- a degree of supplier-induced demand from the large increase in medical workforce compared with the 30.0% increase in population during the same period. This is discussed in more detail in chapter 6.

AIHW has analysed growth of health services expenditure in selected OECD countries and found that factors contributing to this growth fall into two categories: i. inflation (both general inflation and excess health inflation); and ii. changes in the level of use of services, from population growth and from more intensive use per person of services. Excess health inflation occurs when health prices are rising faster than the general rate of inflation. In the same way, excess medical services inflation would occur if medical services prices rose faster than the general inflation rate.

The AIHW analysis found that between 1975-76 and 1995-96 average annual health services inflation for Australia was 6.2% per annum, the same as the general inflation increase, so that Australia had no excess health inflation. The country with the highest excess health inflation was the United States, averaging 2.0% per year, while the lowest was France with minus 0.7% per year, ie. health prices were rising at a slower rate than general inflation (AIHW, *Australia's Health 1998*, pp. 169-171).

AIHW has also found that Australia does not have excess medical services inflation. From 1989-90 to 1995-96, the CPI increased by 18.7%, total health prices by 15.6% and the deflator for private final consumption expenditure for doctors by 16.0% (AIHW, *Health Expenditure Bulletin 13*, July 1997).

In providing input to this discussion paper, the Australian Medical Association (AMA) emphasised the importance of the role of technology in changing the composition of health services, to a system with 'much more pharmaceuticals, more medical services, and less hospital services. This trend will continue, resulting in an improvement in the value of the health dollar, achieving better health outcomes and improving the health status of the population'. The AMA also considered that 'increased real expenditure on medical services is an inevitable consequence of the growth in real incomes – complex services including health services will continue to take a larger share of the "basket" of spending by consumers'. The reasons for these trends were discussed earlier in chapter 2.

The AMA believes that, for the reasons given, health services expenditure will continue to rise as a percentage of GDP, as will medical services and pharmaceuticals expenditures. The Retirement Income Modelling Taskforce in 1996 published a scenario that total health expenditure as a proportion of GDP could rise to about 17% by 2041, with health expenditure on the aged fuelling much of this increase (National Commission of Audit, 1996). In 1998, George Rothman of the Retirement Income Modelling Unit in The Treasury analysed several scenarios to 2041 of total health expenditure as a proportion of GDP, based on assumptions ranging from a 1% to a 1.5% per annum productivity gain and health costs

being held at 1% or 2% per annum above inflation. The projections based on these assumptions ranged from 9.3% to 19.1% of total health expenditure as a proportion of GDP (Rothman, 1998). The National Commission of Audit (1996) considered it unlikely that governments and the community would allow health to become a disproportionate burden on national income. Hence it recommended that measures be taken to contain expenditure growth and to increase the contribution to future health and care of those currently working, and those who have retired, who should have financial capacity to do so.

Gibson and Goss (1997), while discussing the scenarios put forward by the National Commission of Audit, note also that 'in the 20 years, 1975-76 to 1995-96, real GDP growth per person was 1.7% per year and real health expenditure growth per person was 2.3% per year. If these growth rates are applied to the period 1995 to 2031, the health expenditure to GDP ratio in 2031 would be 10.4%.'

In this economic context, and with governments examining all options to constrain expenditure, medical workforce supply and demand has emerged as a high profile policy issue. There is a hypothesis that high workforce growth leading to surplus workforce capacity generates supplier-induced demand and unnecessary expenditure. This hypothesis is discussed in detail later in this paper. The greater policy interest lies in why there are significant shortages in some sectors of the medical workforce despite the workforce more than doubling during the past 20 years, and what mechanisms should be used to more fairly distribute the workforce.

In Australia, decisions have been made during the last two years to reduce both medical school intakes and net additions to the workforce from immigration in order to dampen medical workforce growth, while it is also planned to reduce the level of dependence on the use of temporary resident overseas-trained doctors. The annual intake to the GP training program has been approximately halved to 400, and access to Medicare provider numbers for new graduates has been denied until they enter a recognised general or specialist training program. All of these decisions will have the effect of constraining growth in both medical and health expenditure.

4. Patient demand for medical services

4.1 Overview

Illness and injury are the major factors determining patient demand for medical services. These include antenatal and postnatal care and preventive consultations such as periodic screening of persons in apparent good health to identify latent or developing disease, vaccinations, family planning, and planning for overseas travel.

For populations, levels and types of illness and injury are related to:

- age and sex structure. Females have different morbidity patterns to males. Elderly people have the highest levels of ill-health and are a rising proportion of the population;
- ethnicity and Aboriginality. Recent migrants have better health than the community at large, while the Aboriginal population has much poorer health;
- socioeconomic status. Lower levels of morbidity are experienced by populations with high socioeconomic status, and increased morbidity by populations with low socioeconomic status, ie. populations with above average numbers of persons with indicators including income below the poverty line, unemployment, and low educational attainment; and
- lifestyle, occupational and environmental risk factors.

However, patient demand is also influenced by:

- advances in medicine creating new treatments. For example, many sports people who would have retired twenty years ago with a serious knee injury now have a knee reconstruction and are able to compete again;
- what the doctor recommends in terms of self-management, treatments, follow-up visits, referrals to other doctors and other health professionals, hospitalisation and other care;
- public health campaigns;
- media and personal contact dissemination of information on new drugs, new technology, new treatment methods, and access to services;
- marketing, pricing, location, trading hours, perceived quality of service, consultation waiting times and other consumer aspects of medical services;
- changing patient expectations about access to services; and
- employer rules and workplace philosophy on use of sick leave, carer leave and emergency leave that determine whether a medical certificate is required for approval of this leave as paid leave.

It follows from these indicators that patient need and demand are dynamic.

4.2 Changes in society

The 108% increase in the medical workforce between 1976 and 1996 was accompanied by major change in the demographic and social fabric of the population. In chapter 3 of *Australia's Welfare 1997* (AIHW, 1997b), Dr Peter McDonald presents a detailed analysis of socio-demographic change in Australia, projects trends and assesses the effect on future demand for welfare services. These changes in society impact on demand for medical services because of the relationships between health status and the demographic and socioeconomic features of the population, and because medical practice as a services

industry has to adapt to changes in society expectations of all service industries in respect of access and performance.

The changes in society include the following:

- a much more highly educated society than previously. This is correlated with better health status and with higher expectations of access to the benefits of improvements in diagnostic and curative medicine.
- a large increase in the percentages of people who are unemployed or do not have stable employment, elderly and single parents, all correlated with low socioeconomic status and increased morbidity.
- significant change in employment patterns with considerable increases in the female participation rate, the proportion of married women in the labour force and the proportion of mothers in the labour force with children in all age groups. The two parent working household has changed the delivery of service industries to extended hours and seven day a week trading, and produced the consumer environment for seven days a week, extended hours medical centres to flourish. Increased female participation and a sharp rise in part-time jobs have been accompanied by changes in the way society perceives the role of men and women, and led to more 'family-friendly' views of working arrangements that are reducing average hours worked by both men and women, including medical practitioners.

In general, changing demographics, rising national wealth and advances in medicine have changed society's views on health maintenance. There are higher expectations and greater reliance on medical technology. The higher expectations include the beliefs that:

- preventive action such as regular checkups will enable life-threatening and other serious illnesses to be identified early in their development and treatment provided.
- advances in surgery can greatly improve quality of life, such as for the elderly person after hip replacement, the sports person after knee arthroscopy, the factory worker after repair of an industrial injury, and so on.
- advances in drug treatment mean medications can do a lot more.
- advances in vaccination mean common illnesses such as influenza can be avoided for high at risk populations.
- high technology equipment can diagnose and treat many more conditions.

Other fundamental changes in society have included:

- changes in the ethnic composition of Australia through migration. Because migrant applicants with health problems are mostly excluded from migrating to Australia, the health status of the migrant population is higher than that of the population as a whole, while the broader ethnic composition has had positive benefits in such areas as diet where the 'steak and potatoes' diet of earlier generations is now much more cosmopolitan and diverse. At the 1996 population census, 26.1% of the persons counted were overseas-born.
- population change in many rural areas that has affected the viability of many service businesses, including medical practices and pharmacies.

4.3 Changes in population use of health practitioners

The Australian Bureau of Statistics conducted national health surveys in 1995 and 1989-90.

The results show a significantly higher use of consultations with doctors in 1995, despite the number per 1,000 population reporting a recent medical condition (697.3) being nearly the same as the rate of 707.9 in 1989-90.

Table 2: Persons consulting with health professionals during the last 2 weeks: sex, Australia, 1995 and 1989-90

Health professional consulted	(rate per 1,000 population of same sex)					
	1995			1989-90		
	Males	Females	Persons	Males	Females	Persons
Doctor	204.0	261.5	232.9	168.4	231.8	200.1
Dentist	52.7	58.9	55.8	46.5	56.6	51.6
Chiropractor	13.8	17.5	15.7	12.0	13.8	12.9
Chemist	17.3	28.3	22.8	24.7	34.9	29.8
Podiatrist	3.3	7.6	5.5	3.5	7.3	5.4
Nurse	10.0	12.7	11.4	11.0	12.8	11.9
Optician/optometrist	7.1	7.7	7.4	13.8	18.4	16.1
Physiotherapist/hydrotherapist	13.6	12.4	13.0	11.8	15.1	13.4
Other health professional	18.6	28.6	23.6	10.4	15.7	13.0
	(per cent increase to 1995)					
Doctor	21.1	12.8	16.4			
Dentist	13.3	4.1	8.1			
Chiropractor	15.0	26.8	21.7			
Chemist	-30.0	-18.9	-23.5			
Podiatrist	-5.7	4.1	1.9			
Nurse	-9.1	-0.8	-4.2			
Optician/optometrist	-48.6	-58.2	-54.0			
Physiotherapist/hydrotherapist	15.3	-17.9	-3.0			
Other health professional	78.8	82.2	81.5			

Note: Although there appears to have been a large decrease in the rate for persons consulting with opticians and optometrists, 7.1 million persons were estimated to have long-term sight conditions in 1995, compared with 5.4 million in 1989-90. The apparent reduction in the rate of consultations with opticians and optometrists is therefore puzzling.

Source: ABS Cat. No. 4392.0.

The doctor consultation rate increased by 21.1% for males, by 12.8% for females and by 16.4% for persons. However, there was also a 21.7% increase for chiropractors and a 23.6% increase for 'other health professionals', which included audiologists, dieticians, herbalists, hypnotherapists, naturopaths, osteopaths, occupational therapists, psychologists, social workers and speech pathologists.

The National Health Survey estimates are subject to sample error, and to error which may be created by changes between survey periods in perceptions by respondents to question wording. The 16.4% increase in the doctor consultation rate measured by the survey compares with a 10.5% increase in per capita Medicare utilisation of GP services during the same period. However, there is a problem in comparing consultations over time because of changes in medical practice. Both the AMA and RACGP, in submissions to the working group, have indicated their belief that the proportion of short consultations has increased, thereby promoting more frequent consultations, and increasing the proportion of persons enumerated in a two-week survey period. Hence it may be incorrect to conclude that there was a real increase in the rate per 1,000 population of persons consulting a doctor. However, the proportion of the population aged 65 or more increased from 10.9% in 1989 to 11.9% in 1995, and this alone would have led to an increase in the rate per 1,000 population consulting a doctor.

Changes in the consultation profile between the 1989–90 and 1995 national health surveys may be seen in table 15, appendix 1. In 1995, of the 4,206,600 persons who consulted a doctor during the two-week period, 3,792,800 (82.4%) consulted a GP and 739,200 (17.6%) a specialist. By far the most popular reasons for a consultation by both men and women were a respiratory problem (846,000 persons) and a checkup/examination (826,000 persons). The next most common reason was for diseases of the musculoskeletal system and connective tissue (375,000 persons).

The age distribution of persons consulting a doctor shows that 19.7% were aged 65 years and over, the fastest increasing age group in the population. In the 65–74 year age group, 36.3% consulted a doctor in a two-week period, while for the 75 and over age group, the proportion was 42.1%, the highest for any age group.

Table 3: Persons consulting a doctor during the last 2 weeks: age, 1995

Consultation status	Age (years)								Total
	0–14	15–24	25–34	35–44	45–54	55–64	65–74	75+	
	('000)								
Consulting a doctor	730.7	507.4	640.0	551.8	509.0	438.6	489.2	339.8	4,206.6
Not consulting a doctor	3,142.0	2,202.9	2,201.7	2,190.0	1,723.2	1,068.8	858.8	467.2	13,854.5
Total	3,872.7	2,710.3	2,841.7	2,741.8	2,232.2	1,507.4	1,348.0	807.0	18,061.1
	(per cent)								
Consulting a doctor	18.9	18.7	22.5	20.1	22.8	29.1	36.3	42.1	23.3
Not consulting a doctor	81.1	81.3	77.5	79.9	77.2	70.9	63.7	57.9	76.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: ABS Cat. No. 4364.0.

4.4 Health differentials between urban, rural and remote areas

In the 1997 AIHW report, *Rural, Remote and Metropolitan Health Differentials: A Summary of Preliminary Findings*, measures of health status show disparities which suggest a relatively greater need for medical services in the under-serviced rural and remote areas. These disparities are discussed in some detail in the report and are not repeated here.

Feedback from participants at the General Practice Research Workshop in Adelaide on 16 October 1997 was that large rural centres generally have an adequate supply of GPs, and it is in rural areas outside of these that workforce shortages are a significant problem. If this is true, then GP workforce provision in these towns provides a good benchmark against which to measure relative shortage and surplus capacity in other geographic areas, as long as there is no evidence of adverse effects on health outcomes (Schroeder, 1996).

To evaluate this, one first has to consider the non-medical influences on health outcomes for large rural centres. These include the following.

- Because of immigration rules, new migrants have better health than the rest of the population (*Australia's Health 1994*). Migrants are more concentrated in metropolitan areas, and this lifts the health status of metropolitan areas compared with rural and remote areas.
- According to the ABS index of socioeconomic disadvantage, large country towns have lower socioeconomic status than capital cities, with large country towns falling in the 3rd, 4th and 5th quintiles (*Australian Medical Workforce Benchmarks, 1996*). This is associated with poorer health status.
- Large rural centres have, on average, a 3.1% Aboriginal population compared with 1.0% in capital cities and 1.7% in other metropolitan areas. Because Aboriginal health is so

poor, if all else was equal, large rural centres may be expected to have slightly higher morbidity than metropolitan areas, similar health status to small rural centres and other rural areas (with 2.8% and 2.6% Aboriginal population respectively), but somewhat better health status than remote areas centres (12.6% Aboriginal population) and other remote areas (25.9%) (table 16, appendix 1).

These influences suggest that age-standardised morbidity and mortality statistics would show poorer health status for large country towns than for metropolitan areas, and similar health status with small towns, but significantly lower morbidity and mortality than for remote areas.

The role of medical practice in improving health outcomes is discussed in section 4.7. In 1995–96, there were 6,133 GP consultations per 1,000 persons in capital cities compared with 4,853 consultations per 1,000 persons in large country towns, a difference of 26.4% (table 18, appendix 1). If such a high differential in medical servicing was to have a positive effect on health outcomes in capital cities, one would expect to see a positive effect over and above that which would be expected on the basis of advantages in socioeconomic status, Aboriginality and the proportion of migrants. This is not readily apparent from tables 19 to 21, appendix 1, where:

- age-standardised mortality for large rural centres is 7.7% higher for males and 6.0% higher for females than for capital cities, with the difference for males largely because of increased road accidents and injuries, and for females mainly because of increased coronary heart disease. The medical influences on mortality from road accidents and injuries and on coronary heart disease are far less than the environment, lifestyle and diet influences which cause these;
- age-standardised hospitalisations for large rural centres for males are about the same as for capital cities, but are 5.6% higher for females because of higher rates of childbirth; and
- in respect of risk factors, the proportions of persons in large country towns who are overweight, smoke and have not had a pap smear test during the last three years are on a par with capital cities. They have relatively more persons at risk for high alcohol consumption, hypertension and diabetes, but relatively fewer persons with hypertension and not using sun protection (AIHW, 1997).

4.5 Self-assessed health status by geographic area

The Australian Bureau of Statistics says that 'self-assessed health status is considered a major factor in the usage of health services and other health-related actions, and a determinant of health-related lifestyle behaviours such as smoking, diet and exercise. As such, perceived health status complements measures of ill-health in the analysis of health-related actions and needs for health services, and is an important consideration in the development and targetting of preventive health programs' (ABS, Cat. No. 4363.0). The Bureau found that how people rated their health was strongly related to their illness experience (ABS, Cat. No. 4364.0).

In the 1995 National Health Survey, respondents were asked directly how they rated their health in general, from excellent to poor. The results across geographic areas for Australia are remarkably similar, with 16.4% of metropolitan residents rating their health fair or poor, compared with 17.1% of residents of rural centres, and 16.9% of residents of other rural and remote areas (table 22, appendix 1).

Australian Medical Workforce Benchmarks (1996) noted significant variation in the average number of GP consultations per person among State capital cities, with Sydney the highest

with 7.2 and Hobart the lowest with 5.8. Next highest were Melbourne and Brisbane with 6.6, and next lowest Adelaide and Perth with 6.2 and 5.9. The similarity in health self-assessment levels across cities, with the exception of a three percentage points poorer assessment for Hobart, suggests that the higher GP consultation levels in the larger capitals may not be associated with better perceived health status. This can be explored further using analysis of additional health status measures collected in the National Health Survey.

4.6 Population dispersion

In 1995, the population concentration in Australia's capital cities averaged 339.4 persons per sq. km. Large country towns had 59.0 per sq. km., small country towns 18.4, other rural areas 2.6, remote centres 0.3, and other remote areas 0.1 persons per sq. km. (table 16, appendix 1). The implications on medical workforce need of very low population concentrations are discussed in the following.

In table 4, Medicare consultations for vocationally registered GPs in 1995-96 are collated with average weekly hours worked in direct patient care for these doctors, as reported in the December 1995 national medical labour force survey. The final two columns show that consultations per unit of time drop significantly for geographic areas outside the metropolitan centres.

Table 4: Vocationally registered general practitioners: Medicare consultations and direct patient care hours worked, 1995-96

Locality	Providers	Consultations ^(a)	Consults. per provider	Av. weekly hrs. worked in direct patient care	Hours worked per year ^(b)	Average consultations per hour	% of capital city rate
Capital city	12,076	62,008,050	5,135	40.7	22,608,687	2.74	100.0
Other metropolitan	1,293	7,144,840	5,526	43.2	2,569,450	2.78	101.4
Large rural centre	1,068	5,247,420	4,913	42.0	2,063,376	2.54	92.7
Small rural centre	1,080	5,347,360	4,951	44.1	2,190,888	2.44	89.0
Other rural	1,874	8,436,360	4,502	45.6	3,930,902	2.15	78.3
Remote centre	158	640,020	4,051	45.4	329,967	1.94	70.7
Other remote	162	601,800	3,715	49.9	371,855	1.62	59.0
Total	17,711	89,425,850	5,049	41.7	34,065,125	2.63	95.7

(a) by location of provider.

(b) assuming an average of 44 weeks per year, taking into account leave, commencements and withdrawals. However, assumptions of fewer or more weeks worked per year for all GPs do not change the ratio in the final column.

Sources: DHFS, AIHW.

This increasing differential with remoteness may be due to a number of factors:

- higher through-put rates, on average, for fully bulk-billing practices in metropolitan areas.
- increased patient travel requirements for rural doctors for outreach services in particular. In 1994, the Australian Bureau of Statistics found that most Aboriginal people living in rural areas received services from a visiting doctor, not a resident doctor.
- significantly higher numbers of emergency after hours and hospital visits for rural GPs (DHFS, 1997b).
- differences in health service delivery arrangements in rural areas. To avoid delays in provision of emergency care to rural residents, patients are more likely to be admitted to

hospital. Once admitted, they are more likely to have a longer stay in hospital for a course of treatment than a city dweller with readily accessible hospital-in-the-home, domiciliary nursing and outpatient services. In rural areas, a GP is more likely to have a contract with a hospital to provide care to patients. In 1993, two-thirds of teaching hospitals had GP involvement, 87.0% of base hospitals and 90.0% of district hospitals (DHFS, 1997a).

- increased population morbidity in rural and remote areas that may be expected to increase the length of a consultation. Despite higher population morbidity, much lower consultation rates with GPs, most notably for males, also suggest that country people are less likely than city people to attend a GP for minor illnesses and injuries, and therefore rural GPs may expect to have a lower proportion of short consultations.

Population dispersion has three further important effects on medical workforce requirements.

- The economics of GP practice makes it desirable that practices achieve economies of scale by employing around four or more practitioners. The Australian Bureau of Statistics found that large GP practices (6 or more practitioners) had an operating profit margin of 43.1% and return of assets of 75.1% in 1994-95, compared with an operating profit margin of 23.9% and return of assets of 30.6% for small practices (1 or 2 practitioners) and an operating profit margin of 28.3% and return of assets of 67.7% for medium practices (3-5 practitioners) (ABS, 1997). This suggests a minimum catchment population of 4,000 to 5,000 people, depending on the working hours of the practitioners. However, every rural centre with 1,000 or more people wants its own doctor. This is not unreasonable for the large tracts of Australia where rural centres are widely dispersed and population densities in between the centres are low. Hence, rural and remote areas have a much higher proportion of solo and small practices than metropolitan areas (DHFS, 1997a).

In reality, the large tracts of dispersed rural centres in mainly inland Australia are likely to always need a significant proportion of solo practitioners. However, for such solo doctor practices to be viable, financially and otherwise, under current remuneration arrangements, they will continue to need annual recurrent government subsidies to attract and retain practitioners. A partial alternative policy option being considered by some State health departments, and discussed by Newbery (1997), is to enhance the primary care role of registered nurse practitioners in specified areas of inland Australia to reduce the demand for a doctor in every small town. Unlike other health occupations, nurses are currently well-distributed across metropolitan, rural and remote regions of Australia (AIHW, 1997). An indication of the number of nurses being considered was provided by the announcement by the New South Wales Government in August 1998 that it intended to seek legislation to establish up to 40 nurse practitioner positions in selected areas of the State where there is demonstrated local need, local agreement and local support for them.

- Solo and small-practice GPs in dispersed population areas need locum support for annual leave. In metropolitan areas, large group practices can use internal rostering to cover leave arrangements and small practices can choose to simply close doors for annual recreation leave, with patients re-directed to other GPs in the local area.
- Specialist practices need much larger catchment populations for viable practice than GPs, and, for much of rural and remote Australia, this implies greater responsibility for GPs for basic specialist services. A number of State Governments provide rural GPs with subsidies for professional indemnity insurance to ensure adequate obstetrics services are provided.

4.7 The role of medical practice in improving health outcomes

The preceding discussion in this chapter poses fundamental questions. What role has increasing doctor supply had in improving actual health outcomes? Will adding more doctors to the workforce improve health outcomes?

This issue was examined in some detail in *Making It Better*, the National Health Strategy Background Paper No. 8 (1991).

It describes health as a product of:

- biology;
- lifestyle, eg. smoking accounts for 20% of all deaths in Australia;
- health care services;
- environment; and
- the economy of the country: richer countries can greatly reduce environmental risk factors influencing health, and spend more on other public health measures and on clinical health care.

It drew heavily on analyses of mortality and data from other sources in the books by Thomas McKeown, *The Role of Medicine* (1979) and *The Origins of Human Disease* (1988). Registration of cause of death began in Sweden in 1751, in France in 1801, in England and Wales in 1838, and in Ireland in 1871. McKeown calculated declining mortality in these countries by type of disease and noted the years in which immunisations and other major medical interventions were introduced.

He found that most of the advances in health outcomes during the last 200 years can be attributed to:

- improvements in lifestyle and living conditions (mainly improved nutrition, better housing and clean water supplies) which have greatly reduced disease by elimination or reduction of the origins of disease. In Europe, in the period of 100 to 200 years ago, and where people live in third world conditions today, infectious diseases predominate as causes of sickness and death because of defective hygiene and crowding, insufficient food lowering resistance to communicable diseases, close contact with domesticated and other animals which are the probable causes of many micro-organisms, and human populations large enough to establish and amplify some human infections.
- immunisation campaigns which have almost completely eliminated some of the infectious diseases.
- many of the drugs introduced this century.

With the exception of some Aboriginal populations living in third world conditions, these are not particularly relevant to Australia today. Modern day improvements in health outcomes include:

- a rapid decline in deaths from cardiovascular disease, the main cause of death in Australia. This decline has been mainly attributed by epidemiologists to a reduction in two risk factors: smoking and blood pressure – the latter, a combination of better diet and increased medication to lower high levels. A smaller but significant contribution has been made by medical and ambulance services.
- the significant contribution of medical and other health services to saving lives through
 - immunisation and screening programs;
 - public education, eg. HIV infection contained in Australia;

- treatment of trauma;
- successful treatment of some cancers and increasing length of survival from cancer;
- and
- reduction in cardiovascular deaths.
- contributions by medical services in improvement of quality of life through hip replacements and other interventions, and improved care of people with chronic and terminal conditions.
- falling motor vehicle mortality rates because of better roads, better traffic management, compulsory seat belts, random breath testing and speed cameras, and improved accident and emergency services.
- reduced numbers of births with genetic defects and other abnormalities through prenatal screening and increased use of termination of pregnancy.

Dr Ian Ring, Director of the Epidemiology and Health Information Branch of the Queensland Health Department, has compared Australian Aboriginal morbidity and mortality with US and Canadian Indians and New Zealand Maoris. He found that in the 1980s the three overseas indigenous peoples had an expectation of life 10 years or more greater than Australian Aboriginal people, whose life expectancy was at the same level of the others 30 to 40 years earlier. Ring's recommendations to improve Aboriginal health outcomes highlight the complex range of determinants of health. These recommendations were:

1. 'A whole of government approach to the fundamentals – land, housing, water, jobs, law and order, education'.
2. In terms of health services, to 'tackle cardiovascular disease, respiratory disease, diabetes, hypertension etc from a health and a social point of view'.
3. Improve the workforce skills to address the issues through increasing the numbers of Aboriginal and Torres Strait Islander doctors and health professionals ('the US Indian Health Service has hundreds of Indian doctors and health professionals to draw on') and by forging partnerships between health services and national bodies such as the Aboriginal and Torres Strait Islander Commission (Ring, 1992).

In 1995, the Australasian Cochrane Centre was established at Flinders Medical Centre in Adelaide as part of the International Cochrane Collaboration to prepare, maintain and promote evidence-based medicine. It is expected that, over time, this will reduce variation in practice, unnecessary treatment and under-use of some treatments, leading to improvements in the efficiency and effectiveness of the medical workforce.

On the basis of the historical analyses, some hypotheses on the relationship between doctor supply and health outcomes include:

- Adding to doctor supply should improve health outcomes in areas of significant medical workforce shortage, as this would increase access for medical emergencies and for screening for conditions where early intervention results in improved outcomes.
- Adding to supply should improve outcomes in medical specialty and sub-specialty fields where technology and drug treatment advances are creating net additional new treatment options which can be demonstrated to advance health outcomes in morbidity, mortality or quality of life.
- There are diminishing returns in adding to doctor supply from a position of shortage. In apparently adequately to well-supplied areas, historical evidence is lacking that increasing supply will improve health outcomes.

- Increased use of evidence-based medicine suggests potential for existing workforce to be used more efficiently and effectively in achieving population health outcomes.

A further hypothesis advanced later in this paper is:

- Increasing supply beyond certain levels in at least some medical fields will create adverse outcomes, for example, increasing the numbers of surgeons beyond the point where they have sufficient patients to maintain skills.

It is likely that the greatest advances in health outcomes during the next 20 years will arise from increased national wealth improving socioeconomic status and health-related lifestyle of the population and improving national and local public health infrastructure, improved social infrastructure for disadvantaged Aboriginal and non-Aboriginal populations, new drugs, new vaccines, increased immunisation, and technological advances in medical equipment which will extend treatment boundaries. The medical workforce will have a strong role in facilitating these advances.

However, the role of the doctor and the way medicine is practised will also change over the next 20 years. For example, Internet, other computer, and popular media access to evidence-based medicine will strengthen consumer knowledge and empowerment and change the doctor-patient relationship and the way medicine is practised. The Internet is already being used by health consumers for international dialogue on best treatments for medical conditions. In the United States, consumer demand has led to Internet sites becoming available for local and international medical consultations, where money is paid by credit card and advice given is referenced to the medical literature (personal communication, Ray Rogers, former head of the UK NHS Information Management Service, and currently leader of an international G7 committee on health informatics).

There is concern about the regulatory aspects of this form of medical practice. Nevertheless, with legislative safeguards on the bona fides of practitioners, and on advice given without in-person examination, it would seem inevitable that Internet and telemedicine sites linked to evidence-based medicine databases will become available in Australia during the next 10 to 20 years, with the potential to transform the practice of medicine and workforce allocation, given the scope for such sites to market themselves internationally.