Australian Medical Workforce Advisory Committee
Australian Institute of Health and Welfare

AUSTRALIAN MEDICAL WORKFORCE BENCHMARKS

**A report for the
Australian Medical Workforce Advisory Committee
by the Australian Institute of Health and Welfare**

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Abbreviations

ABS	Australian Bureau of Statistics
AHMAC	Australian Health Ministers Advisory Council
AHMC	Australian Health Ministers Conference
AIHW	Australian Institute of Health and Welfare
AMA	Australian Medical Association
AMWAC	Australian Medical Workforce Advisory Committee
ASWPE	Adjusted standard whole patient equivalents
CME	Continuing medical education
COAG	Council of Australian Governments
DHSH	Department of Human Services and Health (Commonwealth)
DPR	Doctor to population ratio
EC	European Community
FTE	Full time equivalent
GP	General practitioner
GP Branch	General Practice Branch of the Department of Human Services and Health
HIC	Health Insurance Commission
HMO	Health maintenance organisation
MBS	Medical Benefits Schedule
MJA	Medical Journal of Australia
MWDRC	Medical Workforce Data Review Committee
NCEPH	National Centre for Epidemiology and Population Health
OECD	Organisation for Economic Co-operation and Development
OMP	Other medical practitioner
OTD	Overseas trained doctor
RACGP	Royal Australian College of General Practitioners
RACS	Royal Australasian College of Surgeons
RARA	Rural and Remote Areas
RE	Relative endowment
RMO	Resident Medical Officer
SEIFA	Socioeconomic Indicators for Areas, Australian Bureau of Statistics
SSD	Statistical subdivision
SWPE	Standard whole patient equivalents
UK	United Kingdom
USA	United States of America

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Terms of reference of AMWAC and the Benchmark Working Group

The Australian Health Ministers' Advisory Council (AHMAC) established the Australian Medical Workforce Advisory Committee (AMWAC) to advise on medical workforce matters, including workforce supply, distribution and future requirements.

AMWAC held its first meeting in April 1995.

AMWAC Terms of Reference

1. To provide advice to AHMAC on a range of medical workforce matters, including:
   - the structure, balance and geographic distribution of the medical workforce in Australia;
   - the present and required education and training needs as suggested by population health status and practice developments;
   - medical workforce supply and demand;
   - medical workforce financing; and
   - models for describing and predicting future medical workforce requirements.
2. To develop tools for describing and managing medical workforce supply and demand which can be used by employing and workforce controlling bodies including Governments, Learned Colleges and Tertiary Institutions.
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.

Benchmark Working Group Terms of Reference

A target of 200 doctors per 100,000 of population was adopted by the Australian Health Ministers Conference (AHMC) as a desirable medical workforce supply target in the National Medical Workforce Strategy in 1992. However it was never specified whether the figure of 200 referred to all medical practitioners licensed to practise, all employed medical practitioners, or just practising clinicians. It was also not known whether the count should be expressed as total numbers or full time equivalents (FTEs).

At its first meeting, AMWAC agreed to establish a Working Group chaired by Dr. Bruce Armstrong, then Director of the Australian Institute of Health and Welfare (AIHW), to review this target and determine benchmarks for supply of medical workforce in Australia.

The terms of reference were:

1. Review and critically assess relevant world literature on determining benchmark supply of medical workforce for a population and the approaches adopted in other countries similar to Australia.
2. Identify the major measurable factors that determine need and demand for medical workforce in Australia and those that determine the contribution of individual doctors to meeting this need and demand.
3. Propose one or more options for determining an appropriate benchmark for supply of general practitioners and medical specialists in Australia at a particular point in time

and, with each, a method for periodic review of the benchmark to take account of changes in the factors that determine need and demand and the contribution individual doctors make to meeting them.

4. Recommend supply targets for the years 1995, 2005, 2015 and 2025, based on these benchmarks, making reasonable assumptions about trends in the factors which influence the benchmark.
5. In the event that a credible approach to setting benchmarks cannot be proposed, propose one or more alternative approaches that AMWAC might use in developing its recommendations to AHMAC about management of medical workforce supply.

Professor Ralph Doherty of Uniquest Limited was contracted by the Working Group to assist in the work program to address the terms of reference, and to produce a report. Data analysis was undertaken by the AIHW with the assistance of the General Practice Branch (GP Branch) and the Medicare Estimates and Statistics Section in the Department of Human Services and Health (DHSH), and Professor Doherty. This report was prepared by the AIHW, and summarises a substantial report by Professor Doherty and AIHW data analyses concluded subsequent to finalisation of the Doherty report.

Following formation of the AMWAC Working Group, on 15 June 1995, the AHMC agreed that a comprehensive strategy is required on both supply and demand issues of the medical workforce in Australia, and that the major medical workforce demand issues include access to specialists and other medical services, particularly in provincial, rural and remote areas. Ministers noted that AMWAC was created to provide advice on a comprehensive strategy and requested AMWAC to report to the next meeting of AHMC on short, medium and long term strategies to address both supply and demand issues. This meeting was scheduled for April 1996. Prior to that meeting AHMAC is to meet in February 1996 and consider this report.

Membership of the AMWAC Benchmark Working Group

Dr B Armstrong, AIHW and AMWAC - **Chair**

Dr H Britt, Family Medicine Research Unit, University of Sydney

Ms M Carter, Health Issues Centre and AMWAC

Dr W Coote, Australian Medical Association (AMA) and AMWAC

Professor R Douglas, National Centre for Epidemiology and Population Health (NCEPH)

Dr O Dent, Department of Sociology, Australian National University

Mr J Harding, AIHW - **Secretary**

EXECUTIVE SUMMARY AND RECOMMENDATIONS

Executive summary

1. This report has estimated benchmarks per 100,000 population for Australia in 1994 of 240.6 total employed medical practitioners, 222.0 FTE medical practitioners, 221.1 practising clinicians and 205.1 FTE practising clinicians. This provision of practising clinicians is 3.4% lower than the 1994 workforce of 229.0 clinicians per 100,000 population.
2. The country most similar to Australia in demographic profile and workforce mix is Canada which had 219.1 practising physicians per 100,000 population in 1993, a ratio which has been declining following reductions in medical workforce training numbers and a re-orientation of training to be "preferentially in disciplines identified as areas of need and those identified as emerging specialties".
3. In the USA health maintenance organisations employ much lower numbers of physicians per 100,000 patient population than in the population at large through substitution of service provision by other health professionals. In Britain there has been a reduction in utilisation of specialists and hospital services following the introduction of general practice fund-holding. In Australia future coordinated care arrangements may greatly change medical workforce requirements, depending on the funding, structural and organisational arrangements including the extent of substitution of provider services. This study has noted but not considered these issues in developing and projecting medical workforce benchmarks.
4. OECD statistics show medical workforce growth well in excess of population growth over many years for most OECD countries, and also steady growth in the number of medical consultations per capita since the 1960s. The literature indicates that population ageing, growth in technology, growth in the range of treatments available, patient demand for the best treatment available, and provider interest in providing the best treatment for each patient within financial constraints are the main contributors to the growth in per capita utilisation. The 1995-96 Commonwealth budget papers project continuing high growth in per capita utilisation in Australia through to 1998-99.
5. The general practitioner workforce is in considerable oversupply in the capital cities and other major urban areas of Australia, and significant undersupply in rural and remote areas. The urban oversupply is estimated at 4,400 (2,900 FTE) and rural undersupply at around 500 (445 FTE).
6. Urban general practitioners on average have significantly smaller patient loads, provide significantly more consultations per patient, and have a lower fee per patient consultation. Despite the smaller patient workloads for general practitioners (GPs) in urban oversupply areas and much heavier loads in remote areas, the annual level of remuneration for the average full time practitioner appears to be around the same in urban and rural areas. However for roughly the same level of remuneration (excluding any rural relocation incentive payments and other factors), the rural doctor has a more complex workload, works much longer hours and is on call for much longer periods of time outside hours actually worked. The Rural Doctors Association of Australia has also collected data that the average number of callouts per night for small town GPs in rural Victoria is 1.9 compared to 0.3 for suburban doctors, while weekends average 10.5 call-outs for rural doctors and 1.4 for suburban GPs.

7. State and Territory health authorities have identified eighteen medical specialties experiencing shortages in the public hospital system but current monitoring systems are largely inadequate for quantifying these shortages.

8. Inter-state comparisons of specialist workforce provision indicate significant shortages in Queensland, Western Australia and Tasmania, while New South Wales appears to have a relative oversupply among the non-surgical specialties.

9. Medicare utilisation of specialist services by persons living in rural and remote areas is much lower than by metropolitan residents, and a significant overall increase in specialist numbers may be needed to effectively address this.

10. Information on shortages in the non-specialist workforce in public hospitals needs further discussion, as while absolute shortages are probably around 300 to 400 the long hours worked by such medical practitioners suggests considerable capacity to employ significantly more practitioners at reduced hours.

11. Despite the oversupply of general practitioners, the employment by locum agencies of temporary overseas trained doctors and other anecdotal evidence suggests a shortage in the locum workforce, but there are no data available to reliably quantify this.

12. Projections of current medical workforce supply indicate that the 1995 Commonwealth government decision to reduce medical school intakes, if fully implemented, would result in around 4,500 fewer medical practitioners in the year 2025. Over the same period, a reduction in net additions to the workforce from overseas trained doctors of 100 per year would achieve a workforce reduction of around 3,000 doctors.

13. Over the next 30 years, the population of Australia is expected to increase by 28.9% but the ageing of the population is projected to increase Medicare utilisation by 43.5% during the same period, assuming Medicare utilisation by the population remains at 1994-95 levels. However Medicare utilisation has been projected by the DHSH to continue to increase at a much faster rate than this for the next few years. Additional demand factors based on advances in medicine were therefore modelled to test assumptions about the adequacy of projected supply.

14. Benchmarks are dynamic and need to be adjusted annually to take account of growth in population need. The medium level demand projections in this report provide preliminary benchmarks over the next 30 years for the total and clinical workforce against which supply performance can be assessed.

15. The current national medical workforce policy of net migration additions to the workforce of 200 per year and medical school graduations of 1100 in 2001 and 1000 per year thereafter appears to be consistent with projections of workforce demand over the next 15 years, assuming there are no major changes in requirements for medical workforce as a result of re-engineering provision of health services in Australia. Overseas experience indicates that the use of health maintenance organisations, the introduction of formalised coordinated care arrangements and greater substitution of care by other health professionals could substantially change medical workforce requirements in Australia.

Recommendations

It is recommended that

1. The 1994 benchmark for supply of medical workforce in Australia be 205 FTE clinical practitioners per 100,000 population.

   This benchmark assumes a uniform distribution of medical services supply in relation to need across areas of service.

2. For the purposes of projection of this benchmark into the future, the moderate demand scenario be adopted. That is that growth in demand due to population growth and ageing of the population will be 1.17% per year and that growth due to other factors will be 0.6% per year. This scenario will increase the benchmark to 220 FTE clinicians per 100,000 population in 2005, 245 FTE clinicians per 100,000 population in 2015 and 270 FTE clinicians per 100,000 population in 2025.

3. The planning of supply of medical practitioners qualified to practise in Australia be based on a scenario that assumes that the

   - number of graduates of Australian medical schools qualified for permanent residence in Australia will fall from the present 1200 per year to 1000 per year from the year 2002;
   - average net addition of overseas trained doctors (including New Zealand graduates) to the Australian medical workforce will be 200 per year;
   - hours worked by male doctors will gradually fall by an average of 5 hours per week by 2025;
   - proportion of total medical practitioners who are female will gradually increase by 12.2 percentage points by 2025.

4. In association with supply changes made in response to recommendation 3, effective action be taken in the same timeframe to reduce maldistribution of supply of medical services across service areas to the lowest possible level.

5. AMWAC 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.

1. THE WORLD VIEW

Summary data for 1992 and 1993 for Organisation for Economic Co-operation and Development (OECD) countries can be seen in Table 1. Unfortunately there are only two countries which are demographically similar to Australia, have around the same mix of general practitioners and specialists, and provide comparable workforce data to the OECD. These are Canada, with 219 doctors in clinical practice per 100,000 population, and New Zealand with 197, compared to 226 per 100,000 population for Australia. Data for the United Kingdom (UK) relates to the National Health Service only, counts hospital staff as FTEs, and excludes part-time medical officers. United States (USA) data refers to FTEs of 35 hours or more per week. A number of other countries count all doctors licensed to practise, instead of only those practising. These under-counts and over-counts make comparisons with the OECD "average" meaningless.

Table 1: Practising physicians, OECD countries, 1993

Country	Practising physicians (a)	% female	GP's as % of total physicians	Popn. ('000)	Per cent aged 65+	Median age	Physicians per 100,000 population	Physician contacts (b) per pers.	Physician consultns. (c) per doctor
Australia	39,942	23.2	46.3	17,656	11.7	33.0	226.22	10.6(5.4 GPs)	6,219 (GPs)
Austria	19,491	27.2	48.9	7,991	14.9	35.0	243.91	5.1	3,996
Belgium (1992) *	36,178	25.2	41.2	10,045	15.0	37.0	360.16	8.0	3,210
Canada	63,008	24.5	46.6	28,753	11.2	34.0	219.14	6.9('90)	3,858
Denmark (1992)	14,657	28.8	25.0	5,170	15.6	37.0	283.50	5.6	na
Finland (1992) *	12,929	44.8	43.3	5,042	13.8	37.0	256.43	3.5	1,862
France	159,448	30.7	50.4	57,500	14.0	35.9	277.30	6.3	4,748
Germany (1992)	209,255	29.0	38.7	64,865	15.4	37.0	322.60	11.5	na
Greece (1992)	38,738	29.0	37.1	10,314	14.8	39.0	375.59	5.3('82)	na
Iceland	779	17.2	22.0	264	10.6	29.1	295.08	4.2	5,800
Ireland (1992) *	6,007	na	na	3,547	11.4	28.0	169.35	6.6	na
Italy (1992) *	93,845	24.0('88)	na	56,757	14.5	36.0	165.35	11.0	na
Japan (1992) *	211,498	11.7	na	124,200	11.9	37.0	170.29	12.9	9,100
Mexico (1994)	92,304	na	34.6	88,465	na	19.7	104.34	na	na
Netherlands (1990)	37,461	na	21.1	14,944	13.1	37.0	250.68	5.7	8,551
New Zealand	6,872	26.6	38.7	3,480	11.0	32.0	197.47	3.8('81)	na
Norway (1992)	13,826	18.5 ('85)	21.9	4,286	16.1	37.0	322.59	5.7('85)	2,185
Portugal *	28,769	40.9	21.2	9,988	14.1	32.0	288.04	3.1	1,248
Spain *	159,291	32.4	na	39,083	13.4	32.0	407.57	6.2	na
Sweden	26,100	35.0	17.3	8,719	17.6	37.0	299.35	3.0	na
Switzerland	21,238	23.9	19.6	6,989	14.9	37.0	303.88	6.0	na
Turkey	61,050	22.3	56.9	59,869	2.7	22.0	101.97	2.0	na
U. K. (1992) *	87,820	26.4	38.5	57,998	15.7	37.0	151.42	5.7('89)	7,089
USA (1992) *	603,400	16.9('90)	9.7	265,100	12.2	32.0	227.61	5.5('90)	6,735
Total	**2,043,906**			**951,025**			**214.92**		

Notes:
(a) The OECD definition of 'practising physicians' is 'the number of general practitioners and specialists, excluding qualified physicians working abroad but including doctors licensed to practise'. There is ambiguity in how this may be interpreted, and application of the definition varies. A number of countries count all doctors licensed to practise, not those actually practising.
* denotes a count definitely not compatible with data for Australia.
(b) Sum of ambulatory care contacts (in physician offices, home visits, billed phone consultations) divided by the population. For most countries, this is for GPs only.
(c) Sum of ambulatory care contacts divided by the number of doctors.
Source: OECD Health Data File, 1995 and OECD Health Systems, Facts and Trends 1960-1991, Volumes 1 and 2.

What OECD trend data does show, however, is that the medical workforce in the great majority of OECD countries has been growing rapidly and well in excess of population

growth. Canada is an exception in that it has reduced a 4% pa growth rate in the 1980's to a 2% pa rate in the 1990's, and the 1991 Canadian doctor to population ratio (DPR) of 224 per 100,000 fell to 219 in 1993.

Information was assembled, from the literature and by correspondence, on approaches to medical workforce planning in other western countries, including UK, USA, Canada, New Zealand and Europe. Some wide contrasts in approach were found.

Thus the UK health system differs from Australia's in important ways: the capitation payment for general practice; the tightly controlled hospital service, with controlled number of consultants and registrars in the various specialities; the small element of fee for service practice; the concern about movements of doctors between member states of the European Community (EC). It is not surprising that workforce management can be by minor adjustments to the status quo. The target list size for British general practitioners is a population of 1700.

It has not been possible to obtain an authoritative statement on USA national medical workforce policy, apparently because there isn't one. Again the system is very different from that of Australia, although the current major American concerns with adjustments, possibly quite traumatic ones, towards a "managed care" system of delivery of care, and the overwhelmingly market driven approach to all aspects of society, have obvious relevance to some matters of current debate in Australia. Health maintenance organisations (HMOs) employ considerably fewer general practitioners and specialists per 100,000 patients than service the US population as a whole, with efficiencies achieved by mechanisms such as substitution of medical services by nurse practitioners, and reductions in referrals to specialists by primary care physicians.

In Canada growth has been halved and now is "preferentially in disciplines identified as areas of need and those identified as emerging specialties".

Respondents in New Zealand advised that "workforce planning was discontinued in 1989...The New Zealand Government has recently taken a number of policy decisions regarding health sector training..the establishment of separated purchasers of pre and post entry training. The Ministry of Education is responsible for pre entry training and Regional Health authorities have been made responsible for purchasing post entry clinical training...These decisions have reduced the role of the Ministry [of Health] in influencing health sector workforce development".

Each of the countries about which information was obtained, with the exception of the USA and perhaps New Zealand, has a system for national overview of medical workforce and applies various measures to control it. In no case was there a pre-determined benchmark of how large that workforce should be to best meet national needs. The usual approach was to identify the current numbers, project them forward on best estimates of additions and subtractions from the workforce and the population, and make adjustments in the light of the degree of satisfaction expressed with the status quo. This is of course an accurate description of the approach taken in Australia in the past.

A useful overview, although from an American perspective, was provided by the USA General Accounting Office (1994). It stated:

"As of 1990, the number of practicing physicians per 100,000 inhabitants ranged from 140 in the United Kingdom to 310 in Germany compared with 230 in the United States..As few as 18% of Sweden's doctors are primary care physicians, and as many as 58%..in the United Kingdom..compared with about 34%..in the United States" [where general internists and pediatricians are counted as primary care physicians]. UK, Sweden and Canada, unlike the USA, manage their medical workforces by regulating entry to medical schools, and Germany attempted to do so but quotas were rejected by its Supreme Court. The particular points chosen for emphasis, as indicated by the paragraph headings, were "Regulatory strategies...school enrolment and training limits..employment limits..incentive-based strategies..fee modifications ..physician autonomy..countries try to manage physician resources in underserved areas".

A summary from the USA General Accounting Office report of the workforce management approaches in each country follows:

Canada: For the 1993 academic year, provinces cut first-year medical school enrolment by an average of 8%, with further reductions planned for 1994. In addition, the provinces intend to trim the number of first-year residency positions by lowering the number of foreign medical school graduates allowed in Canadian residency programs". A table listed 51,841 physicians in Canada in 1990: 27,334 primary care, 2,429 general internists, 1,487 general pediatricians, 20,591 other specialists.

Germany: 1993 reform legislation was controversial and likely to meet court challenge. It "calls for (1) ceilings on physician posts to control overall numbers..and (2) reforming the physician reimbursement system to reduce the income disparity between primary care and specialist physicians". Physician to population ratios were negotiated across planning zones, initially on the basis of existing supply but to be finalised by 1999. On the new designation, the mix, in percentages, will be: Hospital and office based physicians - primary care general practitioners 15; general internists 4; general pediatricians 2; other specialists 79. Office based physicians only - primary care general practitioners 37; general internists 11; general pediatricians 4; other specialists 48. At present 40% of practitioners are office-based.

Sweden: "Historically, the government has managed Sweden's aggregate physician supply by controlling medical school enrolment...officials use approximately 13 year time frames..for projecting future physician supply needs." In 1993 reform legislation attempted to enhance the role and ultimately the supply of primary care physicians, by "centralizing the primary care physician's role in the delivery of health services..providing greater autonomy to currently salaried primary care practitioners". Primary care is provided by a salaried service, with no hospital access. Numbers in 1991: family and general practitioners 3,909, general internists 2,629, general pediatricians 1,234, other specialists 14,234, total 22,006. The aim is for 1 primary care physician per 2,000 against present 1 per 3,400. "..officials developed this goal by examining the appropriateness of their current..ratio and also by examining other countries' ratio."

U K: "A government-sponsored physician manpower committee recently projected a shortage of physicians ..over the next 10 to 20 years and recommended increasing medical school enrolment by about 6%..In 1990 the United Kingdom had roughly 140 physicians per 100,000 inhabitants..In 1990..[it] had about 57,000 physicians, of which about 58% were primary care physicians..As of

> April 1991 ..a group practice with at least 7,000 patients can choose to become...a fundholding practice..As of March 1993 about 25% of all patients were cared for by a fundholding practice..Table: 56,923 total, 32,970 primary care, 6,900 general internists, 848 general pediatricians, 16,205 other specialists. Proportion of specialists [28% by these figures] would increase to 47% ..if senior residents (called 'senior registrars') were counted in the specialist ranks (revised table, total 61,981, primary care 32,970, senior residents on specialty training 5,058, specialists 23,953).

Canada, with a national health system not unlike that of Australia as well as a medical workforce of comparable size, would seem to offer a more relevant model for Australian practice than UK, with its tightly controlled National Health Service, and USA, with its free market approach. That being said, the search of the literature and attempts to open up correspondence with overseas policy makers and workforce researchers gave disappointingly little guidance on methodologies that might be used in developing benchmarks for Australia.

2. THE NEED AND DEMAND DIMENSIONS

It is customary in studies of medical workforce to use the actual number of services provided as a measure of demand, leaving aside the question of how much demand for services remains unsatisfied. Health surveys by the Australian Bureau of Statistics (ABS) and other agencies consistently show that only a minority of people with what they recognise as illnesses seek medical assistance, and it is likely that the size of that minority will be influenced by many factors such as ease of access to medical care. On that basis "demand" may have a complex relationship to practitioner availability.

In 1993-94 over 180 million services were provided under Medicare, an increase from 113 million in 1984-85. Of those, almost 97 million services were for general practice or other unreferred services, increased from about 64 million 9 years earlier. The total number of services per capita increased from 7.2 in 1984-85 to 10.1 in 1993-94, and for general practice services from 4.1 to 5.4. To these must be added the substantial number of services provided by the public sector, for which comprehensive statistics are not available. There is anecdotal evidence of cost-shifting operations such as the closure of outpatient services which may have contributed to the increase in demand for Medicare services. Another important unknown is the extent to which, because of reasons related to medical workforce or other factors, demand for medical services is not being expressed or met.

Much "demand" for medical services, and therefore for medical workforce, flows from "need". The important distinctions between them relate to considerations of efficiency and effectiveness in provision and delivery of health services, and the recognition that some demands for services may be in excess of need. Medical workforce provision therefore, while related to the current and future clinical needs of the population, must be qualified by community perceptions that demand indicators such as waiting lists fall within tolerable ceilings.

That "need" and "demand" are not easily separated is evident in the Medical Workforce Data Review Committee (MWDRC) 1994 Annual Report comment that "future demand for general and specialist medical practitioner services depends on a complex matrix of determinants including: age / sex cohort utilisation; age / sex cohort population projections; changes in age / sex cohort morbidity and mortality; access to services - a declining rural

and increasing urban share of population improves access and increases utilisation; waiting time for access; extent of substitution of health care services between allied and alternative health professionals and general practitioners, and between general practitioners and specialists; changes in technology; new drugs; changes in medical practice in preventive medicine and in diagnosing and treating particular conditions, including the duration and frequency of consultations, and the diagnosis and treatment protocols; new specialties; prices paid by consumers for medical services and the health insurance status of the population; socio-economic status of the population as higher socio-economic status is associated with better health outcomes, and low socio-economic status with poorer health status; level of health education of the population; the rate of growth of malpractice litigation and measures taken by the medical profession in self defence (eg increases in specialist referrals and diagnostic testing and withdrawals by GPs from some service areas, which increase the total volume of medical services provided)."

Two of these factors need special attention:

(i) the ageing of the population and its effect on total number of services. AIHW projections indicate that a 1% increase in population would generate about a 1.2% increase in consultations, assuming no increase in per capita consultations in each age group. After 20 years a 23.6% projected increase in population generates a 28.5% increase in consultations. On that basis, a base rate DPR of 200 per 100,000 population would need to rise to about 241 per 100,000 population after 20 years to account for the ageing of the population. Population growth and the ageing of the population will lead to an increase in demand for medical practitioners during the next 20 years and this increase is estimated to be around 28%, representing about 13,000 medical practitioners in total or about 11,300 FTEs.

(ii) the progressive increase in demand by the population. The Australian experience of increasing doctor consultations per capita per annum over many years (4.4 in 1969, 10.4 in 1994-95) is paralleled by steady, but generally less steep, rises in almost every other OECD country. For example, the USA: 4.6 in 1981, 5.5 in 1990; the UK, 4.3 in 1976, 5.7 in 1989. It sees a number of possible reasons for Australian increases in utilisation of medical services in all age groups, in addition to supplier-induced demand, population growth and population ageing, including: increased availability of specialised pathology and technology-derived diagnosis and procedural services; the stock of knowledge in medicine is ever increasing, and with it the number of medical specialties and sub-specialties and the role of general practitioners as gate-keeper to referral to a specialist; media coverage of personal health care and preventive medicine has increased enormously; the population as a whole is more highly educated; improved access to medical services in both urban and rural areas; increasing urbanisation with a higher proportion of the population living in very close proximity to medical services; the re-structuring of the health system to greater community care and reduced institutional care leading to an enhanced community care infrastructure; the role of the general practitioner is being refined, as in the introduction of vocational registration which provided financial incentives for greater use of preventive medicine, longer consultations where appropriate, more after hours visits, and more time spent on continuing medical education; increasing litigation and rising costs of litigation insurance mean an increase in referral to specialists and an increase in tests ordered.

The increase in utilisation of Medicare services from these additional factors has been greater than the combined effects of population growth and ageing. This is illustrated in

'Chart 4. Growth in Medicare Benefits Outlays' on page 3-94 of the 1995-96 Commonwealth Budget papers (Commonwealth Treasury, 1995), where the cost of growth in utilisation not accounted for by population growth and ageing is projected to continue to increase to 1998-99 at a rate greater than the combined effects of population growth and ageing.

In addition to the documented growth in met demand, there are indicators of unmet demand that must be taken into account in policy formulation, in addition to indicators of unmet need. For example: the difference in number of services per person between rural and urban areas may have multiple causes, one of which may be unmet demand in the rural areas; waiting lists for elective surgery are clear evidence of unmet demand, part of which will be for operations (eg cosmetic surgery) which may go beyond actual medical need.

3. THE MEDICAL WORKFORCE CONTRIBUTION TO MEETING NEED AND DEMAND

The National Health Labour Force project at AIHW has estimated the number and characteristics of medical practitioners active in Australia. Preliminary figures for 1994 are that there were 47,300 registered medical practitioners in Australia including 44,400 in the medical workforce and 2,900 outside it. The workforce included 490 looking for work and 43,940 actually employed. Of these, 41,456 were clinicians which included 18,673 general practitioners, 14,918 specialists, 5,187 hospital non-specialists and 2,677 specialists in training. (As these figures were still being finalised during preparation of this report, the 1994 Australasian Medical Publishing Company estimate of 44,337 employed practitioners was used in all calculations).

General practitioners and other primary care medical practitioners worked on average 49.4 hours per week. Males averaged 54.8 hours, 47.8 in direct patient care, and a further 19.8 hours were on call but not worked. Females averaged 36.1 hours, 31.6 of these in direct patient care, and a further 9.1 hours on call not worked. In 1993-94 primary care practitioners provided 96.6 million Medicare services.

Specialists averaged 53.4 hours per week. Males worked 55.0 hours, 48.2 of these in clinical care, with a further 26.4 hours on call but not worked. Females worked 42.9 hours, 37.9 of these in clinical care, with a further 16.1 hours on call not worked. They provided about 80 million Medicare services in 1993-94. The 42.4 million pathology services billed to Medicare comprised over half the services provided by specialists.

Non-specialist hospital doctors, excluding specialist trainees, recorded an average work pattern of 55.2 hours per week, 56.2 hours for men and 53.2 hours for women. Males averaged 52.4 hours of clinical care and a further 8.7 hours a week on call but not worked. Females averaged only a little less with 49.5 hours of clinical care and 6.3 hourson call.

Specialist trainees averaged the longest hours of all, with males working 61.8 hours, 51.5 in clinical care and a further 14.9 hours on call not worked, while females worked 55.8 hours, 47.3 in clinical care, with a further 10.9 hours on call not worked. One reason for these averages being higher than for other groups is a lower proportion of part-time practitioners in the trainee workforce.

Overall, male medical practitioners in clinical practice averaged 55.5 hours a week, providing 48.7 hours of clinical care, with an additional 20.9 hours on call not worked. Female practitioners averaged 42.2 hours, providing 37.5 hours of clinical care, and an extra 10.1 hours on call not worked.

A variety of factors influence the contributions made by individual practitioners to meeting the needs and demands of the community. In some cases trends are evident which if continued would influence future workforce needs. They include:

1. The contribution of the average practitioner: 5% of general practitioners, 7% of specialists, and 5% of hospital non-specialists worked 80 hours or more per week in 1993, equivalent to two FTEs but counted as only one. Along with consideration of total hours worked must go some concern with the changing roles of medical practitioners, changing standards for numbers of consultations in new roles compared to present roles, substitution of services between general practitioners and specialists, and among medical practitioners, nurse practitioners and other health professionals, and hours worked by medical practitioners in the future in the different public and private health care settings. (AIHW 1995).

2. Age and sex distribution of the medical workforce. These are important influences on the workload undertaken, as indicated by hours worked or number of services provided. Male medical practitioners worked an average of 55.5 hours per week, compared with 42.2 hours for female medical practitioners. There is some evidence that the difference is becoming less over time. Thus Conn (AIHW, 1995), who noted that "the percentage of females in the total medical practitioner workforce rose from 19% in..1981..to 28.7% in..1991" and that "in 1991 females comprised 44% of the under 30 age group with medical qualifications and also 44% of practising medical practitioners," found that "in the period 1981 to 1991, the percentage of females less than 30 years of age with medical qualifications who were not practising medicine declined from 29.5% to 16.8%, which is near parity with males in the same age group." Female non participation rate peaked in the 30-34 age group at around 25-28% with non participation in 1986 and 1991 declining to a low of 16-18% in the 45-49 age group.

   Data from the 1981, 1986 and 1991 population censuses, suggests that average hours worked have fallen for males, with a small increase in the proportion of males working part-time (AIHW 1995).

3. Falling average hours worked. Conn (1995) found that "the 1991 pattern of non participation for men of all ages is significantly above that evident in the previous two censuses. For the first time, the 1991 non participation pattern for men less than 40 years of age roughly parallels that for women although at a lower rate".

4. AIHW (1995) commented: "Falling average hours worked and earlier retirement need to be considered in supply modelling of medical workforce over the next 20 years", with attention to such possibilities as: job sharing, permanent part time work and other changes to medical practice; the effects of new technology; whether health care utilisation for some age cohorts in the population might decrease with rising health status; whether mass screening and immunisation of the population will increase in the future and which health professionals should undertake them.

5. Clinicians in the total workforce. "In 1992-93, of the total medical workforce of 43,341 medical practitioners employed in medicine, 39,942 (92.2%) were practising clinicians, in their main, second or third jobs. The remainder were administrators, educators, researchers, occupational or public health physicians, or other non-clinicians who undertook no clinical practice. The DPR for employed medical practitioners was 246.7 per 100,000 population, while the DPR for clinicians was 227.3, with the FTE DPR for clinicians about 204 per 100,000 population.". At any time ABS census data indicates that 3% or more of clinicians are on leave from practice. If this is factored into the calculations, then the FTE DPR for clinicians falls to 198 per 100,000 population. (AIHW, 1995)

6. Geographic maldistribution. The range of DPR in rural areas indicates, inter alia, current career choice of practitioners. Such choices may have little relation to the varying supply requirements for geographic areas with populations having significantly above normal morbidity and mortality, or for threshold populations for practice of specialties. Instead they reflect such factors as "needs for continuing education and interaction with fellow practitioners to maintain skill levels, and other issues which influence provision of services to non-capital city areas." (AIHW 1995).
7. The specialty mix of the medical workforce and its ability to cover the range of demands on it.
8. The extent of other (ie non-clinical) demands on the time of practitioners (eg travel between places of practice, continuing medical education, teaching, administration, research). In addition to this, if general practitioners are to be the principal care coordinators in a re-organisation of the health system to coordinated care models as part of the Council of Australian Governments (COAG) reforms, Douglas (1995) has argued that the reduced clinical workload and increased care coordination workload for such practitioners will have a significant impact on workforce requirements.
9. The support available to practitioners (eg locum tenens cover for periods of continuing medical education, office practice support and delegation of some components of practice).
10. Patterns of retirement from practice, partial or complete, temporary or permanent, followed by practitioners.
11. The DHSH has calculated from 1991-92 Medicare data that 82.5% of the male population and 91.4% of the female population have at least one service per year for which Medicare benefits are paid. Of those people who visited a doctor in 1993-94, there were 5.4 general practitioner attendances per capita, and 2.4 general practitioners, on average, were consulted for these 5.4 attendances. Only 37% of persons with GP attendances consulted just one general practitioner (1994-95 HIC Annual Report). This lack of continuity of care for most persons attending general practitioners is less efficient, and may produce lower quality care, than if a higher proportion of the population was seeing a single practitioner. In geographic areas of significant oversupply, multiple use of general practitioners is more likely to occur. Greater efficiency in workforce provision, and possibly improved care, would be achieved by any significant movement of practitioners from areas of oversupply to those experiencing shortages.

4. BENCHMARKS AND THEIR REVIEW

The key question is one asked by AIHW (1995): whether "the health system we want to have in 20 or 30 years time [will be] the health system we have now with significantly more or fewer doctors?" On 2 February 1995 AHMAC held a workshop on medical workforce and the report of that workshop notes many issues which impinge on the setting of benchmarks to meet desirable health system outcomes in the future:

- geographic maldistribution, with undersupply in rural areas and oversupply in metropolitan Sydney and Melbourne;
- structural maldistribution, and in particular the public / private mix, inappropriate tasking of junior medical staff, lack of Aboriginal people in medicine, and too few specialists being trained in some fields to meet community needs;

- escalating Medicare outlays;
- inappropriate medical school intakes and guaranteed access to intern training;
- lack of control on the numbers of overseas trained doctors (OTDs)
- lack of knowledge in relating workforce characteristics to need and demand;
- inhibition of the proper development of continuity and quality of care;
- lack of clinical research capacity.

The health system of the future therefore is likely to be one where progress has been made in addressing these workforce problems of the current system. In fact an outcome of the AHMAC workshop was agreement to prepare an options paper on the structure and financing of health services in, say, 2005. This would “take account of problems, objectives and apparent solutions and provide a basis for workforce supply and demand management in the future”. AMWAC was set a number of tasks including providing “AHMAC with advice on dealing with the implications of the options including workforce supply numbers, roles, education, and labour force substitution” and providing advice on mechanisms to overcome shortages in specialist groups.

The current benchmark of 200 practitioners per 100,000 population set by AHMAC in 1992 lacks an empirical foundation and furthermore did not specify whether the 200 was meant to include all Australians with medical qualifications, all who hold current licences to practise, or practising clinicians, and whether the practitioner count should be expressed as FTEs or total numbers. An overall ratio must be considered against a well-recognised gradient from urban to rural areas, with rural areas showing fewer doctors per unit of population, fewer services per member of the population and more services per practitioner than urban areas.

The whole point of establishing benchmarks for medical workforce is to provide the basis for predicting what workforce size and composition will be desirable in the future, and to monitor whether the desirable level has been achieved. Commentators on medical workforce have therefore emphasised trends already evident that will influence future needs and demands. The ageing of the population, the rise in demand for medical services evident in Australia and other western countries, advances in medical technology, changes in the patterns of delivery of health care, changes in the work style of practitioners, have all been seen as important. Several approaches have been suggested as leading to benchmarks for medical workforce supplementary to the various transformations of DPR: international comparisons, economic indicators especially the level of payment required beyond the Medicare rebate ("copayment"), waiting lists, the proportion of practice delivered part-time. Also it has been suggested that benchmarks might be based on units other than practitioner numbers, especially number of services and number of patients serviced.

The various considerations raised in previous chapters present a range of approaches which might be used to develop benchmarks for medical workforce. Benchmarks might be expressed as the relation to population, for the whole country or particular sections of it, and for the whole medical workforce or its identifiable components, of total number of qualified medical practitioners, number registered for practice, number actively employed in medicine, or number practising as clinicians, each as actual numbers or as FTEs as determined by various conventions. Alternatively benchmarks may be expressed in terms

of number of services or number of patients served per practitioner. Benchmarks may be derived from, or tested against, basic considerations of morbidity and current medical practice, international comparisons or economic considerations such as the level of copayment in various areas or various specialties.

5. THE AIHW DATA ANALYSIS TO ESTABLISH 1994 BENCHMARKS

5.1 Overview

Table 2: Estimated medical workforce benchmarks, Australia, 1994

	FTE's	Actual
1. Total workforce		
Total	40,317	44,337
Clinicians	37,300	40,859
2. Oversupply		
Primary care (GPs & OMPs)	2,911	4,356
3. Undersupply		
Primary care (GPs & OMPs)	445	511
Hospital non-specialists	360	400
Specialists		
(a) Inter-state:		
Surgeons	101	148
Non-surgeons	254	372
(b) Urban-rural within State	900	1,318
(c) Total	1,255	1,838
Locums	150	200
Total undersupply	2,210	2,950
5. Benchmark workforce		
Total	39,616	42,931
Clinicians (=1-2+3)	36,599	39,453
6. Benchmark workforce per 100,000 popn.		
Total	222.0	240.6
Clinicians	205.1	221.1
7. Actual 1994 workforce per 100,000 popn.		
Total	226.0	248.5
Clinicians	209.0	229.0

Benchmarks for the 1994 medical workforce in Australia were established by the following adjustments to the actual 1994 workforce:

- subtracting the estimated oversupply of primary care practitioners in urban areas;
- adding the estimated undersupply of primary care practitioners in rural areas;
- adding the estimated undersupply in the hospital non-specialist workforce;
- adding the estimated undersupply in the specialist workforce;
- adding an estimated undersupply in the locum workforce.

The methodologies used to achieve these estimates are documented in the following sections. In respect of the primary care (general practice) and specialist workforces, two

different scientific approaches have been used to estimate the workforce requirements to meet population need. Both indicate major problems of urban oversupply and rural shortage, which overall result in a total medical workforce with a serious maldistribution problem and some oversupply.
In respect of the hospital non-specialist workforce, the shortage figure is considered a "ball-park" estimate based on vacancy and temporary OTD employment data, but the number is relatively low and a substantial error will not significantly affect the benchmark calculation. The same applies to the estimate for the locum workforce which could best be described as an educated guess.
Four benchmarks have been set to meet the different planning needs for FTE and total workforce, for clinicians and the workforce as a whole.

5.2 The general practitioner workforce

"Urban oversupply is the single most important problem that GPs face....An oversupply of providers in a service industry has many effects.....More providers share a given patient population so, on average, each GP has fewer patients. GPs are therefore in competition with each other to increase their market share. This can be achieved by working longer hours, charging lower fees, providing services that people want (which may differ from their medical needs), working from accessible, well-designed premises, advertising, branching into gimmickry, or selectively servicing the quick-fix end of the market...Having fewer patients and charging lower fees, GPs have to crank up the volume of services they provide in order to maintain practice revenue. This may involve performing unnecessary procedures, ordering unnecessary investigations (needing follow-up visits to disclose results to the patient), encouraging patients to attend for minor ailments and checking the whole family when only one child is sick." Dr Bob Allan, President, Australian Association of General Practitioners, Australian Doctor, 3 February 1995

The Allan portrait of general practice oversupply provides a set of hypotheses that can be tested empirically:

- relatively fewer patients per doctor;
- more consultations per patient;
- fees will on average be lower;
- the service mix may be less complex.

The reverse can be hypothesised about under-supplied rural areas:

- relatively more patients per doctor;
- fewer consultations per patient;
- fees will on average be higher;
- the service mix may be more complex.

AIHW used three data sources to test these hypotheses and to develop formulae to quantify the extent of workforce maldistribution:

- 1994 Medicare data from the Better Practice Program database of the GPractice Branch;
- 1992-93 and 1994 data from the AIHW national medical labour force survey database;
- 'A comparison of country and metropolitan general practice', Family Medicine Research Unit, Department of General Practice, The University of Sydney, a supplement to The Medical Journal of Australia, 1 November 1993.

Clearly the size of the need for general practice services in a given geographic area will depend on characteristics of the population known to be associated with health status: age, sex, socio-economic status, education, morbidity, occupation mix, and public health aspects such as quality of housing and water supply.

In 1994 Mr Gordon Calcino in the GP Branch developed a methodology of relating individual patients to practitioners rather than services to practitioners, which also took into account the age and sex of patients. "Standardised whole patient equivalents" (SWPE), defined as "a measure of practice size in terms of patient load, are derived as follows:

- if a patient has visited only one general practice, that patient will be counted as one whole patient equivalent for the practice.
- if a patient visits more than one general practice then the patient will be counted as a fraction of a whole patient equivalent for each practice seen. This fraction will be calculated by dividing the Schedule fee value of GP consultations provided to the patient by the practice, by the total value of all GP consultations received by the patient.
- compared to the overall average, elderly patients and women in certain age groups generally require more consultations per patient and the young and healthy tend to require less. The Whole Patient Equivalent value is standardised (or adjusted) to account for these differences. The standardisation process is based on National Medicare and Department of Veterans' Affairs claims figures for each age and gender category...The standardisation is achieved by allocating each patient to one of 16 age and sex groups and multiplying the Whole Patient Equivalent for each patient by the appropriate weight seen below:

Table 3: Age by Sex Weights for SWPE Standardisation

Age (years)	Male	Female
less than 1	0.929	0.932
1-4	1.189	1.112
5-14	0.688	0.699
15-24	0.633	0.938
25-44	0.729	1.012
45-64	0.963	1.199
65-74	1.355	1.623
75+	1.808	2.183

- the SWPE for a practice is the sum of the Standardised Whole Patient Equivalent value of each patient attending the practice during the 12 months."

In the GP Branch database the Australia-wide average ratio was 970 SWPEs per FTE doctor. There were some assumptions: for example, the Medicare definition of "full-time" practitioner was used.

AIHW then matched the ABS SEIFA Index of socio-economic disadvantage at postcode level with 1989-90 ABS national health survey data on doctor consultations per person. This found that there was no significant difference in the number of consultations for the top four quintiles, but consultations in the 5th (lowest) quintile of social disadvantage were 9% higher. In A Social Health Atlas of Australia (1992), Glover and Woollacott noted that the National Health Strategy found higher standardised rates of doctor visits for people in low income families, and standardising for health status and illness conditions indicated that “people in low income families are using around the expected level of doctor services given their poorer health status and larger number of illness conditions”.

Accordingly SWPEs in all postcode areas in the 5th SEIFA quintile were increased by 9% to create adjusted standardised whole patient equivalent workloads (ASWPEs). The total

ASWPE's for Australia was 15,902,111 and this corresponded to a consultation workload of 98.37 million.

The number of FTE doctors (using Medicare earnings of $65,870 per annum as the cut off point for full-time) was then calculated for each postcode area. However postcode area proved to be too small a geographic area for practical analysis and was aggregated to statistical subdivision (SSD). This presented a problem only in Melbourne and Brisbane where due to a statistical quirk each whole city is defined as a SSD. Postcodes were then aggregated using similar SEIFA scores to approximate SSD equivalents of other cities. The Rural and Remote Areas classification (RARA) of the DHSH was also used in higher level analyses classifying the geographical location of practice to capital city, other major urban, rural major, rural other, and remote.

Workforce data from the AIHW national labour force survey database for 1994 was correlated with this data to establish linkages with hours worked and type of practice.

A summary of the main relationships can be seen below:

Table 4: Characteristics of primary care practitioner workload, 1994

	Capital cities	Other major urban	Rural major	Rural minor	Remote
Average % co-payment (a)	7.5	7.3	12.2	11.3	19.5
Average consultations per patient	6.8	6.4	5.4	5.6	4.5
Average ASWPE per FTE GP/OMP	982	1,078	1,230	1,164	1,362
Estimated average FTE income - 1 (b)	173,359	178,779	179,974	175,208	176,878
Estimated average FTE income - 2 (c)	129,212	133,251	134,142	130,590	131,835
Average total hours worked	46.9	51.0	50.7	54.4	58.5
Average clinical hours worked	41.1	42.9	43.4	46.5	47.0
Average hours on call not worked	11.4	15.5	22.7	38.3	41.8
Per cent working full time (40 hrs+)	61.0	65.9	68.2	73.8	75.4
Percentage of time worked in:					
private rooms	92.0	90.4	94.6	95.3	74.1
hospitals	3.1	4.5	2.5	1.4	8.9
Aboriginal health services	0.2	0.2	0.4	1.0	6.2

Notes:

(a) defined as fees charged less benefits paid as a percentage of benefit paid.

(b) Based on a Medicare level B consultation fee of $24.15, this multiplies the doctor fee charged by average consultations by average AWSPE. This is indicative only. Any different base fee will show a similar income pattern by geographic class.

(c) Same calculation as (b) but using an average Medicare fee of $18.

Sources: Medicare statistics, GP Branch, DHSH; AIHW national labour force survey

The trends by geographic area support the hypotheses if it is assumed that there is oversupply in capital cities and undersupply in remote areas. It can be seen that for, on average, approximately the same full-time practitioner revenue, general practitioners in rural and remote areas work significantly longer hours, and have much longer hours on call and not worked. The following selected statistics from the 1993 Family Medicine Research Unit study further illustrate the differences in type of practice across geographic class, and the increased complexity of rural compared to metropolitan practice. In addition to these, the Rural Doctors Association of Australia has collected data that the average number of callouts per night for small town GPs in rural Victoria is 1.9 compared to 0.3 for suburban doctors, while weekends average 10.5 for rural doctors and 1.4 for suburban GPs.

Table 5: Characteristics of GP's in country and metropolitan general practice

	Small towns	Medium towns	Large towns	All country	Metro - politan
Characteristics of GPs (percentages):					
% female	13.4	10.5	14.1	12.7	27.1
Age <35	13.5	18.1	12.9	14.8	17.2
Age 55+	30.0	19.1	9.3	17.6	22.1
Years in general practice <6	9.1	14.0	6.2	9.5	19.5
Years in general practice >10	77.6	62.8	61.5	65.9	59.3
Solo GP	40.2	15.3	17.9	22.6	29.3
4+ GPs in practice	12.2	45.9	60.7	43.7	29.7
Any salaried or sessional work	35.6	37.3	33.9	35.2	20.4
Place of graduation: Australia	67.5	81.5	81.2	77.9	76.8
Place of graduation: UK	19.2	8.5	9.0	11.3	6.0
Workload characteristics:					
Encounters per week	147	156	154	153	116
<60 encounters per week (%)	1.0	0.8	4.0	2.2	13.2
200+ encounters per week (%)	12.4	16.6	10.2	12.8	4.3
Home visits per 100 encounters	2.2	3.0	2.6	2.6	7.3
GP MBS services (%)	78.9	81.2	89.1	84.2	91.7
Hospital services (%)	17.5	12.7	3.4	11.1	1.7
Obstetrics (%)	1.9	2.7	1.7	2.1	0.2
Operations (%)	2.3	2.2	2.3	2.2	1.2
Types of treatment as % of encounters:					
Prescription(s)	59.1	61.2	63.8	61.9	65.0
Other treatment(s)	29.3	28.8	31.0	29.9	31.9

Source: 'A comparison of country and metropolitan general practice', MJA, supplement 1/11/93

The next step in the analysis was to quantify the levels of oversupply or undersupply in each SSD by comparing actual provision of general practitioners with the number required on the basis of ASWPE workload. To do this means determining what is a reasonable annual patient load for a full-time metropolitan GP and then scaling that ASWPE load downwards for rural practice to allow for the increased complexity of the workload. A number of relationships were tested for the strength of the correlation co-efficient:

Relationship	**Correlation**
% co-payment and consultations per patient	-0.49
Consultations per patient and average ASWPE per FTE doctor	-0.35
Rural classification and consultations per patient	-0.68
Rural classification and average ASWPE per FTE	0.36
% oversupply (a) and consultations per FTE	0.62

The statistical features of the main variables for statistical subdivisions were:

	Mean	**Standard Dev.**	**Min.**	**Max.**
Co-payment (%)	10.97	7.19	0.12	45.7
Consultations per patient	5.46	0.91	3.19	8.26
ASWPE per FTE doctor	1141	199.8	510.9	1977.0

Various associations were graphed to ascertain whether there were points on a curve which might indicate where adequate supply became either oversupply or undersupply. Despite the trends overall in Table 4, the confounding influences of local factors such as socioeconomic status did not result in any clear lines of best fit.

An illustration of this is the relationship between level of co-payment and the Index of Socioeconomic Disadvantage for geographic areas.

Class of disadvantage	**Average level of co-payment (%)**
Most disadvantaged	4
Slightly disadvantaged	8
Slightly advantaged	10
Most advantaged	14
Total	**9**

This means that even in areas showing other indicators of high oversupply there appears to be a tendency to charge what the market will tolerate. In high socioeconomic areas, oversupply does not follow conventional economic theory in driving price down. An alternate view is that general practitioners who do not generally bulk bill do so for disadvantaged patients, and where there are higher concentrations of these, the average co-payment falls.

Establishing an appropriate workload for a general practitioner in a metropolitan area then becomes a matter of judgement. In Australian Doctor on 24 November 1995, Dr David Weedon, President of the AMA, posed the question,"How many consultations should a doctor do in a year?" and responded that it was a matter of how many hours one worked and how efficiently the work was done. He pointed out that in 1994 in general practice, 718 doctors provided more than 12,000 consultations, while the maximum was 31,452 for a vocationally registered doctor in a capital city. According to Dr Weedon, in the view of the Health Insurance Commission, (HIC) cases involving 15,000 consultations or more should be subject to review by the Commission.

The current recommendation of the Royal Australian College of General Practitioners (RACGP) is a provision of one GP per 1,500 population. As noted earlier, approximately 87.0% of the population are billed for at least one Medicare service in a given year. This equates to 1,305 of every 1,500 persons in the population being billed by Medicare, and an annual average GP consultation workload of 7,047 consultations, assuming the average for GP consultations in 1993-94 of 5.4. If one allows 4 weeks annual leave, one weeks sick leave and two weeks for continuing medical education (CME) as a desirable goal for each GP, this consultation workload equates to 156.6 consultations per week. This appears realistic, especially when it is considered that most GPs probably would not take this amount of leave, and the average male GP worked 47.8 hours in clinical care (54.8 hours total) in 1994 while the average female GP worked 31.6 hours in clinical care (36.1 hours total). The average for males and females was 41.1 hours clinical care and 49.6 total hours per week. 156.6 consultations per week therefore equates to an average of 3.8 consultations per hour, or 15.8 minutes per consultation, based on average clinical hours worked in 1994.

One member of the Working Group provided a case study to test assumptions in this area. The example was given of a country town (which will not be identified for confidentiality

reasons) which was well served with 11 general practitioners. Over the next couple of years, two practitioners left, and while the workload for the remaining individuals went up, it was still tolerable. This was not the case when a further two doctors departed. Each day, at the close of normal surgery hours, there would still be a waiting room of patients expecting to be seen.

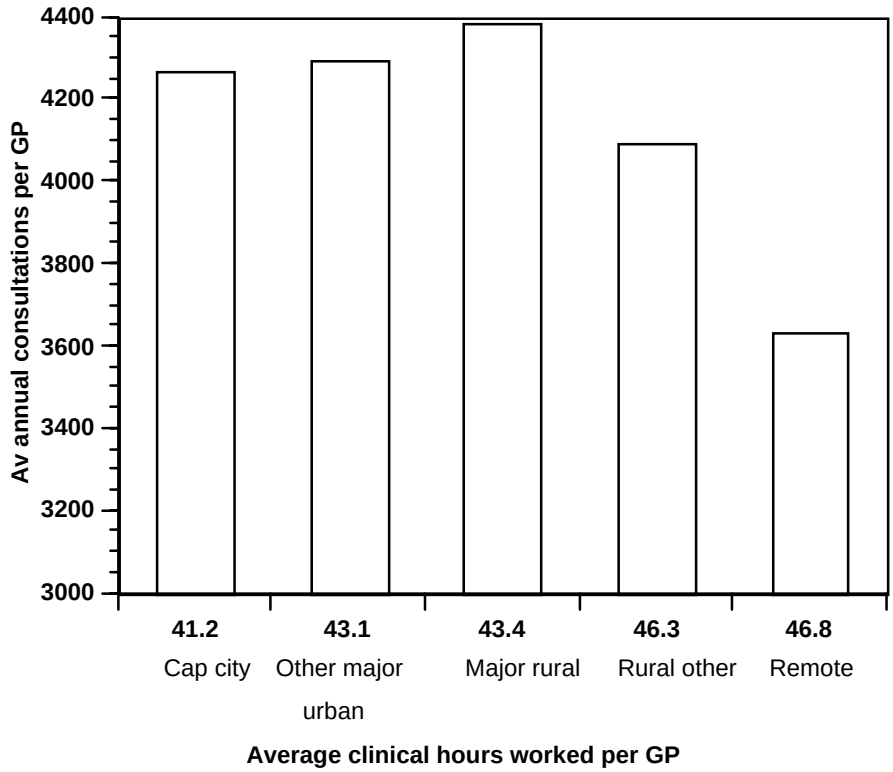
The particular country town in an inland rural area had a population which in 1994 equates to one doctor for every 1,502 persons in the town, although an additional outlying rural population in the catchment may increase the ratio to one is to 1,600 persons. Labour force survey responses indicate that eight of the nine doctors worked part-time and the FTE ratio was one is to 1,700. The full time doctors reported on average 53 hours of clinical care per week, a heavy workload. Medicare data shows an average co-payment of 19%.

In this example, 440 clinical care hours shared among 11 doctors for a DPR of one is to 1,390 was said to be comfortable, as the clinical care workload for the full time doctors would have averaged around 40 per week. When it rose to average 53 hours per week with nine doctors, for a DPR of one is to 1,700, it was hard work. With only seven doctors, and an average clinical load approaching 60 hours per week for the full-timers, with a DPR of one is to 2,200, it is easy to understand that it was considered that a crisis had arisen.

This example and the prior analysis of an average patient workload of 1,305 suggests that the RACGP recommended FTE DPR of 1:1,500 is reasonable. Assuming then that an ASWPE workload of 1,300 is what a full-time GP in a capital city or other major urban area (Wollongong, Gold Coast etc) should be able to undertake in a 12 month period, the next analysis step is to make any adjustments if necessary for other geographic classes.

Information from the 1994 Medicare and National Health Labour Force datasets was used to calculate the number of consultations per GP that could be undertaken in a 40 hour week of direct patient care.

Figure 1: Average annual consultations and average clinical hours worked per GP



This resulted in the following differentials which were then applied to a ASWPE standard of 1,300 for capital cities:

Geographic category	Differential	ASWPE
Capital cities	100.0	1,300
Other major urban	96.1	1,250
Rural major	97.5	1,268
Rural other	85.2	1,109
Remote	74.9	974

Other major urban centres have a population of 80,000 or more and include Newcastle, Wollongong, Geelong, Gold Coast, Cairns, Toowoomba and Launceston. In Table 4 there is very little difference between a capital city workload and that in other major urban areas. Consequently the capital city ASWPE workload of 1,300 has been used for other major urban areas. Major rural centres include the medium and large towns in Table 5, while Rural Other includes the small towns of this table. Remote areas are generally less densely populated and hundreds of kilometres from a major urban centre. The differentials for the three rural classes therefore are consistent with earlier data and the capital city ASWPE workload of 1,300 equated to 1,268 for rural major areas, 1,109 for rural minor, and 974 for remote.

In APPENDIX 1 the expected FTE general practitioner workforce for each SSD using these values is compared with the actual FTE workforce and the level of undersupply or oversupply calculated. Negatives values for shortfall represent oversupply; positive values represent shortages. Definitions used are included in the Appendix.

The tables in APPENDIX 1 show:

- overall, an FTE oversupply of 2,419 general practitioners and other medical practitioners (OMPs) providing general practice services;
- high levels of oversupply in all capital cities except Darwin;
- oversupply in large urban centres outside the State capitals;
- shortages in many rural areas distributed by State as follows:

NSW	163
VIC	83
QLD	102
SA	28
WA	41
Tasmania	16
NT	12
Total	**445**

This FTE total is on a par with a 500 total shortfall in general practitioners estimated by the Rural Doctors Association of Australia by a survey and consultation process.

The maldistribution of the workforce and overall oversupply of almost 2,500 FTE practitioners is summarised in Table 6.

Table 6: General practice workforce requirement, Australia, 1994

Geographic area	Total GPs + OMPS (b)	Estimated actual FTEs	Expected FTEs required	Shortage (a)	% shortage
AUSTRALIA	22,932	15,324.8	12,858.6	-2,466	-19.2
Capital cities					
SYDNEY	4,846	3,272.5	2,342.4	-930	-39.7
MELBOURNE	4,469	2,843.9	2,229.5	-614	-27.6
BRISBANE	1,964	1,270.7	930.5	-340	-36.6
ADELAIDE	1,623	1,139.4	802.3	-337	-42.0
PERTH	1,675	1,037.8	843.7	-194	-23.0
HOBART	328	198.1	143.3	-55	-38.2
DARWIN	131	54.5	47.4	-7	-14.8
CANBERRA	346	208.9	161.7	-47	-29.2
TOTAL	15,382	10,025.6	7,500.7	-2525	-33.7
Rest of State					
NSW	2,795	2,084.8	2,103.2	18	0.9
VIC	1,248	856.4	913.5	57	6.2
QLD	2,127	1,451.5	1,397.1	-54	-3.9
SA	421	313.3	315.9	3	0.8
WA	448	291.4	322.8	31	9.7
TASMANIA	307	218.0	209.8	-8	-3.9
NT	204	83.9	95.7	12	12.4
TOTAL	7,550	5,299.2	5,357.8	59	1.1
Total State					
NSW	7,641	5,357	4,446	-912	-20.5
VIC	5,717	3,700	3,143	-557	-17.7
QLD	4,091	2,722	2,328	-395	-17.0
SA	2,044	1,453	1,118	-335	-29.9
WA	2,123	1,329	1,166	-163	-13.9
TASMANIA	635	416	353	-63	-17.9
NT	335	138	143	5	3.3
TOTAL	22,586	15,116	12,697	-2,419	-19.1

Notes: (a) Negative shortage indicates oversupply; positive shortage undersupply.

(b) OMPS are medical practitioners providing general practice services other than vocationally registered GPs.

Source: AIHW

It should be emphasised that for individual SSDs there will be an error factor arising from the calculation of the FTE which evens itself out over the total database.

An alternate methodology for the GP workforce is discussed at the end of part 5.4. This also results in substantial metropolitan oversupply and rural undersupply.

5.3 The hospital non-specialist workforce

On 30th April 1993 the hospital non-specialist workforce was surveyed by the Medical workforce Working Group on Hospital Training and Career Development. Its September 1993 report 'Hospital Non-Specialist Medical Workforce Survey 1993' by Van Konkelenberg

and McAlindon included the following information on vacancies and use of temporary OTDs:

- of a total full-time workforce of 7,762, there was a vacancy rate of 5.1% and 4.7% of positions were filled by temporary OTDs;
- of a total part-time workforce of 939, 0.4% of positions were filled by temporary OTDs.

Information received from some State health authorities late in 1995 indicates that there had been little change in these figures since 1993, although there has been a significant increase in the workforce in NSW. Views were sought on to what extent the figures indicated shortages, but responses were generally not helpful.

Clearly a vacancy rate is an indicator of shortage but to some extent a minimum vacancy level of at least 2% represents healthy turnover. At certain times of the year this will be higher as intakes to general practice and other training programs recruit hospital non-specialist staff, or alternately hospital non-specialist staff complete hospital based training. Only the remainder of the rate, in this case, an estimated 3% or 230 positions represent a shortage.

Similarly, only some of the hospital non-specialist positions filled by temporary OTDs can be said to represent shortages. In NSW, the Postgraduate Medical Council directly allocates interns to hospitals and sets quotas for the recruitment of RMO1s. Only temporary OTDs recruited under “area of need” applications can be said to represent shortages and this information was not available for this study. Some States rely more heavily on “area of need” recruitment than others because of greater difficulty in filling positions in rural and remote areas.

For the purpose of this study, it is estimated that one third of the positions filled by temporary OTDs, or 130 positions, represent a shortage.

This gives an assumed estimate of a total shortage of 360 positions in the hospital non-specialist workforce. While it can be argued that this may be over-stating normal turnover, it has also been strongly argued that the work of hospital non-specialist staff should be re-designed to reduce hours and improve retention, and the present long hours being worked represent a shortage as much tradition.

In 1994 male hospital non-specialists worked on average 56.2 hours per week and females 53.2 hours, while male specialists-in-training worked on average 61.8 hours and females 55.8 hours. A reduction in hours to around 40 per week would require an increase in the workforce of the order of 15% or 1,160 persons. This may well be the challenge facing the hospital system early in the new century as reductions in medical school intakes necessitate a re-design of hospital medical work.

5.4 The specialist workforce

Past attempts to quantify shortages

There were two major attempts in 1994 to develop methodologies to quantify specialist workforce shortages. In February 1994 Dr John Paterson provided a paper to Health Ministers arguing an economic analysis model which showed that a number of medical specialties in apparent shortage had high growth rates in the level of co-payments but low growth in supply, while others with high growth in supply had low co-payment growth. The Working Group considered the Paterson approach but could not determine an acceptable methodology to enable it to be used as a mechanism for quantifying specialist

shortages, especially when the confounding influences noted in relation to the general practice workforce appeared to be just as evident for specialists, and there were a number of other confounding factors associated with co-payments which were suggested by rejoinder critics of the Paterson approach.

Also in 1994 Professor Peter Baume estimated a shortage of just over 500 persons in the surgical specialties in his report 'A Cutting Edge: Australia's Surgical Workforce". He consulted widely among the stakeholders to evaluate the evidence of undersupply or oversupply, and concluded that the 'global numbers are probably insufficient to meet reasonable demand. To this must be added considerable shortfalls in service provided (and possibly to numbers of surgeons available) in public hospitals.' Baume's empirical methodology was to analyse for each specialty surgeon-to-population ratios recommended by either the Royal Australian College of Surgeons or some other reputable source, and compare the recommended with actual provision.

The Working Group agreed with Professor Baume that shortages exist but did not accept his methodology as it was based on recommended DPRs which had not been validated. AMWAC has a long term work program to comprehensively assess individual specialties about which there is concern in relation to shortages, and use of this mechanism to validate DPRs for individual specialties was therefore not considered by the Working Group to be either appropriate or practical within the time-frame of this study. However in the longer term this is seen as offering the most valid methodology to establish specialist workforce benchmarks.

Late in 1994 AHMAC surveyed all State and Territory health authorities in preparation for a medical workforce workshop of AHMAC members in February 1995.

The AHMAC survey found shortages in the following specialties in the public system:

- urology
- orthopaedics
- ear, nose and throat
- ophthalmology
- anaesthetics
- psychiatry
- obstetrics and gynaecology
- emergency medicine
- radiology
- radiation oncology
- maxillo-facial / plastic surgery
- dermatology
- geriatrics
- rheumatology
- endocrinology
- allergy
- neurology
- cardiology

Unfortunately the submissions generally did not attempt to quantify the level of shortage. The Working Group repeated this survey in September 1995, asking each State health authority to quantify if possible both specialist and hospital non-specialist shortages. Responses indicated that the above list of specialties still covers those where there are shortages; however State health authorities do not have monitoring systems in place to quantify the shortages.

The NSW Health Department has the most comprehensive range of monitoring systems and provided the following information on medical specialties:

> A record of applications is kept for "area of need" immigration recruitment for rural NSW. Since January 1993 area of need applications have been approved for 3 radiologists, 2 emergency medicine specialists, 2 anaesthetists, 1 paediatric surgeon, 1 palliative care consultant, 1 gynaecologist and 1 cardiologist. In these cases all reasonable attempts to recruit within Australia have failed.
>
> The Department surveys shortages in specialists-in-training and in November 1994 found shortages of 13 basic trainees in general medicine, 8 in adult psychiatry, 7 in emergency medicine, 2 in general practice and obstetrics / gynaecology, and one each in child psychiatry, palliative care, paediatric medicine and other medicine. There were also advanced trainee shortages of 13 in adult psychiatry, 8 in emergency medicine, 3 in geriatric medicine and oncology, 2 each in gastroenterology, haematology, rehabilitation, and nuclear medicine, and one each in orthopaedic surgery, anaesthetics and a further 11 disciplines. A repeat of the survey in March 1995 had similar results.
>
> The Department does not currently monitor shortages of qualified specialists.

Waiting times for private practice office appointments

In 1994 Professor Peter Baume surveyed a sample of specialists from NSW, Victoria, Qld, South Australia and Western Australia selected at random by the DHSH, with each sample containing potentially 18 persons. His report was published in the Medical Journal of Australia (MOA) on 19 June 1995.

He concluded that "the average waiting time to see a specialist surgeon or physician for a non-urgent condition in private practice is acceptable by current community standards. However the longer waiting times suggest that there are too few urologists and female obstetricians and gynaecologists." No attempt was made to quantify the level of shortage in these two professions.

Baume excluded from his analysis a rural neurosurgeon whose waiting time was 138 days, a rural ophthalmic surgeon whose waiting time was 215 days and a female metropolitan obstetrician / gynaecologist who was taking no new patients. While this is an acceptable

research protocol to avoid artifically inflating averages, if the workforce problem is one of mal-distribution, then these cases are relevant.

The Working Group discussed the Baume methodology and recommended that a future survey of general practitioners include questions on waiting times for specialist services.

Waiting times for elective surgery in public hospitals

National surveys of elective surgery waiting lists in Australian public hospitals have been conducted in 1994 and 1995. The 1995 results will not be published until April 1996. The 1994 survey results indicated excessive clearance times and / or waiting times for the following surgical specialties:

- cardio-thoracic surgery;
- ear, nose and throat surgery;
- ophthalmology;
- orthopaedic surgery;
- plastic and reconstructive surgery;
- urology.

The Royal Australasian College of Surgeons, in an editorial in the MJA on 19 June 1995, said that "the causes of waiting lists are several, and a shortage of surgeons is certainly a possibility. Against this, however, are the recent examples of Victoria in 1993-94 and NSW 1994, where dramatic reductions in waiting lists occurred when incentive payment systems for hospitals were introduced. Hospital resources were used more efficiently and the surgical throughput increased dramatically without any increase in the surgical workforce."

This argument requires further analysis, especially as additional State health authorities introduce casemix funding.

Inter-state comparisons

One would expect a degree of equity in the provision of specialists relative to the demographic requirements of each State's population . In the following demographic table NSW and the Australian Capital Territory (ACT), and South Australia (SA) and the Northern Territory (NT) are combined, in recognition of the cross border flows of population and providers of specialist medical services. It can be seen that the most "aged" populations are SA+NT and Tasmania, while the "youngest" is Western Australia (WA). Consequently one would expect that SA+NT and Tasmania would have the highest provisions of specialists per 100,000 population, because of the greater need for specialist services by aged persons, and the provisions in SA+NT and Tasmania would be about the same given the age structure similarity. Similarly NSW and Victoria might be expected to about the same in provision given the near identical age structure, while WA would have the lowest.

Table 7: State and Territory demographic profiles, 30 June 1994

	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
Popn aged 65+	770,108	542,962	357,227	204,453	174,182	58,660	2,107,673
Popn aged 75+	304,665	217,139	142,110	81,917	69,161	23,626	838,655
Total popn	6,350,105	4,475,465	3,196,134	1,640,443	1,701,064	472,464	17,838,401
% aged 65+	12.1	12.1	11.2	12.5	10.2	12.4	11.8
% aged 75+	4.8	4.9	4.4	5.0	4.1	5.0	4.7

Source: ABS Demographic Statistics Cat. 3101.0

Table 8: Surgeons, 1993-94

Surgeons	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
				Number			
Specialists	1,302	902	568	360	282	81	3,495
Non-specialists	297	269	184	101	87	13	951
Total	1,599	1,171	752	461	369	94	4,446
% Specialist	81.4	77.0	75.5	78.1	76.4	86.2	78.6
				Number per 100,000 popn			
Total popn.:							
Specialists	20.50	20.15	17.77	21.95	16.58	17.14	19.59
Non-specialists	4.68	6.01	5.76	6.16	5.11	2.75	5.33
Total	25.18	26.16	23.53	28.10	21.69	19.90	24.92
Popn. aged 65+:							
Specialists	169.07	166.13	159.00	176.08	161.90	138.08	165.82
Non-specialists	38.57	49.54	51.51	49.40	49.95	22.16	45.12
Total	207.63	215.67	210.51	225.48	211.85	160.25	210.94
				Shortages (a)			
Total surgeons	**62**	**-**	**-**	**-**	**-**	**39**	**101**

Notes: (a) Assumes same provision for NSW+ACT as Victoria, and for Tasmania as SA+NT
Source: Medicare statistics, Department of Human Services and Health

The provision of surgeons per 100,000 population can be seen in Table 8, which provides prima facie evidence of a significant shortage in Tasmania. One would expect a provision of 28.1 per 100,000 population based on the provision in other States, and if this DPR is applied to the Tasmanian population it can be calculated that there is a shortage of 39 surgeons in Tasmania. One would also expect NSW provision to be on a par with Victoria. The estimated shortage in NSW is 62 surgeons. There do not appear to be significant inequities for the other States.

The same approach is used for the non-surgical specialist workforce in Table 9. In this case there appears to be an oversupply of 110 in NSW, and shortages of around 265 in Queensland, 37 in WA, and 63 in Tasmania.

Table 9: Non-surgical specialists, 1993-94

Practitioners	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
				Number			
Physicians	1,355	938	479	367	275	69	3,483
Obs & gynae	326	241	130	86	67	23	873
Dermatologists	113	63	36	19	19	5	255
Anaesthetists	658	499	310	190	180	52	1,889
Psychiatrists	539	490	224	180	89	36	1,558
Rad. oncologists	38	33	18	12	6	3	110
Pathologists SP	201	150	81	35	55	18	540
Other medical	907	424	279	171	174	36	1,991
TOTAL	4,137	2,838	1,557	1,060	865	242	10,699
				Number per 100,000 popn			
Physicians	21.34	20.96	14.99	22.37	16.17	14.60	19.53
Obs & gynae	5.13	5.38	4.07	5.24	3.94	4.87	4.89
Dermatologists	1.78	1.41	1.13	1.16	1.12	1.06	1.43
Anaesthetists	10.36	11.15	9.70	11.58	10.58	11.01	10.59
Psychiatrists	8.49	10.95	7.01	10.97	5.23	7.62	8.73
Rad. oncologists	0.60	0.74	0.56	0.73	0.35	0.63	0.62
Pathologists SP	3.17	3.35	2.53	2.13	3.23	3.81	3.03
Other medical	14.28	9.47	8.73	10.42	10.23	7.62	11.16
TOTAL	65.15	63.41	48.72	64.62	50.85	51.22	59.98
				Shortages (a)			
Non-surgeons	**-110**	**-**	**265**	**-**	**37**	**63**	**254**

Notes: (a) Assumes same provision for NSW+ACT as Victoria, for Tasmania as SA+NT, 57 per 100,000 popn for Qld and 53 per 100,000 popn for WA

Source: Medicare statistics, Department of Human Services and Health

Urban-rural within state comparisons

In 1994 the report on 'The Specialist Medical Workforce and Specialist Service Provision in Rural Areas' by D. Gadiel and L. Ridoutt found that, after standardising for age, persons living in rural and remote areas were receiving a much lower provision of specialist services than persons in capital cities and other major urban areas. Gadiel and Ridoutt analysed selected specialist services by State and geographic area, and then FTE provision of practitioners and an Index of Relative Endowment of FTE medical practitioners which quantifies the reduced service to persons in rural areas. These demonstrate the intra-State level of shortage in the provision of practitioners.

The Index of Relative Endowment State comparisons in Table 10 indicate significant shortages in Queensland, Western Australia and Tasmania, and oversupply in NSW compared to Victoria.

Table 10: Specialist supply and relative endowment*, 1992-93

Specialists	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
			Number of FTE practitioners				
Cap city	2,935	2,198	967	868	697	134	7,799
Other major urban	419	104	467	0	0	61	1,051
Rural	473	255	138	24	42	27	959
Remote	5	22	3	8	8	0	46
Total	3,832	2,579	1,575	900	747	221	9,854
			Index of relative endowment of FTE practitioners				
Cap city	130	122	125	134	103	125	124
Other major urban	107	122	135	0	0	0	120
Rural	57	42	27	12	24	29	40
Remote	12	64	5	11	9	0	15
Total	109	102	93	98	80	83	100

Notes: * Ratio of Australian total Medicare eligible population per FTE doctor to local population per FTE doctor by 100 (ie 100 = the standard).

Source: 'Specialist Medical Workforce and Service Provision in Rural Areas", D.Gadiel and L.Ridoutt, 1994

It must be remembered that this analysis takes into account age standardisation of the population, metroplitan specialists travelling to rural areas to provide out-reach services, and persons travelling to metropolitan areas to receive specialist services. What it does not take account of is substitution of specialist providers by GPs in rural and remote areas, and any additional provision of specialist services (in relative terms) to rural areas by the public hospital system which do not show up in Medicare data.

Ignoring these factors for a moment, if one was to theoretically create a level playing field for all Australians for provision of specialist services the following adjustments to the geographic distribution of specialists seen in Table 11 would occur, using the data in Table 10.

This indicates a re-distribution of about 1,700 FTEs from metropolitan areas to rural areas in the provision of services (either by residence in the rural area or through outreach services), with a reduction in services to the metroplitan population and an increase in services to the rural population.

Table 11: Change in specialist FTE distribution required if RE = 100 for all geographic areas

Specialists	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
Cap city	-677	-396	-193	-220	-20	-27	-1,534
Other major urban	-27	-19	-121	-	-	-	-167
Rural	357	352	373	176	133	66	1,457
Remote	37	12	57	65	81	-	252
Total	-311	-51	116	20	194	39	7

It can be argued alternately that rather than significantly reducing metropolitan services, the target level of provision of services should be based on a metropolitan benchmark, say Melbourne, which has an index of relative endowment of 122, lower than the Sydney (130), Brisbane (125), Adelaide / Darwin (134) and Hobart (125), with Perth (103) much lower and apparently under-provided.

Such an approach in Table 12 indicates an overall increase in the specialist workforce of 2,163 FTEs, with an increase in rural specialist workforce provision of 2,306.

Table 12: Change in specialist FTE distribution required if RE = 122 for all geographic areas

Specialists	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
Cap city	-181	0	-23	-78	129	-3	-156
Other major urban	59	0	-45	-	-	-	14
Rural	539	486	486	220	172	87	1,989
Remote	46	20	70	81	100	-	317
Total	463	506	488	223	401	83	2,163

However the analysis of the GP workforce showed that GPs in rural and remote areas are making a significant contribution to bridging some of this gap in the provision of specialist services. In Table 5 it can be seen that 16% of rural GP time is spent on providing non-GP Medical Benefits Schedule (MBS) services, double the 8% spent by metropolitan GPs. This additional effort by rural GPs to help bridge the shortfall in specialist services equates to about 220 GP FTEs using the GP numbers in Table 13. This suggests a reduction in the FTE shortage to 1,940 if a target relative endowment of 122 is used. In remote areas, nurse practitioners and Aboriginal health workers also provide substitute services. In practice travelling distances and access problems will always mean at least some reduction in demand for people in remote areas. Hence a target relative endowment is more likely to involve a greater reduction in capital city service provision and a lesser increase in rural areas, producing a net shortage of less than 1,000 FTEs.

This is an issue which needs further discussion but for the purpose of this exercise a conservative intra-state shortage of 900 FTEs is assumed.

Table 13: General practitioner supply and relative endowment*, 1992-93

GPs	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
			Number of FTE practitioners				
Cap city	3,978	2,743	1,276	1,048	957	161	10,163
Other major urban	525	108	674	0	0	76	1,383
Rural	1,066	700	591	234	184	99	2,874
Remote	49	36	44	51	53	13	246
Total	5,619	3,588	2,585	1,332	1,194	349	14,667
			Index of relative endowment of FTE practitioners				
Cap city	130	102	111	109	95	102	109
Other major urban	107	85	131	-	-	-	106
Rural	57	78	79	78	71	73	80
Remote	12	69	47	48	43	0	54
Total	109	96	103	97	86	88	100

Notes: * Ratio of Australian total Medicare eligible population per FTE doctor to local population per FTE doctor by 100 (ie 100 = the standard).

Source: 'Specialist Medical Workforce and Service Provision in Rural Areas", D.Gadiel and L.Ridoutt, 1994

Before leaving this methodology, the same approach can be used for GPs. Assuming considerable oversupply in the capital cities, and consultation rates in excess of population need, a desirable benchmark would need to be significantly less than 100. In Table 13, the relative endowment of 85 for Geelong (the 'other major urban' area in Victoria) suggests an urban area with supply and demand in approximate balance. Using this benchmark produces in Table 14 an overall oversupply of GPs of 1,700 FTEs.

Table 14: Change in GP FTE's required if RE = 85

Specialists	NSW+ACT	VIC	QLD	SA+NT	WA	TAS	TOTAL
Cap city	-1,377	-457	-299	-231	-101	-27	-2,491
Other major urban	-108	0	-237	-	-	-	-345
Rural	524	63	45	21	36	16	705
Remote	298	8	36	39	52	-	433
Total	-663	-386	-455	-170	-13	-11	-1,698

5.5 The locum workforce

> Despite our beliefs about ourselves and the expectations of our patients, no GP is a human night-and-day doctoring bank. All of us need our time off.....Night cover is recognised as an essential backup in health care. Unfortunately in general practice, finding daytime cover is becoming increasingly difficult. Much has been written about the plight in rural areas, where the shortages of locums are endemic. Little attention has been paid to the problems of the city. In the city it has been assumed that the urban oversupply of doctors will more than compensate for the leave requirements of most doctors. Vocational registration requirements and better practice grants have emphasised the GP's duty to provide appropriate care. What has not been recognised is that time-off requirements are usually endemic and seasonal.....Holidays are not the only time locums are needed. More often, GPs these days are finding activities that take them away from the surgery ..... study leave, college meetings and divisional activities ..... The traditional locum GP was usually a retired doctor, more likely to be a grandparent and therefore not as concerned with school holiday breaks. Given the ratio of males to females in the older age group of the GP workforce, they were more likely to be males ..... More recently, the locum situation has changed. There are now professional organisations involved in providing locum cover. Also, some younger doctors view the less regimented style of locum practice as appealing. Locums may be becoming a special group of practitioners in their own right. There is also a relatively unknown group of GPs that has been a steady supplier of locum services. It is not their main job, but rather a service they offer their colleagues. For some time, many academic GPs have offered their services to help colleagues obtain well-deserved breaks or to attend courses. In the world of academe, it is often difficult to juggle the daily commitments of general practice with the regular teaching sessions and ad hoc committee meetings..... Professor Deborah Saltman, associate professor of general practice at the University of Sydney, in Australian Doctor, 24 November 1995

This overview of the need for a locum workforce and the ways in which locum support may be provided illustrates the complexity of estimating locum workforce requirements. Factors appear to include:

- size of practice as solo practitioners will need locum support, but large group practices may make internal arrangements to cover absences. In Table 3, 22.6% of country practices and 29.3% of metropolitan practices consisted of solo GPs, while 43.7% of country practices and 20.4% of metropolitan practices had four or more GPs;
- full-time versus part-time employment, as full-time practitioners are more likely to need locum support than part-timers;

- vocational registration versus non-vocational registration as CME requirements for the former may require greater locum support.

A question on locum activity was included in the 1995 national labour force survey but data will not be available until mid-1996. Both Permail and the Australasian Medical Publishing Company collect statistics on practitioners who say that they are primarily locums, and both estimate around 300. In an FTE GP workforce of 15,000, theoretically one would need about 1,700 practitioners providing locum services to meet leave requirements if there was an even distribution of practice leave throughout the year and everyone needed about 6 weeks practice leave. However locums also assist in providing after hours and weekend coverage. National labour force statistics show that 3.8% of GPs work 1-10 hours per week and a further 9.3% work 11-20 hours per week. It can be deduced that many of these 1,500 are filling an after hours, weekend or de facto locum support role.

That there are shortages in the locum workforce is evidenced by the employment of temporary OTDs in locum services, and the anecdotal evidence of reports such as the preceding by Professor Saltman in alleging not only endemic shortages in rural areas but difficulty for urban practitioners, particularly in peak demand periods. More research and adequate data is needed to confidently estimate the shortage.

For the purposes of this exercise to enable a benchmark for the overall workforce to be estimated, it is assumed that

- the full-time locum workforce of 300 currently employed is not adequate;
- a 50% increase taken from the oversupply in the GP workforce should eliminate the need to employ temporary OTDs (assuming the additional locums are prepared to work wherever required in rural areas) and reduce the shortages for rural practitioners in particular. Approximately 170 locums are needed to service the one and two person GP practices in rural areas.

Locum services for specialists have not been considered because of lack of knowledge about arrangements made, other than that the public hospital system closes down large numbers of beds and reduces theatre time during the Christmas and Easter periods to accomodate specialist absences on leave, and private appointments are not taken during periods of leave.

6. PROJECTIONS OF CURRENT SUPPLY

The 1994 estimates of employed medical practitioners used in this report are:

total workforce 44,337 which equates to 40,317 FTEs; total practising clinicians 40,859, which equates to 37,300 FTEs.

These baselines have been projected to the year 2025 using 5 different scenarios:

Scenario 1 continued graduations from medical schools of 1200 p.a.; net additions to the workforce of 200 OTDs p.a.

Scenario 2 1200 medical school graduations p.a. to 2000, 1100 in 2001 and 1000 per year thereafter; net additions to the workforce of 200 OTDs p.a.

Scenario 3 continued graduations from medical schools of 1200 p.a.; net additions to the workforce of 300 OTDs p.a.

Scenario 4 1200 medical school graduations p.a. to 2000, 1100 in 2001 and 1000 per year thereafter; net additions to the workforce of 300 OTDs p.a.

Scenario 5 1200 medical school graduations p.a. to 2000, 1100 in 2001 and 1000 per year thereafter; net additions to the workforce of 200 OTDs p.a.; a gradual decline in hours worked by male doctors to 5 hours per week less in 2025; no change in hours worked by female doctors.

Of the five, scenario 5 reflects current national workforce policy and current trends in male hours worked. However, net annual intakes of OTDs from the Australian Medical Council (AMC) and migration from New Zealand currently are 300 or more, and Health Ministers wish to consider in April 1996 the impact of reducing medical school intakes. All of the projections embed changes in the age and sex structure of the medical workforce as older, mainly male cohorts retire and younger, more female cohorts age through the demographic structure.

The outcomes of the projections are shown in Tables 15, 16 and 17. The main features are:

- the 1995 Commonwealth policy to reduce medical school graduations from 1,200 to 1,000 per year is projected to result in about 4,500 fewer medical practitioners in 2025;
- the 1995 Commonwealth policy to impose a ceiling of a net annual increase in the workforce from OTDs of 200 is projected to result in about 3,000 fewer medical practitioners in 2025, assuming the net actual increase in recent years has been about 300 per year, including New Zealanders;
- the DPR for practising clinicians is projected to rise by 30% under the best case scenarios, and by 43% under the worst (scenario 3).

Table 15: Projections of total medical practitioners, current supply

Year	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	% female
1994	44,337	44,337	44,337	44,337	44,337	26.7
1995	45,661	45,661	45,661	45,661	45,661	27.2
2000	51,655	51,655	52,153	52,153	51,655	30.0
2005	57,472	56,772	58,461	57,760	56,772	32.2
2010	63,112	61,423	64,585	62,896	61,423	34.3
2015	68,566	65,901	70,515	67,852	65,901	36.1
2020	73,849	70,220	76,270	72,641	70,220	37.6
2025	78,983	74,400	81,863	77,280	74,400	38.9
% inc.						
1994-2025	78.1	67.8	84.6	74.3	67.8	
	Projected doctor to population ratios per 100,000 popn					
1994	248.5	248.5	248.5	248.5	248.5	
1995	253.4	253.4	253.4	253.4	253.4	
2000	272.2	272.2	274.8	274.8	272.2	
2005	288.6	285.1	293.5	290.0	285.1	
2010	303.6	295.5	310.7	302.6	295.5	
2015	317.4	305.1	326.4	314.1	305.1	
2020	330.0	313.8	340.8	324.6	313.8	
2025	341.9	322.0	354.3	334.5	322.0	
% inc.						
1994-2025	37.6	29.6	42.6	34.6	29.6	

Note: (a) ratio is number of medical practitioners per 100,000 population

Source: AIHW

The numbers of female practitioners are projected to increase much faster than those for males in each scenario. For example, in scenario 3, from 1994-2025, the numbers of females are projected to increase by 179%, the numbers of males by 52%. In scenario, females increase by 135%, males by 37%. This has a very significant effect on FTE numbers, seen in Table 14.

These projections do not take into account structural change in the health care system. An analysis of the impact of this on the USA system has been documented by Cooper (JAMA November 15 1995 ,Vol 274, No 19). The OECD data shows that in 1992 the USA had 227.6 FTE physicians per 100,000 population. However Cooper reported that in 1993 HMOs utilised 61 primary care physicians and 81 specialists per 100,000 enrollees, a total of 142 per 100,000. He projects that the proportion of the USA population in HMOs will increase from 10% in 1993 to 30% in 2000 to 40% in 2010 and 60% in 2020. The much higher HMO coverage of the population greatly reduces the expected future physician workforce requirement compared to lower HMO coverage.

Australian workforce requirements may change considerably during the next 30 years if both HMO and coordinated care fund holding arrangements are introduced. However it is too early to model how such changes to the Australian health care system might be implemented. Douglas (NCEPH, 1995) and Baulderstone (Australian Hospitals Association, 1995) have argued that general practitioners should be the care coordinators in an Australian model. However health consumers (Consumers Health Forum of Australia, 1995) want a range of coordinated care models piloted. It will be important that different models which are piloted include evaluation protocols for evaluating future workforce requirements.

Table 16: Projected total practising clinicians, current supply

Year	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
1994	40,859	40,859	40,859	40,859	40,859
1995	42,080	42,080	42,080	42,080	42,080
2000	47,603	47,603	48,061	48,061	47,603
2005	52,964	52,319	53,875	53,229	52,319
2010	58,161	56,605	59,518	57,962	56,605
2015	63,187	60,732	64,985	62,529	60,732
2020	68,056	64,712	70,287	66,942	64,712
2025	72,787	68,564	75,442	71,218	68,564
% inc.					
1994-2025	78.1	62.9	84.6	74.3	62.9
	Projected doctor to population ratios per 100,000 popn				
1994	229.0	229.0	229.0	229.0	229.0
1995	233.5	233.5	233.5	233.5	233.5
2000	250.9	250.9	253.3	253.3	250.9
2005	265.9	262.7	270.5	267.3	262.7
2010	279.8	272.3	286.3	278.9	272.3
2015	292.5	281.1	300.8	289.5	281.1
2020	304.1	289.2	314.1	299.1	289.2
2025	315.0	296.8	326.5	308.2	296.8
% inc.					
1994-2025	37.6	29.6	42.6	34.6	29.6

Source: AIHW

Table 17: Projected clinicians - full-time equivalents, current supply

Year	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
1994	37,300	37,300	37,300	37,300	37,300
1995	38,383	38,383	38,383	38,383	38,383
2000	43,244	43,244	43,653	43,653	43,083
2005	47,958	47,386	48,770	48,198	47,072
2010	52,504	51,128	53,713	52,337	50,647
2015	56,890	54,722	58,491	56,324	54,062
2020	61,135	58,184	63,122	60,171	57,333
2025	65,257	61,532	67,621	63,896	60,479
% inc.					
1994-2025	75.0	65.0	81.3	71.3	62.1
			Projected doctor to population ratios (a)		
1994	209.1	209.1	209.1	209.1	209.1
1995	213.0	213.0	213.0	213.0	213.0
2000	227.9	227.9	230.0	230.0	227.0
2005	240.8	237.9	244.9	242.0	236.3
2010	252.6	246.0	258.4	251.8	243.7
2015	263.4	253.3	270.8	260.7	250.3
2020	273.2	260.0	282.1	268.9	256.2
2025	282.4	266.3	292.7	276.6	261.8
% inc.					
1994-2025	35.1	27.4	40.0	32.3	25.2

Source: AIHW

10. PROJECTIONS OF BENCHMARK SUPPLY

Medical workforce benchmarks are dynamic. They should take into account the range of demand and supply influences discussed in Chapter 2.

Demand influences require annual increases in the benchmarks because of

- ageing of the population over and above population growth;
- growth in technology and the range of available drugs, and improvements in knowledge about medical care. These increase the range of medical treatments available, reduce the numbers of "untreatable" or "poorly treatable" conditions, and improve the level of precision of diagnoses for particular morbidity groups. Consumers "demand" the best care available within price constraints; medical practitioners "demand" the opportunity to provide that care to minimise the risk of mis-diagnosis, adverse outcome or legal redress;
- rising socio-economic status interacting with public health campaigns. These increase population coverage of persons taking personal responsibility for health through preventive actions such as screening, immunisation and check-ups. It can however be argued that these should be off-set by higher health status reducing the need to consult with medical practitioners about ill-health.

The number of Medicare services per head of population has been increasing for many years. For example, total services per capita increased from 7.2 in 1988/89 to 9.75 in 1992-93 and 10.43 in 1994-95. This annual growth includes the above elements together with factors for inappropriate and unnecessary care through supplier and consumer induced over-servicing which should be excluded from projections based on need.

Modelling the increased workforce requirement over time due solely to population growth and ageing of the population is easily done by applying Australian Bureau of Statistics (ABS) population forecasts to Medicare age by sex utilisation data:

- ABS series A/B projections for the period 1993 to 2041 have been used. These assume medium level fertility and low overseas migration. The population will increase from 18.04 million in 1995 to 23.24 million in 2026, an annual increase of 0.82% per year and 28.86% overall.
- 1994-95 Medicare age by sex utilisation data has been used as a benchmark. Although this may include some inappropriate servicing, it is assumed that this is uniformly distributed across the population, as per capita increases in utilisation have been occurring in all age-sex cohorts. If the same utilisation rate for each age-sex cohort is assumed to continue to 2026, the 188.1 million Medicare services in 1994-95 will increase to 269.8 million in 2026, an annual increase of 1.17% p.a. or 43.46% overall. In other words a 28.86% increase in population generates a 43.46% increase in utilisation because of the ageing of the population. The annual increase due to ageing alone is 1.17% - 0.82% = 0.35%.

The number of Medicare services processed grew by 4.3% in 1994-95, and by 4.7% in 1993-94 (1994-95 HIC Annual Report). Unreferred attendances increased by 2.0% in 1994-95 and 3.8% in 1993-94. Specialist attendances (excluding obstetrics, anaesthetics, pathology and diagnostics) increased by 4.0% in 1994-95 and 3.2% in 1993-94. Services for operations increased by 4.2% in 1994-95 and 0.3% in 1993-94. Comparisons with earlier years are affected by changes in the Medical Benefits Schedule.

The combined unreferred and specialist attendances and services for operations increased by 2.34% in 1994-95. The gap between actual growth and what might have been expected from population growth and ageing was therefore 2.34% less 1.17%, or 1.17%. As discussed earlier, this gap includes both genuine demand from new treatments etc available (which shall be called advances in medicine demand) and inappropriate servicing.

Demand scenarios can then derived as follows:

Scenario 1 Low increase in advances in medicine demand: 0.3% p.a. This gives a total demand increase of 1.47% p.a.

Scenario 2 Medium increase in advances in medicine demand: 0.6% p.a. This gives a total demand increase of 1.77% p.a.

Scenario 3 High increase in advances in medicine demand: 0.9% p.a. This gives a total demand increase of 2.07% p.a.

These compare to increases in Medicare providers of 2.7% in 1994-95, 2.8% in 1993-94, 2.2% in 1992-93, and 3.1% in 1991-92.

There is a 57.2% increase in workforce demand for Scenario 1, a 72.3% increase for Scenario 2 and an 88.7% increase for Scenario 3 (Table 18). The increases in the doctor to population ratios were 21.4%, 33.0% and 45.7% respectively.

Table 18: Benchmark supply projections based on demand scenarios

Scenario 1: 1.47%

	Total workforce				Clinicians			
Year	**Total**	**DPR**	**FTE**	**DPR**	**Total**	**DPR**	**FTE**	**DPR**
1994	42,931	240.6	39,616	218.8	39,453	221.1	36,599	205.1
1995	43,562	241.7	40,198	223.0	40,033	222.1	37,137	206.1
2000	46,859	246.9	43,241	227.9	43,063	226.9	39,948	210.5
2005	50,406	253.1	46,514	233.6	46,323	232.6	42,972	215.8
2010	54,222	260.9	50,035	240.7	49,829	239.7	46,224	222.4
2015	58,326	270.0	53,822	249.2	53,601	248.1	49,723	230.2
2020	62,741	280.4	57,896	258.7	57,658	257.7	53,487	239.0
2025	67,490	292.1	62,278	269.6	62,022	268.4	57,536	249.0
% incr.								
1994-2025	57.2	21.4	57.2	23.2	57.2	21.4	57.2	21.4

Scenario 2: growth 1.77%

	Total workforce				Clinicians			
Year	**Total**	**DPR**	**FTE**	**DPR**	**Total**	**DPR**	**FTE**	**DPR**
1994	42,931	240.6	39,616	218.8	39,453	221.1	36,599	205.1
1995	43,691	242.4	40,317	223.7	40,151	222.8	37,247	206.7
2000	47,697	251.4	44,014	231.9	43,833	231.0	40,662	214.3
2005	52,070	261.4	48,049	241.3	47,852	240.3	44,390	222.9
2010	56,844	273.5	52,455	252.4	52,239	251.3	48,460	233.1
2015	62,056	287.3	57,265	265.1	57,029	264.0	52,904	244.9
2020	67,746	302.7	62,515	279.4	62,258	278.2	57,754	258.1
2025	73,958	320.1	68,247	295.4	67,966	294.2	63,050	272.9
% incr.								
1994-2025	72.3	33.0	72.3	35.0	72.3	33.0	72.3	33.0

Scenario 3: growth 2.07% p.a.

	Total workforce		Clinicians	

Year	Total	DPR	FTE	DPR	Total	DPR	FTE	DPR
1994	42,931	240.6	39,616	218.8	39,453	221.1	36,599	205.1
1995	43,820	243.1	40,436	224.4	40,270	223.4	37,357	207.3
2000	48,547	255.8	44,798	236.1	44,614	235.1	41,386	218.1
2005	53,784	270.1	49,631	249.2	49,426	248.2	45,851	230.2
2010	59,586	286.7	54,985	264.5	54,758	263.4	50,797	244.4
2015	66,013	305.6	60,916	282.0	60,665	280.8	56,277	260.5
2020	73,134	326.8	67,487	301.6	67,210	300.3	62,348	278.6
2025	81,024	350.7	74,767	323.6	74,460	322.3	69,073	299.0
% incr.								
1994-2025	88.7	45.8	88.7	47.9	88.7	45.7	88.7	45.7

Source: AIHW

Comparisons between demand and supply

In Table 19, projections for workforce supply scenarios 1, 2 , 3 and 5 are compared with benchmark supply projections based on the low, medium and high demand projections, while workforce supply scenarios 3 and 5 are plotted in Figure 2 against the benchmark supply projections based on the three demand scenarios.

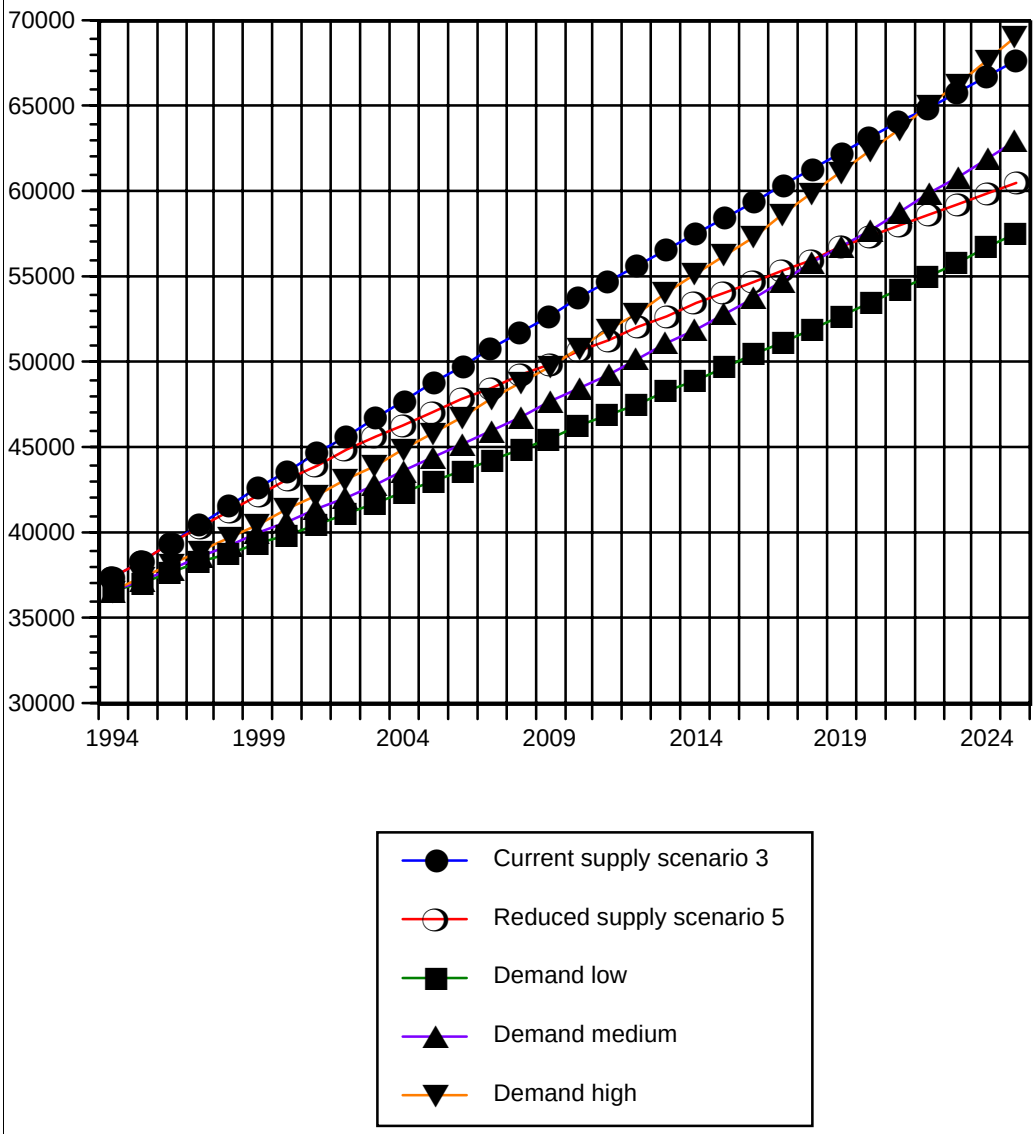
Table 19: Comparisons between supply growth and benchmark growth based on demand factors

	Supply Scenario 1	Supply Scenario 2	Supply Scenario 3	Supply Scenario 5	Benchmark Scenario 1	Benchmark Scenario 2	Benchmark Scenario 3
	200 OTDs	200 OTDs	300 OTDs	200 OTDs lower male hours			
Year	1200 grads	1000 grads	1200 grads	1000 grads	Low demand	Medium demand	High demand
				Total medical workforce			
1994	44,337	44,337	44,337	44,337	42,931	42,931	42,931
1995	45,661	45,661	45,661	45,661	43,562	43,691	43,820
2000	51,655	51,655	52,153	51,655	46,859	47,697	48,547
2005	57,472	56,772	58,461	56,772	50,406	52,070	53,784
2010	63,112	61,423	64,585	61,423	54,222	56,844	59,586
2015	68,566	65,901	70,516	65,901	58,326	62,056	66,013
2020	73,849	70,220	76,270	70,220	62,741	67,746	73,134
2025	78,983	74,400	81,863	74,400	67,490	73,958	81,024
% incr.							
1994-2025	78.1	67.8	84.6	67.8	57.2	72.3	88.7
				Total clinicians			
1994	40,859	40,859	40,859	40,859	39,453	39,453	39,453
1995	42,080	42,080	42,080	42,080	40,033	40,151	40,270
2000	47,603	47,603	48,061	47,603	43,063	43,833	44,614
2005	52,964	52,319	53,875	52,319	46,323	47,852	49,426
2010	58,161	56,605	59,518	56,605	49,829	52,239	54,758
2015	63,187	60,732	64,985	60,732	53,601	57,029	60,665
2020	68,056	64,712	70,287	64,712	57,658	62,258	67,210
2025	72,787	68,564	75,442	68,564	62,022	67,966	74,460
% incr.							
1994-2025	78.1	67.8	84.6	67.8	57.2	72.3	88.7

			FTE clinicians				
1994	37,300	37,300	37,300	37,300	36,599	36,599	36,599
1995	38,383	38,383	38,383	38,383	37,137	37,247	37,357
2000	43,244	43,244	43,653	43,083	39,948	40,662	41,386
2005	47,958	47,386	48,770	47,072	42,972	44,390	45,851
2010	52,504	51,128	53,713	50,647	46,224	48,460	50,797
2015	56,890	54,722	58,491	54,062	49,723	52,904	56,277
2020	61,135	58,184	63,122	57,333	53,487	57,754	62,348
2025	65,257	61,532	67,621	60,479	57,536	63,050	69,073
% incr.							
1994-2025	75.0	65.0	81.3	62.1	57.2	72.3	88.7

Source: AIHW

Figure 2: Supply and demand projections
FTE clinicians



Notes:

Supply scenario 3 assumes continuation of current workforce growth with net annual workforce additions of 300 OTDs and 1200 medical school graduates. Supply scenario 3 assumes reductions in medical school graduations to 1000 pa from 2002, net OTD additions of 200 pa, and a gradual decline in hours worked by male doctors.

The three demand projections are of benchmark supply according to the low, medium and high demand assumptions.

Source: AIHW

The differences between projected supply based on scenario 5 and projected benchmark requirements based on medium growth in demand are:

Table 20: Projections of scenario 5 supply growth in excess of benchmark supply growth

Year	Percentage in excess of benchmark supply
1995	3.0
2000	6.0
2005	6.0
2010	4.5
2015	2.2
2020	-0.7
2025	-4.1

Source: AIHW

This indicates continued workforce growth in excess of benchmark requirements for the next 10 years after which a convergence is expected to occur between supply and benchmark requirements as a result of fewer medical graduates entering the workforce.

This study has not, in the time available, been able to separately project supply of general practitioners, specialists and other groups in the workforce. Ideally one would wish to model each workforce sub-group under various scenarios to measure the effects of changes in the numbers of additions to the workforce, changes in role, impact of feminisation and so on.

What this study has shown conclusively is that the most serious workforce problem is mal-distribution, and that if this is not addressed effectively, steps to reduce workforce growth may exacerbate mal-distribution problems.

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