

Australian Medical Workforce Advisory Committee

THE ANAESTHETIC WORKFORCE IN AUSTRALIA

SUPPLY, REQUIREMENTS AND PROJECTIONS

1995 - 2006

AMWAC Report 1996.3

January 1996

© Australian Medical Workforce Advisory Committee 1996

ISBN 0 7310 0762 X

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without the prior written permission of the Australian Medical Workforce Advisory Committee.

Copies of this report and inquiries concerning reproduction should be directed to:
Australian Medical Workforce Advisory Committee
Locked Mail Bag 961
New South Wales Department of Health
NORTH SYDNEY NSW 2059

Publication and design by Australian Medical Workforce Advisory Committee

Cover design and printing by Copybook

CONTENTS

Abbreviations	v
List of Tables and List of Figures	vi
Terms of Reference of AMWAC and the Anaesthetic Workforce Working Party	vii
Membership of the AMWAC Anaesthetic Workforce Working Party	viii
Introduction, Guiding Principles and Methodology	1
Summary of Findings and Recommendations	4
Description of the Current Anaesthetic Workforce	7
The Number of Practising Specialist Anaesthetists in Australia	7
Growth in the Specialist Anaesthetic Workforce	8
Distribution of the Specialist Anaesthetic Workforce	9
Age Profile	9
Gender Profile	11
Participation Rate	12
Services Provided and Performed	13
Training Arrangements	17
Adequacy of the Current Anaesthetic Workforce	20
Anaesthetist:Population Ratios	20
Public Hospital Vacancy Rate	22
Elective Surgery Waiting Lists and Waiting Times	24
Anaesthetists Opinions	25
Projections of Requirements	26
Population	26
Changes in Utilisation	26
Changes in Technology and Options for Service Provision	27
Projections of Supply	30
Changes in Supply	30
Women in the Workforce	30
Provision of Services in Rural and Remote Areas	30

Balancing Supply Against Requirements	31
Requirements Trends	31
Supply Trends	31
Projected Balance	32
Recommendations	36
Appendix	37
References	38

Abbreviations

ABS	Australian Bureau of Statistics
AHMAC	Australian Health Ministers' Advisory Council
AIHW	Australian Institute of Health and Welfare
AMWAC	Australian Medical Workforce Advisory Committee
ANZCA	Australian and New Zealand College of Anaesthetists
APR	Anaesthetist:Population Ratio
ASA	Australian Society of Anaesthetists
DHSH	Department of Human Services and Health (Commonwealth)
FTE	Full Time Equivalent
GP	General Practitioner
MWDRC	Medical Workforce Data Review Committee
MWSAC	Medical Workforce Standing Advisory Committee (United Kingdom)
RACGP	Royal Australian College of General Practitioners
RACS	Royal Australasian College of Surgeons
RARA	Rural and Remote Areas
TRD	Temporary Resident Overseas Trained Doctor
VMO	Visiting Medical Officer

List of Tables

- 1 ANZCA Australian members and Medicare specialist anaesthetists; by year 1984-85 to 1994-95
- 2 Specialist anaesthetists; by State/Territory, 1984-85 and 1994-95
- 3 Distribution of specialist anaesthetists; by State/Territory and geographic location, 1994-95
- 4 Age profile of ANZCA non retired Australian members; by State/Territory and gender, 1995
- 5 Age profile of ANZCA non retired Australian members; by State/Territory and age category, 1995
- 6 Estimated hours worked per week by specialist anaesthetists; by age category, 1992-93
- 7 Average hours worked per week by specialist anaesthetists; by State/Territory, 1992-1993
- 8 Specialist anaesthetists; by number of Medicare services provided, 1994-95
- 9 Specialist anaesthetists; by Medicare services provided, fees charged and benefits paid, 1990-91 and 1994-95
- 10 Operating room procedures; by State/Territory and by public/private, 1991-92 and 1993-94
- 11 Hospital separations with a principal diagnosis indicating anaesthesia; by age group, 1992-93
- 12 Anaesthetic services, age standardised; by RARA classification, 1992-93
- 13 Anaesthetic training posts; by State and year, 1984 to 1995
- 14 Specialist anaesthetists in training; by State/Territory and gender, 1995
- 15 Specialist anaesthetist:population ratio; by year, 1984-85 to 1994-95
- 16 Specialist anaesthetist:population ratio; by State/Territory, 1984-85 and 1994-95
- 17 Specialist anaesthetists index of relative endowment; by State/Territory, 1992-93
- 18 Public hospital anaesthetic positions and vacancies; by State/Territory, 1995
- 19 Public hospital intensive care anaesthetists positions and vacancies; by State/Territory, 1995
- 20 Projected increase in hospital separations with a principal diagnosis indicating anaesthesia; by age category, 1993 and 2016
- 21 Projected requirements for anaesthetic services; by hours worked per week, 1995 to 2006
- 22 Projected supply of anaesthetic services; by hours worked per week, 1995 to 2006
- 23 Anaesthetic graduate output required to balance projected supply with projected requirements (2.4% growth in activity); by hours worked per week, 1995 to 2006
- 24 Anaesthetic graduate output required to balance projected supply with projected requirements (3.4% growth in activity); by hours worked per week, 1995 to 2006
- 25 Additional anaesthetic training posts; by State/Territory, 1997 and 2006

List of Figures

- 1 Fellows admitted to ANZCA; by gender and year 1984 to 1995
- 2 Projected anaesthetic requirements and supply, 1995 to 2006
- 3 Elimination of the potential shortfall - projected anaesthetic supply and requirements, 1995 to 2006

Terms of Reference of AMWAC and the Anaesthetic Workforce Working Party

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.

Anaesthetic Workforce Working Party Terms of Reference

The Anaesthetic Workforce Working Party was established as a sub-committee of AMWAC and was asked to provide a report to AMWAC on the optimal supply and appropriate distribution of anaesthetists across Australia, including projections for future requirements.

The Working Party held its first meeting on 27 July 1995 and presented its report to the AMWAC meeting of 30 January 1996.

Membership of the AMWAC Anaesthetic Workforce Working Party

Chairman

Dr David Theile former President
Royal Australasian College of Surgeons

Members

Assoc Prof Neville Davis President
Australian and New Zealand College of Anaesthetists

Dr David Filby Executive Director
Policy and Planning
South Australian Health Commission

Dr Mark Waters Director of Medical Services
Ipswich Hospital, Queensland

Dr Greg Wotherspoon President
Australian Society of Anaesthetists

Ms Joan Dowling Policy Officer
AMWAC

The Working Party would also like to acknowledge the helpful comments provided by Professor John Horvath and Mr Paul Gavel (AMWAC) and those professional bodies and organisations who provided responses to our request for views; Dr Ron van Konkelenberg for assistance with the projection analysis; and Mrs Joan Sheales and Dr Moira Westmore (ANZCA); Mr Ross Saunders and Ms Joan Longeran (DHS); and Mr John Harding and Ms Anne Broadbent (AIHW) for assistance with data collection.

INTRODUCTION, GUIDING PRINCIPLES AND METHODOLOGY

Introduction

In preparing this report the Working Party's aim has been to promote appropriate anaesthetic services across Australia.

The main objective of the Working Party has been to promote an optimal supply and appropriate distribution of anaesthetists, including projections for future requirements to the year 2006.

Guiding Principles

In compiling this report, the Working Party adopted the following guiding principles:

- the Australian community should have available an adequate number of trained anaesthetists, appropriately distributed to provide the anaesthetic services it requires;
- the community is best served when anaesthetists have high standards of qualification and work with a high level of ongoing experience;
- standards of practice will be highest if anaesthetists perform a reasonable volume of work;
- the best assurance of standards is a high quality requirement for entry to practice;
- all Australian citizens must have access to a good standard of anaesthetic care irrespective of geography and economic status. In achieving this, convenience to the patient must be balanced against the quality of services that can be distributed to meet that convenience;
- both public and private sectors must provide an adequate amount and quality of service; and
- anaesthetic services are dependent on surgical services and other medical services that require anaesthesia.

The Working Party defined a specialist anaesthetist as a medical practitioner who is practising anaesthesia and is on the specialist register.

Methodology

The approach of the Working Party has been to analyse existing data sources and to undertake consultation with relevant persons and organisations. In order to make informed comments on the factors affecting the current and future market for anaesthetic services, submissions were sought from the organisations listed in the Appendix.

In estimating workforce numbers, establishing a profile of the workforce and assessing its adequacy the main sources of data were:

1. Australian and New Zealand College of Anaesthetists (ANZCA)

ANZCA keeps a variety of data, principally on number of Fellows, training posts, and age and gender information. The major deficiency with ANZCA data is that not all specialists are Fellows of the College.

2. Australian Society of Anaesthetists (ASA)

ASA is another useful source of data on current numbers of anaesthetists, including specialists who are not members of ANZCA and non specialists who perform some anaesthesia as part of general practice.

3. Australian Institute of Health and Welfare (AIHW)

The principal AIHW data source is the annual Health Labour Force Survey. The Health Labour Force Survey presents national labour force statistics for registered medical practitioners, principally through a survey collected as part of the annual renewal of registration. The survey data used in this report is for 1992-93. This survey had an 88.5% overall response rate.

4. Department of Human Services and Health (DHS) Medicare provider database

Medicare provider statistics define medical practitioners according to the predominant services billed to Medicare. The Medicare statistics include all practitioners who have billed Medicare for at least one service during a financial year.

The major deficiency with the use of Medicare data for workforce planning purposes is that data are not available on practitioners who are full time salaried anaesthetists in the hospital system and who do not render services on a fee for service basis. So Medicare data does not include services rendered free of charge to public hospital patients and to Veterans' Affairs patients and compensation cases.

It should also be noted that Medicare statistics define providers according to the predominant service billed to Medicare. For example, a general practitioner who performs anaesthesia but whose services billed to Medicare are mainly in general practice would be classified as a general practitioner. This complicates any estimate of the number of non specialist anaesthetists and their activity.

Wherever possible, distributional data has been interpreted using the rural and remote area classifications developed by the Commonwealth Department of Human Services and Health (DHS 1994).

5. AMWAC Public Hospital Specialist Vacancy Survey

AMWAC surveyed Australian public hospitals in July 1995, seeking information on specialist vacancies in anaesthetics, ophthalmology, orthopaedics and urology. The survey sought information on visiting medical officer (VMO) and staff specialist vacancies and vacancies filled by temporary resident overseas trained doctors (TRD). The survey had a 98.8% response rate, with all large metropolitan and rural hospitals responding.

6. Other data sources

Two private companies, the Australasian Medical Publishing Company and Permail, collect details on the size and profile of specialist workforces; however the Working Party decided not to use this data as neither source offers complete coverage of the medical workforce and would provide no better picture of the anaesthetic workforce than the ANZCA, DSHS and AIHW data.

The Working Party used Australian Bureau of Statistics (ABS) population data and projections as the sole source on population data. In making its population projections ABS uses four different series. The population projections in this report are based on Series A/B, where constant fertility and low overseas migration are assumed (ABS 1994).

Key Assumptions

The lack of adequate data on non specialist anaesthetists and general practitioners (GPs) who provide some anaesthetic services left the Working Party with an incomplete appraisal of the practising anaesthetic workforce. Some information is available through the Medicare statistics about those GPs who earn more than 50% of their income from anaesthesia but no information is available about the more occasional anaesthetists. As a result, the Working Party decided to restrict its quantitative analysis to the specialist anaesthetic workforce.

In doing so, the Working Party recognises that there will be a continued role for GPs in providing anaesthetic services, particularly in rural and remote areas. Accordingly, more work needs to be undertaken in an effort to understand this section of the workforce.

In 1994-95 139 non specialist practitioners/GPs earned more than 50% of their income from anaesthesia; which represented 7% of total Medicare identified anaesthetic services. Anecdotally, it has been suggested that the non specialist section of the workforce comprises approximately 1,000 practitioners and represents about 10% of activity. There is also, some suggestion that this could be a contracting sector of supply. As part of its work plan in 1996, AMWAC will examine strategies to obtain data on the size and practice patterns of this section of the workforce.

The Working Party would also like to emphasise that the projections on supply and requirements are based on the assumption that there will be no significant change in existing national health structures.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Description of the Current Anaesthetic Workforce

The estimated current size of the specialist anaesthetic workforce is 1,948.

New South Wales has the most specialist anaesthetists, 585 (33.3%), followed by Victoria, 459 (26.1%), Queensland with 285 (16.2%). Northern Territory has the lowest number with just 10 (0.6%) specialist anaesthetists.

Medicare data shows that since 1984-85 the specialist anaesthetic workforce has grown by 48.8% (increasing from 1,219 in 1984-85 to 1,814 in 1994-95).

77.6% specialist anaesthetists are located in a capital city (63.5% of population), 10.1% of specialist anaesthetists are located in other major urban areas (8.2% of population) and 12.3% of specialist anaesthetists are located in rural and remote areas (28.3% of population).

The modal age range of ANZCA members is 40 to 49 years (649 Fellows) followed by the 30 to 39 year age group with 454 Fellows. 15% are aged over 60 and 23.1% are in the 50 to 59 year age group.

There are 304 female ANZCA members, representing 17% of the workforce. Currently there are 110 female anaesthetic registrars in training, representing 25.9% of trainees.

At present there are 369 approved training posts throughout Australia.

The AIHW survey indicates that the majority of specialist anaesthetists work between 41 and 50 hours per week (50.4%).

79.7% of specialist anaesthetists work over 40 hours per week; specialist anaesthetists work more than 40 hours per week on average between the ages of 35 and 60 years of age, with a major decline in average hours per week from sixty years onwards. The modal age range (the age range where the greatest number of hours was worked was 45 to 59 years)

The ANZCA survey indicated that 54% of the female Fellows worked over 40 hours per week.

In 1994-95 57.5% of specialist anaesthetists provided more than 1,000 Medicare services.

The average number of Medicare services per specialist anaesthetist increased by 4.1%, from 1,426 services in 1990-91 to 1,485 in 1994-95.

The number of anaesthesia services provided through Medicare increased by 14.7% between 1990-91 and 1994-95.

Adequacy of the Current Anaesthetic Workforce

The specialist anaesthetist:population ratio is estimated at 1:9,252 (based on the estimated workforce of 1,948).

The public hospital vacancy rate in 1995 for staff specialists was 14.2% (61 FTE vacant positions) and for VMO anaesthetists was 2.3% (14.5 FTE vacant positions).

The public hospital vacancy rate in 1995 for intensivists was 22.2% for staff specialists (22.4 FTE vacant positions) and 12% for VMO intensivists (1.2 FTE vacant positions).

Geographically, the vacancies were greatest in New South Wales (Greater Western Sydney and the Illawarra) and Queensland (both in Brisbane and major rural centres).

TRDs were filling a further 16 vacant positions (the majority of the TRDs were working in Greater Western Sydney and Perth).

Projections of Requirements and Supply

Annual loss from the anaesthetic workforce is estimated to be 40 specialists.

It is expected that an average of 80 new specialists will enter the workforce up to 2000 (ranging from 76 in 1995 to 84 in 1999) and that 92 will enter the workforce in 2000.

Minimum annual growth in requirements will be 1.4% (population growth and ageing).

A precise growth in activity was difficult to determine and two scenarios, annual growth in requirements of 2.4% and 3.4% (the current trend in activity), were developed.

It is unlikely that the current level of graduate output will be sufficient to balance future requirements and that an increase in graduate output from the current projected level of 92 per year in 2000 to between 122 to 172 per year by 2005 may be necessary.

In making its recommendations the Working Party adopted the annual growth in requirements projection of 2.4%, which produces a graduate output target of 122 by 2005.

Recommendations

The Working Party recommends:

1. There be an increase in the number of funded anaesthetic training positions and trainees to match an expected future growth in activity of 2.4% per year.
2. That State health departments undertake immediate negotiations with ANZCA for the establishment of additional training positions, initially up to a maximum of 28 in 1997, distributed as shown in the following table:

State/Territory	1995	1997	2006	Increase 1995 to 1997	Increase 1995 to 2006
NSW/ACT	119	130	170	11	51
Victoria	99	105	120	6	21
Queensland	61	67	91	6	30
SA/NT	46	47	49	1	3
West Australia	35	38	47	3	12
Tasmania	9	10	12	1	3
AUSTRALIA	369	397	489	28	120

3. In recognition that this measure will not provide an effective contribution to the anaesthetic workforce until 2001, State based anaesthetic services working groups, comprising ANZCA and State department of health representatives, be established to address what short term local measures need to be adopted to meet any shortfall.
4. Options for consideration by the anaesthetic services working groups include local incentives to increase the current work load of specialist anaesthetists; use of appropriately qualified and skilled overseas trained anaesthetists; and increased skilling and use of general practitioners, particularly in rural areas.
5. That AMWAC co-ordinate a more definitive analysis of anaesthetic stakeholders views in order to further refine the anticipated trend in activity growth.
6. That anaesthetic requirements and supply projections be monitored annually so that they can be amended if new trends emerge.
7. That this monitoring be co-ordinated by the ANZCA and AMWAC and the results incorporated into AMWACs annual report to AHMAC. AMWAC will provide any necessary support.
8. AMWAC examine strategies to obtain data on the size and practice patterns of general practitioners who provide anaesthetic services.

DESCRIPTION OF THE CURRENT ANAESTHETIC WORKFORCE

As discussed in the Introduction, there are a variety of data sources on the numbers, attributes and distribution of specialist anaesthetists in Australia. While each of these data collections has some deficiency, it is possible to piece together a reasonably accurate and up-to-date profile of the workforce.

In establishing the profile of the current specialist anaesthetic workforce, the Working Party examined:

- Medicare data for specialist anaesthetists;
- ANZCA data on its Fellows and training arrangements;
- the distribution of specialist anaesthetists;
- age and gender profiles of the workforce;
- the participation rate; and
- the services performed and provided by specialist anaesthetists.

The Number of Practising Specialist Anaesthetists in Australia

In 1995 ANZCA had 1,788 non retired Australian members. The ASA had 1,464 practising members, of whom 1,289 were also Fellows of ANZCA; the remaining 175 members comprised specialists who were not a Fellow of ANZCA and GPs providing anaesthesia.

Medicare data for 1994-95 identifies 1,953 practising anaesthetists, comprising 1,756 specialists, 58 intensive care anaesthetists and 139 non specialist anaesthetists.

The 1992-93 AIHW survey showed 1,753 practising specialist anaesthetists. By way of comparison, Medicare data for 1992-93 showed 1,712 specialists and there were 1,668 ANZCA Fellows.

To establish the current number of practising specialist anaesthetists the Working Party carried out a reconciliation process and estimated that current number of practising specialists is 1,948. The figure is based on the number of ANZCA Fellows (1,788) plus an estimate of the number of specialist who are not Fellows of ANZCA (160).

Table 1: ANZCA Australian members and Medicare specialist anaesthetists; by year, 1984-85 to 1994-95

Year	ANZCA members	Medicare specialists
1984-85		1,219
1985-86		1,277
1986-87		1,369
1987-88		1,423
1988-89		1,495
1989-90		1,537
1990-91		1,594
1991-92		1,656
1992-93	1,668	1,712
1993-94	1,719	1,787
1994-95	1,788	1,814

Source: ANZCA and DSHS

Growth in the Specialist Anaesthetic Workforce

Tables 1 and 2 show the growth in the anaesthetic workforce since 1984. Medicare data shows a 595 or 48.8% growth in the workforce. Population growth during this same period was 14.2%.

Table 2: Specialist anaesthetists; by State /Territory, 1984-85 and 1994-95

Year	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	AUST.
1984-85	451	311	136	137	114	29	20	7	1,219
1994-95	602	469	291	188	173	49	32	10	1,814
% increase	33.5	50.8	114.0	37.2	51.8	69.0	60.0	42.9	48.8
Popn increase	11.8	9.2	26.6	7.6	21.4	8.0	22.9	17.2	14.2

Source: DSHS and ABS

Distribution of the Specialist Anaesthetic Workforce

Table 3 (using Medicare data) shows the current distribution of anaesthetists between States and Territories and by geographic location. Overall, 77.6% (63.5% of population) of anaesthetists had their primary residence in a capital city, 10.1% (8.2% of population) in other major urban areas and the remaining 12.3% (28.3% of population) in rural areas.

This distribution varied considerably between States and Territories with Tasmania and Queensland having a much lower proportion of anaesthetists in capital cities and a higher proportion in other urban areas. This is not surprising given the population distribution in these States.

The proportion of anaesthetists with their primary location in a rural area varies considerably between States and Territories, ranging from 3.98% in South Australia to 30% in the Northern Territory. The other significant factor is that whilst rural and remote areas comprise 28.3% of population only 12.3% of anaesthetists are located in a rural or remote area.

Table 3: Distribution of specialist anaesthetists; by State/Territory and geographic location, 1994-95

	Number	% of Australia	% capital city	% other major urban	% rural
NSW	585	33.32	73.7	9.4	16.9
Victoria	459	26.14	82.8	4.3	12.9
Queensland	285	16.23	58.3	30.5	11.2
South Australia	176	10.02	96	-	4
West. Australia	162	9.22	95.1	-	4.9
Tasmania	48	2.73	52.1	33.3	14.6
ACT	31	1.76	98	-	2
NT	10	0.57	70	-	30
AUSTRALIA	1756	100.0	77.6	10.1	12.3

Source: DSHS

Gadiel and Ridoutt in their 1994 work on the specialist services in rural areas concluded that 9.5% (in 1992-93, full time equivalents) of the specialist anaesthetic workforce was located in rural areas (Gadiel and Ridoutt 1994).

Age Profile

Table 4 provides information on the age distribution of the active Fellows of ANZCA. It shows that the youngest age of a Fellow was less than 30 years of age. There were 71 Fellows over the age of 70. The largest ten year age group was the 40-49 year age

group with 649 Fellows, followed by the 30-39 year age group with 454 Fellows.

Table 5 provides a summary of the ANZCA age data by major categories. It shows that for Australia, 61.8% of Fellows are aged under 50 years and 15% are aged over 60 years. Significantly, 23.1% of Fellows are aged 50-59 years, indicating there will be a sizeable number of specialists leaving the workforce after 2000.

This trend is fairly consistent across States and Territories. For Fellows aged under 50 years the range is from 46.7% of Fellows in the Australian Capital Territory to 66.2% in Queensland, and for Fellows aged 50-59 years range is from 18.4% in Victoria to 33.3% in the Australian Capital Territory.

Table 4: Age profile of ANZCA non retired Australian members; by State/Territory and gender, 1995

State/Terr	Gender	<30	30-39	40-49	50-59	60-69	70+	Total
NSW	Male	1	112	177	133	66	19	508
	Female	0	33	41	15	7	3	99
Victoria	Male	1	96	138	67	47	18	367
	Female	0	35	26	17	9	3	90
Qld	Male	0	53	91	62	14	3	223
	Female	0	23	21	7	7	3	61
SA	Male	0	43	49	55	21	10	178
	Female	0	8	11	5	1	0	25
WA	Male	0	29	65	28	13	5	140
	Female	0	4	4	5	3	1	17
Tasmania	Male	0	7	14	10	4	4	39
	Female	0	3	0	0	1	1	5
ACT	Male	0	5	5	9	4	1	24
	Female	0	2	2	1	1	0	6
NT	Male	0	1	4	0	0	0	5
	Female	0	0	1	0	0	0	1
Australia	Male	2	346	543	364	169	60	1484
	Female	0	108	106	50	29	11	304
	Total	2	454	649	414	198	71	1788
%	Total	0.1	25.4	36.3	23.2	11.1	4.0	100
%	Female	0	23.8	16.3	12.1	14.6	15.5	17.0

Source: ANZCA

Table 5: Age profile of ANZCA non retired Australian members; by State/Territory and age

category, 1995

	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	Aust.
% under 50 yrs	59.96	64.77	66.19	54.68	64.50	54.55	46.67	100	61.80
%50-59 yrs	24.39	18.38	24.30	29.56	21.49	22.72	33.33	-	23.16
% over 60 yrs	15.65	16.85	9.51	15.76	14.01	22.73	20.00	-	15.04

Source: ANZCA

Gender Profile

Table 4 also provides information on the gender profile of the ANZCA membership. Currently 304 of the ANZCA Fellows are female, making up 17% of the membership.

On a State basis the percentage of female members ranges from 27%, 25% and 24.5% of the membership in the Australian Capital Territory, Queensland and Victoria respectively to 12% in Western Australia. The figure for New South Wales is 19.5% of the membership. More significantly perhaps, women represent 24% of the membership aged under 50 years.

Historically, the proportion of female ANZCA Fellows has remained fairly stable over the last 10 years. From 1984 to 1994, the percentage of Fellows admitted to ANZCA that were female remained fairly constant at around 18-20%. This has increased to 25% in 1995 (see figure 1).

**Figure 1: Fellows admitted to ANZCA; by gender and year, 1984 to 1995
Participation Rate**

The level of active supply is affected by the participation rate of practitioners, in terms of their full time and part time status. Anaesthetists working different hours can be converted to a standard estimate of productivity defined as full time equivalent (FTE), ie determined by the number of hours worked on a full time basis.

Table 6 details the estimated hours worked per week by specialist anaesthetists by age category, and Table 7 the average hours worked per week by specialist anaesthetists by State/Territory. This information comes from the AIHW Health Labour Force Survey (1995a). It should be noted that Medicare data was examined but not used, because the Working Party considered it provided a distorted picture, as its division between full time and part time is based on an income cut off point, which would not pick up on work in a public hospital. Survey data on total hours worked was therefore considered a more accurate indication of participation.

The information in Table 6 shows that of the 1,753 respondents to the AIHW survey;

- 79.7% worked over 40 hours per week;
- the majority (50.4%) worked between 41 and 60 hours per week;
- a small number (9%) worked more than 70 hours per week; and
- 5.5% worked 20 hours per week or less.

Table 6: Estimated hours worked per week by specialist anaesthetists; by age category, 1992-93

Age/ Hours	- 35 yrs	35-44 yrs	45-59 yrs	60-64 yrs	65-69 yrs	70 + yrs	Total
1-10	0	4	3	3	7	7	24
11-20	0	17	19	17	9	10	72
21-30	1	25	37	16	16	6	101
31-40	9	57	64	15	12	1	158
41-50	25	140	155	35	11	3	369
51-60	29	221	236	16	13	0	515
61-70	22	163	161	7	3	0	356
71-80	5	26	36	4	1	0	72
80 +	8	27	45	5	1	0	86
Total	99	680	756	118	73	27	1753

Source: AIHW

Table 7: Average hours worked per week by specialist anaesthetists; by State/Territory, 1993

Specialty	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	AUS
Anaesthesia	51.0	54.5	60.2	53.6	54.8	48.0	47.7	47.7	52.2

Source: AIHW

These estimates are remarkably consistent with the details provided by ANZCA from a

survey of members conducted in February 1994. ANZCA estimate 79.6% of members work over 40 hours per week. In the 1994 ANZCA survey, 87% of respondents defined their work practice as full time and 11% as part time.

Analysis of the ANZCA survey by gender showed that 85% of males and 54% of females worked greater than 40 hours per week. 26% of males and 10% of females worked greater than 60 hours per week.

85% of respondents spent up to 40 hours per week on call. The majority of female respondents (60%) spent less than 20 hours on call per week compared to 40% of males. Approximately 15% of all Fellows worked greater than 60 hours per week on call.

The ANZCA survey found that about equal numbers of male and female respondents worked part time. However, this represented a greater proportion of female Fellows (73 out of 192 respondents or 38%) compared with male respondents (68 out of 961 or 7%).

The respondents working in rural areas worked longer hours of normal work (33% worked greater than 60 hours per week compared to 26% regional and 21% city) and much more on call work. 22% of rural respondents did greater than 60 hours per week of on call work compared to 5-7% of city and regional respondents. 30% of rural respondents worked greater than 120 hours per week in total work, normal and on call.

ANZCA data indicates, 88.5% of female and 86.3% of male respondents worked some of their time in public practice, and of these, female respondents worked an average of 75% of their working time in public versus 60% for males.

83.2% of male and 76% of female respondents worked in private practice. Males spent, on average, 60% of their working time in private practice compared to 50% of working time for females Fellows.

Services Provided and Performed

Specialist anaesthetists offer a range of services in their field, including providing anaesthesia as required, acute pain management and intensive care work. ANZCA has estimated that the average full time specialist anaesthetist would expect to undertake at least 1,000 anaesthetic procedures per year.

Tables 8 and 9 provides information on the total number of Medicare services provided by anaesthetists, and the fees charged and benefits paid.

Table 8 shows that 57.5% of specialists provided more than 1,000 services in 1994-95. Perhaps more significantly 20.1% of specialists provided more than 2,500 services.

Table 8: Specialists anaesthetists; by number of Medicare services provided, 1994-95

Number of Services	No. of specialist	% specialists
--------------------	-------------------	---------------

less 100	173	9.85
100-199	118	6.72
200-299	70	3.99
300-399	84	4.78
400-499	61	3.47
500-749	144	8.20
750-999	96	5.47
1000-1249	124	7.06
1250-1499	98	5.58
1500-1749	126	7.18
1750-1999	99	5.64
2000-2249	109	6.21
2250-2499	101	5.75
more 2500	353	20.10
Total	1,756	100.00

Source: DSHS

Table 9 provides information on the total number of services provided by specialist anaesthetists in 1990-91 and 1994-95. The number of providers increased by 13.8% from 1990-91 to 1994-95 while the number of services provided increased by 14.7% over the same period. The average number of Medicare services provided in 1994-95 by specialist anaesthetists was 1,485. Medicare data also shows that in 1994-95 specialist anaesthetists direct billed 5.2% of their work.

Table 9: Specialist anaesthetists; by Medicare services provided, fees charged and benefits paid, 1990-91 and 1994-95

	No. of providers	Ave. no. services	Total no. of services	Fees charged \$	Benefits paid \$
1990-91	1,594	1,426	2,273,091	159,366,300	100,216,700
1994-95	1,814	1,485	2,607,312	217,360,276	134,015,353
% increase	13.8	4.1	14.7	36.4	33.7

Source: DSHS

The last ten years have seen some significant changes in what anaesthetists now do during their working week. The growth in day surgery has increased the overall time spent in preoperative assessment, often meaning an earlier start to the working day to

see day patients. The increased emphasis on informed consent means increased time can be spent in preoperative consultation. Similarly, there can be an increased workload due to post operative care. Whereas in the past anaesthetists would rarely see the patient after surgery, they are now responsible for analgesic techniques and modification as required for some days after major surgery.

In addition, acute pain management has now become a standard service in teaching hospitals. This has further reduced the hours available for the provision of anaesthetics in theatre.

Anaesthetists are also involved in teaching of cardio-pulmonary resuscitation and other more advanced techniques to paramedicals and other health care professionals. They are also involved in retrieval, aeromedical evacuation and counter disaster work.

In many private hospitals, epidural analgesia is requested by a significant number of patients and this requires dedicated and trained obstetric anaesthetists. This procedure is time consuming, not only in placement of the regional block but also in the ongoing commitment until the completion of the third stage of labour.

The other significant point on workload and services provided is the fact that anaesthetic specialists do more than merely give anaesthesia. Specialists are spending more time in management, research, quality assurance and other professional activities. Other activities can also include academia, acute and chronic pain management, perfusion and hyperbaric medicine to insurance, quality assurance and medical retrieval work.

ANZCA estimates that 60% of females and 53% of male Fellows are involved in teaching for an average of 5% of their working time. 45% of males and 40% of females were involved in administration for 10%, and in obstetrics for 5% of their working time.

Indeed, in 1995, ANZCA revised The Duties of an Anaesthetist which outlines the roles of an anaesthetist and the apportionment of time between clinical and other professional duties for full time, visiting and trainee anaesthetists. The paper concludes that "all staff must have sufficient exposure to clinical duties to maintain their skills. They must also have sufficient time set aside for other professional duties as defined in this document to ensure a high standard of practice both at a departmental or group level as well as on an individual basis" (ANZCA 1995).

Table 10 contains information on operating room procedures and is useful in indicating the number of services provided in public and private hospitals.

Table 10: Operating room procedures; by State /Territory and by public and private, 1991-92 and 1993-94

	1991-92 private	1991-92 public	1991-92 total	1993-94 private	1993-94 public	1993-94 total	%incr. total
NSW	132,788	256,563	389,351	222,839	270,036	492,875	26.6
Vic	-	186,591	-	-	213,250	-	-
Qld	-	115,127	-	108,196	123,565	231,761	-
SA	61,128	72,184	133,312	63,089	79,610	142,699	7.1
WA	53,878	75,499	129,377	-	76,230	-	-
Tas	19,592	16,559	36,151	20,771	17,045	37,816	4.6
ACT	-	12,567	-	8,799	12,082	20,881	-
NT	-	5,442	-	-	7,620	-	-
Total	267,386	740,532	1,007,918	423,694	799,438	1,223,132	21.4

Source: DSHS

The number of operations per year requiring anaesthesia equals about 10-12% of the population. It is not possible to be completely accurate because of missing private hospital data from several States. For those States that have provided complete data the 1993-94 percentages are 12.2% in New South Wales, 13.4% in Queensland, 10.2% in South Australia and 12.5% in Tasmania.

Table 11 provides data on principal diagnosis indicating anaesthesia by age group and shows that in 1992-93 10.7% of the population had a diagnosis indicating anaesthesia. People 65 years and over have the highest number of anaesthetics compared with other age groups (32.9% of the total diagnoses). This is quite significant given they represent only 11.7% of the total population.

Table 11: Hospital separations with a principal diagnosis indicating anaesthesia; by age group, 1992-93

	Age group					Total
	<15	15-29	30-44	45-64	65+	
1992-93 actuals:	(>000s)					
1993 population	3,831.1	4,108.8	4,129.2	3,531.4	2,060.9	17,661.4
% of population	21.69	23.26	23.38	19.99	11.67	100.00
Diagnosis separations	162.5	308.3	338.2	455.0	619.4	1,883.4
% of total diagnosis	8.63	16.37	17.96	24.16	32.88	100.00

Source: AIHW and ABS

Table 12 provides age standardised, anaesthetic services by capital city, rural, remote and urban Australians, per 1000 persons in 1992-93. Females had higher rates of anaesthesia in all states by geographic areas.

Table 12: Anaesthetic services, age standardised* ; by RARA classification, (per 1000 persons), 1992-93

Females				
	Capital City	Other Urban	Rural	Remote
NSW/ACT	185.7	166.8	59.8	140.8
Victoria	221.5	244.1	146.7	241.4
Queensland	196.8	226.9	172.6	106.0
SA /NT	219.4	-	117.6	120.1
West Australia	183.6	-	145.2	85.7
Tasmania	240.7	155.3	117.4	113.1

Males				
	Capital City	Other Urban	Rural	Remote
NSW/ACT	145.9	109.8	35.6	102.7
Victoria	133.1	131.5	101.1	107.1
Queensland	107.9	172.7	115.4	69.4
SA/NT	149.3	-	107.7	88.3
West Australia	131.1	-	95.9	51.3
Tasmania	150.2	110.0	93.0	85.3

* Age standardised utilisation rates were calculated separately for each sex and locality by the direct method using as the standard, age specific rates for the Medicare eligible population for the whole of Australia.

- not applicable

Source: Gadiel and Ridoutt 1994 (originally DSHS)

Training Arrangements

There has been an established specialist anaesthetic training program since 1952, initially under the Faculty of Anaesthesia in the Royal Australasian College of Surgeons and then through ANZCA when it was formed in 1992. ANZCA currently has established a fully-fledged training program for new specialists and a maintenance of standards and a continuing certification program for existing Fellows.

The ANZCA training program is for five years, with the change to a five year program occurring in 1985. Approximately 90% of trainees complete the program in five years.

The stage of training of a fifth year trainee (known as a Provisional Fellow) is sufficient for them to contribute half their working week as manpower.

ANZCA training requirements include a minimum of 24 months general hospital appointments before Vocational Training can commence. Trainees are then required to complete a minimum of 60 months Vocational Training in accordance with the requirements of the Regulations and Administrative Instructions covering training and examinations, in one or more training programs approved by the ANZCA Council.

Trainees are required to pass a Primary Examination in Basic Sciences, and a Final Examination in either Anaesthesia or Intensive Care. The Provisional Fellow year cannot commence until the first four years of training are completed and the Final Examination is passed. Provision exists for a Fellow endorsed in either Anaesthesia or Intensive Care to achieve endorsement in the other after further approved training and successful completion of the relevant Final Examination.

Some provision exists for recognition of overseas training, for interrupted training, and for part time training.

The number of training posts (years 1 to 4) is shown in Table 13. This table does not include Provisional Fellows (fifth year trainees). Provisional Fellows are not attached to a training post.

Table 13: Anaesthetic training posts; by State and year, 1984 to 1995

Year	NSW	Victoria	Qld	SA	WA	Tas	Total
1984	101	71	47	42	28	5	294
1985	98	70	48	49	28	5	298
1986	88	68	48	45	28	6	283
1987	85	69	44	45	31	7	281
1988	86	74	45	45	31	7	288
1989	89	76	48	47	31	7	298
1990	90	83	46	47	31	7	304
1991	94	84	46	48	31	7	310
1992	105	84	46	42	31	7	315
1993	109	81	52	42	31	8	323
1994	110	91	52	42	35	8	338
1995	119	99	61	46	35	9	369
% increase 1984-95	17.8	39.4	29.8	9.5	25	80	25.5

Source: ANZCA

The percentage of female anaesthetists in training, as well as the distribution of trainees across the states is given in table 14 (this table includes fifth year trainees, hence the difference in the totals in this table and table 13). The most populous states have the largest number of trainees.

Table 14: Specialist anaesthetists in training; by State/Territory and gender, 1995

	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	Total
Males	105	85	53	38	22	5	3	3	314
Females	43	30	17	7	12	1	0	0	110
Total	148	115	70	45	34	6	3	3	424
% females	29.1	26.1	24.3	15.6	35.3	16.7	0	0	25.9

Source: ANZCA

27% of those admitted for anaesthetic training in 1995 were female. Considering the long training time, it is probable that the percentage of females in the anaesthetic workforce will increase slowly over the next ten years. It is, however, expected that many women take time off from practice to have families and may not return to the workforce on a full time basis, particularly in anaesthesia as this is one specialty which lends itself more easily to part-time work. This would see a continuation of the pattern of hours worked discussed earlier.

ANZCA also has a maintenance of standards program which is aimed at maintaining standards and a prescribed amount of work in clinical anaesthesia. This program is also available to specialist anaesthetists who are not Fellows of ANZCA.

Training opportunities for GPs in anaesthesia have been developed under the auspices of the Joint Consultative Committee between ANZCA and the Royal Australian College of General Practitioners (RACGP). This is particularly aimed at meeting the training requirements of rural GPs.

ADEQUACY OF THE CURRENT ANAESTHETIC WORKFORCE

Anaesthetist:Population Ratios

Various measures have been employed to assess the adequacy of medical service provision. The most widely used have been practitioner to population ratios or their variations such as location quotients (Harris and Lee 1992).

The Medical Workforce Data Review Committee (MWDRC) accepted as reasonable a specialist anaesthetist to population ratio (APR) of 1:10,000 (MWDRC 1995). ANZCA has also worked on an APR of 1:10,000. However, this figure was set before the growth in pain management and informed consent and so for some time there has been a feeling it may no longer be relevant and that a new benchmark should be established. The APR for recent years would seem to confirm the need to consider a new benchmark.

The anaesthetist workforce has grown relatively quickly over the past ten years. In 1984-85 1,219 specialist anaesthetists were identified from Medicare data. The figure in 1994-95 was 1,814, an increase of 48.8% over the period 1984-85 to 1994-95. The overall numbers of anaesthetist per population increased from 1:12,373 to 1:9,936 between 1984-85 and 1994-95 (table 15). Using the Working Party's estimate of the current specialist workforce of 1,948, gives an APR of 1:9,252.

Table 16 highlights the considerable variation in the anaesthetist:population ratio (APR) across the States and Territories, ranging from 1:7,847 in South Australia to 1:17,410 in the Northern Territory .

Table 15: Specialist anaesthetist:population ratio; by year, 1984-85 to 1994-95

Year	Specialist Anaesthetist (Medicare data)	Population ('000)	Population per Specialist Anaesthetist
1984-85	1219	15,788.3	12,952
1985-86	1277	16,018.4	12,544
1986-87	1369	16,263.3	11,880
1987-88	1423	16,538.2	11,622
1988-89	1495	16,814.4	11,247
1989-90	1537	17,065.1	11,103
1990-91	1594	17,284.0	10,843
1991-92	1656	17,489.1	10,561
1992-93	1712	17,656.4	10,313
1993-94	1787	17,843.3	9,985
1994-95	1814	18,023.8	9,936

Note: 1993-94 and 1994-95 population are estimates Source: DSHS and ABS

Table 16: Specialist anaesthetist:population ratio; by State/Territory, 1984-85 and 1994-95

	NSW	Vic	Qld	SA	WA	Tas	ACT	NT
1984-85								
Special.	451	311	136	137	114	29	20	7
Pop ('000)	5464.5	4120.1	2571.2	1371.2	1418.6	442.8	251.4	148.5
APR	12,116	13,248	18,906	10,009	12,444	15,269	12,570	21,214
1994-95								
Special.	602	469	291	188	173	49	32	10
Pop ('000)	6108.4	4500.8	3255.7	1475.2	1721.8	478.1	309.0	174.1
APR	10,147	9 597	11,188	7,847	9,953	9,757	9,656	17,410

Source: DSHS and ABS

Those States and Territories with the highest APR (the Northern Territory, Queensland, New South Wales and Western Australia) are also the States and Territories with the highest public hospital vacancies and use of TRDs (Queensland, New South Wales, Western Australia and the Northern Territory).

Gadiel and Ridoutt in their work on rural specialist services used an index of relative endowment as a measure of the adequacy of services. The index is calculated as the ratio of the total Medicare population per FTE doctor to the local area population per local FTE doctor x 100. Their results for anaesthetics is summarised in Table 17 and serve to highlight the distributional differences between States and geographic areas within States. Note an index of 100 is the national standard (Gadiel and Ridoutt 1994).

Table 17: Specialist anaesthetists index of relative endowment; by State/Territory. 1992-93

	Capital City	Other Major Urban	Rural	Remote	Total
NSW/ACT	114	94	53	1	96
Victoria	131	138	39	80	109
Queensland	122	167	29	1	99
SA/NT	144	-	9	7	104
West. Aust.	119	-	18	7	90
Tasmania	147	-	31	0	92
AUSTRALIA	124	128	38	13	100

Source: Gadiel and Ridoutt 1994

The indices for anaesthetics closely paralleled those for the various surgical disciplines.

Gadiel and Ridoutt cautioned that the use of the index should be balanced with qualitative stakeholder assessment, so as to canvass specific local influences.

The Working Party asked each State health department for their views on the adequacy of the current anaesthetic workforce and in general the views confirmed the APR and endowment index figures. In particular, the need for additional rural specialists was highlighted by New South Wales, Victoria, South Australia, Western Australia and Tasmania.

Public Hospital Vacancy Rate

Another measure of the adequacy of service provision is the public hospital vacancy rate. The difference between active supply and current requirements is expressed as the vacancy rate or level of unfilled positions. Note that Visiting Medical Officer (VMO) appointments to several hospitals mean that the VMO head count is not a count of the number of anaesthetists but of the number of VMO anaesthetist positions. Of the hospitals with VMOs 25% did not provide a FTE figure, so the VMO FTE figure can be expected to be a little higher (hospitals were asked to use 35 hours or more as equal to one FTE) .

Table 18 shows that staff specialist anaesthetists vacancies totalled 65.5 (61 FTE) with 32 (14.5 FTE) VMO vacancies. This gives a vacancy rate of 14.2% on FTE staff specialist anaesthetists and a rate of 2.3% on FTE VMO anaesthetists. Geographically the vacancies were greater in New South Wales (Greater Western Sydney and the Illawarra in particular) and Queensland (especially in other major urban areas of the Gold Coast, Toowoomba, Rockhampton and Townsville).

The survey also found there were 16 TRDs filling staff specialist positions and 3 TRDs filling VMO positions. The largest use of TRDs was in New South Wales (Blacktown, Prince of Wales and Royal North Shore hospitals) and in Western Australia (Royal Perth hospital). Since conducting the survey it is understood the new funding package now provided in Queensland has seen a significant reduction in the vacancies in Queensland.

The public hospital vacancies certainly give no evidence of oversupply and give slight weight to a proposition of some undersupply of anaesthetists.

Table 18: Public hospital anaesthetic positions and vacancies; by State/Territory, 1995

	<u>NSW</u>	VIC	QLD	WA	SA	TAS	ACT	NT	TOTAL
Staff specialist									
head count	97.5	95	74	53	74	21	2	4	420.5
FTE	86.8	91.5	69.5	40.1	71.6	21	2	4	386.5
vacancy hd count	21.5	8	27	2	7	0	0	0	65.5
vacancy FTE	20	8	25	2	6	0	0	0	61
TRD hd count	4	0	3	7	0	0	0	2	16
TRD FTE	4	0	3	7	0	0	0	2	16
VMO									
head count	617	641	182	328	54	18	23	4	1867
FTE	238.2	139.1	25.2	21.6	5	4.9	23	1.2	458.2
vacancy hd count	19	6	4	2	1	1	0	0	33
vacancy FTE	4.35	4.5	1.0	0.5	0.1	0.5	0	0	11
TRD hd count	3	0	0	0	0	0	0	0	3
TRD FTE	1	0	0	0	0	0	0	0	1

Source: AMWAC Public Hospital Specialist Vacancy Survey, November 1995

Table 19 provides details for intensive care anaesthetists. The intensivist staff specialist vacancies were 24 (22.4 FTE) and the VMO vacancies were 2 (1.2 FTE). This gave a vacancy rate of 22.2% for staff specialist intensivists and 12% for VMO intensivists. Again the vacancies were highest in New South Wales (Greater Western Sydney and the Illawarra) and Queensland (Brisbane). No TRDs were filling intensivist positions.

Table 19: Public hospital intensive care anaesthetists positions and vacancies; by State/Territory, 1995

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	TOTAL
Staff Special									
head count	34	20	12.5	11	14	1	3	0	95.5
FTE	24.9	13	12	11	13.35	1	3	0	78.25
vacancy	12.5	1	8.5	0	2	0	0	0	24
vacancy FTE	11.4	1	8	0	2	0	0	0	22.4
VMO									
head count	21.5	21	2	1	0	0	0	0	45.5
FTE	3.6	3.45	1.3	0.5	0	0	0	0	8.85
vacancy hd count	0	1	1	0	0	0	0	0	2
vacancy FTE	0	1	0.2	0	0	0	0	0	1.2

Source: AMWAC Public Hospital Specialist Vacancy Survey, November 1995

Elective Surgery Waiting Lists and Waiting Times

Elective surgery waiting lists are often used as indicators of the adequacy of services. However, the Working Party took the view that waiting lists were not a significant indicator of the requirement for services because there is a lack of consistent standardised collection and reporting which hampers any meaningful national interpretation.

Total numbers of people on waiting lists are of limited use. They conceal the fact that large numbers of people proceed through the system within a reasonable time. (AIHW 1994a). Moreover, waiting lists can be open to manipulation, especially in the way they are maintained and through such devices as the allocation of theatre time and resources.

The AIHW has tried to provide some degree of national interpretation of waiting lists by conducting a survey of State and Territory health authorities to estimate both the numbers of patients currently waiting for surgery and the times people wait. From the data supplied, there were an estimated 644 people per 100,000 population waiting for elective surgery in 1993. As 11% of removals from waiting lists are for reasons other than admission for surgery, it was estimated that 572 people per 100,000 would accept a hospital place if offered (AIHW 1994a).

The role that the anaesthetic workforce plays in the length of, and the clearing of, waiting lists is difficult to estimate. There would be some instances when operating theatre lists are cancelled due to unavailability of anaesthesia staff but this is not quantifiable. Eventually, anaesthetists provide anaesthesia as required regardless of waiting lists or category of patient and in this regard the availability of funding is more often than not the limiting factor rather than a shortage of workforce.

Given all these factors it is considered difficult to use waiting lists and waiting times as a reliable indicator of a medical workforce shortage. However, as better reporting and national guidelines on monitoring are developed, waiting lists may become a more useful tool.

Anaesthetists Opinions

The 1994 ANZCA survey asked if members were satisfied with their current workload and the vast number of respondents indicated they would like to work a bit less or were satisfied with their current workload (82% males, 85% females). Only 1.5 % of male respondents would like much more work. In general, satisfaction with current workload decreased with increase in hours worked except for four respondents who, despite two of them working more than 120 hours per week, wanted much more work. Inter state differences existed with more respondents from Northern Territory and Tasmania wanting much more work.

From the 1994 ANZCA survey, the majority of respondents (45%) were of the opinion that the number of anaesthetists being trained is about right. There was equivalent opinion amongst males that the number being trained is either too few or too many (approximately 25% each way). More female Fellows feel that the number being trained is too few (33%) as opposed to too many (10%). Except for 17 of the respondents, the trend was for a need to increase training numbers as total hours worked increased.

PROJECTIONS OF REQUIREMENTS

Population

Australia has a growing and an ageing population. In 1993 Australia's population was 17.84 million. The ABS estimates that population will reach 19.169 million by 2001 and 20.095 million by 2006 (ABS 1994). (Note these projections use the ABS series). This is an annual population growth rate of 1.2%.

ABS estimates that the median age of the total population will rise from 33.1 years in 1993 to between 39.4 and 41.8 years in 2041. As a proportion of the total population, those aged 65 and over represented 11.7% (2.1 million) in 1993, and will increase to around 2.56 million in 2006 (ABS 1994).

Changes in Utilisation

The AIHW has applied current utilisation rates to the population profile in 2016, taking into account the different utilisation of anaesthesia by different age groups, and the projected ageing of the population, and has estimated the demand for anaesthesia services in hospitals is to increase by 38% over the next 20 years (see table 20). This increase is principally due to ageing of the population and the higher demand for services by the older age groups.

This shows that the size of population on which surgery is being performed is increasingly growing.

Table 20 shows that the over 65 years age group will continue to comprise the bulk of hospital separations - 39.25% of separations by 2016; rising from 32.88% in 1992-93. Both the over 65 years of age and the 45 to 64 years of age categories are expected to significantly increase their utilisation - by 64.9% and 60.7% respectively. Similar trends are observable for principal procedures indicating anaesthesia (AIHW 1995b).

A significant factor contributing to the ageing of the population is the increase in life expectancies. However, this increase in life expectancy has not been matched by an increase in disability free life expectancy. Factors that might contribute to this include an increased incidence of chronic disease, improved survival leading to increased prevalence, earlier diagnosis of these conditions and changes in societal perception of disability and expectations of health. Major causes of hospital admission for the 65 year plus age group include, heart conditions, dialysis, respiratory diseases, cataracts, hip fractures and prostate disorders.

Table 20: Projected increase in hospital separations with a principal diagnosis indicating anaesthesia ('000s); by major age category, 1993 and 2016

	less 15 yrs	15 to 29 yrs	30 to 44 yrs	45 to 64 yrs	over 65 yrs	Total
1992-93						
Population	3,831.1	4,108.8	4,129.2	3,531.4	2,060.9	17,661.4
% of population	21.69	23.26	23.38	19.99	11.67	100
Separations	162.5	308.3	338.2	455.0	619.4	1,883.4
% separations	8.63	16.37	17.96	24.16	32.88	100
2016 forecasts						
Population	4,048.6	4,278.2	4,360.9	5,673.8	3,398.7	21,760.2
% of population	18.61	19.66	20.04	26.07	15.62	100
Separations	171.8	321.0	357.2	731.0	1,021.5	2,602.4
% separations	6.60	12.33	13.73	28.09	39.25	100
% increases 1993 to 2016						
Population	5.7	4.1	5.6	60.7	64.9	23.2
Separations	5.7	4.1	5.6	60.7	64.9	38.2

Source: AIHW and ABS

Changes in Technology and Options For Service Provision

It has always been difficult to predict how future changes in surgical activity will affect future workforce requirements. Whenever a new procedure or technology is developed and particularly if it provides a surgical solution to a condition that was previously treated medically (and especially if it is a common condition), it must inevitably increase the demand for anaesthetists. The converse is of course true also, that is if a treatment for a surgical procedure becomes almost entirely medical the demand for anaesthesia can be expected to decrease. Such events are of course beyond reliable speculation and must be dealt with as they arise.

Substantial changes in technology have occurred over the past 10 years. These have had a major impact on improving the quality and safety of anaesthetics. In the tertiary sector there have been enormous changes, for example in transplant work and in the increased utilisation of other high technology procedures, which require several anaesthetists to be in attendance or available.

Current trends towards more complex surgery have increased the operating and monitoring requirements of patients, whilst greater surgeon and patient expectations have increased the need for advanced pain relief techniques. The expectation of a good outcome following surgery and anaesthesia has increased the need for post

anaesthesia follow up and increased supervision of junior registrars whilst administering anaesthetics.

Similarly, some technologies are reducing the numbers of patients requiring open surgery and thus decreasing the need for general anaesthesia.

The use of endoscopy in gastrointestinal and obstetric/gynaecological applications (405,800 and 160,000 services respectively) in 1992-93 exceeds all other applications of the technology. Since 1985-86 the number of services has increased by 69% and 218% respectively. The introduction of Medicare items for laparoscopic surgery has also resulted in a significant increase being recorded in these services, from 38,400 services in 1991-92 to 56,200 services in 1992-93 (AIHW 1994b). It is expected that the continued increase in day case treatment in public and private hospitals, particularly endoscopy lists, will require more anaesthetic input.

The easy availability of flexible cystoscopy without general anaesthesia has led to some increase in this diagnostic manoeuvre in an outpatient setting. This change is likely to continue. Prostatic biopsy also used to be an inpatient procedure and used to be performed under anaesthetic. It is now usually done as an office procedure.

There has been an increase in the number of diagnostic and therapeutic arthroscopies, but at the same time it is also envisaged that there will be a decrease in some areas such as trauma and paediatric congenital deformities.

The use of ophthalmological applications of lasers has increased 295% since 1985-86 and is expected to continue to increase (AIHW 1994b).

In radiology departments, there may be a slight increase in anaesthetic requirement in interventional work, especially some forms of endovascular work, but magnetic resonance imaging is to a certain extent replacing procedures such as myelography which from time to time require anaesthetic intervention.

There will also be more focus on procedures that improve quality of life rather than curing disease, such as surgical treatment for impotence, incontinence and cosmetics. Electro convulsive therapy provided in psychiatry now also requires the attendance of an anaesthetist at all times.

It is estimated that requirements for regional blocks for pain relief in labour will continue at about the present rate. Increasing midwife involvement and birth centre popularity will, to some extent, reduce incidence of epidural block and general anaesthesia but the provision of cover for services will need to continue. A greater involvement of anaesthetics in management of acutely ill obstetric patients in hospital, will continue to increase, especially in non-teaching and smaller units. The services of anaesthesia in obstetric institutions must be recognised as an important aspect of safe, modern obstetrics and adequate recognition and reward for these services must be addressed. Anaesthetists will be involved in an increasing role in educational aspects of obstetrics analgesia and anaesthesia. Major gynaecological surgery will continue at about the same rate as at present and major oncological work in gynaecology should gradually

increase as the population continues its ageing process.

Anaesthetists are also actively involved in the treatment of post operative pain, chronic pain, intravenous therapy in various forms, preoperative assessment of patients so that day surgery admission is facilitated, and hyperbaric medicine.

The decrease in hospital lengths of stay, and technology that decreases theatre time, will increase surgery throughput. However, this will not have a great impact on the anaesthetist workforce, as anaesthetists usually work theatre sessions. Of course this would change if theatre sessions are increased by longer theatre operating hours.

The increased patient population without private health insurance has also increased the demand for surgery in the public hospital system. The inevitable result of these influences has been an increased demand for anaesthetic services and a higher standard of anaesthesia being expected.

On balance, the Working Party found no evidence to suggest that technology would dramatically increase or decrease the current trend in demand for anaesthesia.

Interestingly, the Committee on Inquiry Into Medical Education and Medical Workforce (Doherty 1988) and the more recent Medical Workforce Standing Advisory Committee in the United Kingdom (MWSAC 1995) reached similar conclusions on medical technology.

Doherty (1988) - "The Committee believes that the rate of technological change on medicine may well increase in the future and that new technology is likely to exacerbate existing pressures for fragmentation of the medical workforce into specialty and subspecialty groups. This may well lead to an increase in the overall demand for the number of medical practitioners who are specialists... The Committee notes the history of technological advances, some of which led to increased demand for medical practitioners, for example the ability to treat or cure previously untreatable conditions... and some to decrease demand, for example, simpler and less invasive procedures. The Committee is unable to predict what sort of change will predominate in the future.≡

The Medical Workforce Standing Advisory Committee concluded "that there are no indications at present that fewer medical personnel will be required to provide health care as the diversity and extent of technology increases." (MWSAC 1995).

PROJECTIONS OF SUPPLY

Changes in Supply

It is estimated that 40 anaesthetists will leave the workforce each year.

It is expected that an average of 80 new specialist anaesthetists will enter the workforce up to 2000 (ranging from 76 in 1995 to 84 in 1999) and that 92 will enter the workforce in 2000.

Women in the Workforce

It is expected that the proportion of women in the workforce will increase; as is demonstrated by the increase in the number of female trainees; women represent 17% of the current workforce but 25.9% of trainees.

Increasing numbers of women specialising in anaesthesia has implications for the available workforce in the future. Many women may take time off from practice to have families and may not return to the workforce in a full time capacity, especially as anaesthesia is one specialty which easily lends itself to part time work.

Provision of Services in Rural and Remote Areas

Provision of specialist services outside capital cities and major urban areas will continue to be of concern, as there is little incentive to practice in rural areas. Traditional anaesthetic services in country hospitals can be expected to continue to need to be provided by general practitioners.

There are obviously some communities where there is insufficient workload to warrant recruitment of specialist anaesthetists. In addition, some rural anaesthetists will have obtained their qualifications some years ago and may now not feel comfortable in other areas such as intensive care and transport and retrieval medicine, which now form part of anaesthetic training. It is important to encourage GPs to obtain, maintain and utilise their skills in anaesthesia to provide these services. Appropriate training and retraining opportunities together with appropriate remuneration and indemnity arrangements appear to be barriers to GPs obtaining and using their anaesthetic skills.

Continuing education programs need to be developed to encourage GPs to maintain their practice in anaesthesia. This should be undertaken through the existing Joint Consultative Committee between ANZCA and RACGP. Governments will need to consider if they wish to provide appropriate remuneration incentives, or assist with meeting the increasing costs of medical indemnity insurance.

It should also be stressed that if surgical outreach programs develop, similar provision of specialist anaesthetic services will be required.

BALANCING SUPPLY AGAINST REQUIREMENTS

Requirements Trends

Over the next 10 years the Australian population is expected to increase at an annual rate of 1.2% per year. This would be the rate of growth required to maintain a constant APR.

The combined effects on demand for anaesthetics services due to population growth and ageing can be calculated from age specific projections of hospital activities. Projections of hospital separations for patients with a principal diagnosis indicating anaesthesia by age group shows an increase of 1.4% per year. Similarly projections of hospital separations for patients with a principal procedure of anaesthesia shows demand will increase by 1.3% per year. For anaesthetic services, ageing effects are estimated to be at least 0.2% above population growth and possibly higher.

Between 1990-91 and 1994-95 Medicare specialist anaesthetic services grew by 14.7% (see Table 9). This suggests an increase in requirements of 2% above population growth and a maximum annual growth in requirements of 3.4%. Annual growth in requirements of a more moderate 2.4% per annum is also examined.

Anaesthetists do not work a uniform full time working week so it is appropriate to measure services in required hours instead of a head count. In 1995 anaesthetists provided an estimated total of 100,049.5 hours of services per week. However, surveys of public hospitals and the profile of hours worked suggest this supply is below current demand and that actual requirements are probably about 3% higher at 103,051 hours per week. Table 21 shows the expected increase in hours worked per week between 1995 and 2006 using five different requirements scenarios.

Table 21: Projected requirements for anaesthetic services; by hours worked per week, 1995 to 2006

Year	Population Growth (1.2% per year)	Projected Procedures (1.3% per year)	Projected Diagnosis (1.4% per year)	Activity growth of 2.4% per year	Activity growth of 3.4% per year
1995	103,051	103,051	103,051	103,051	103,051
2000	109,384	109,926	110,469	116,025	121,802
2006	117,500	118,783	120,080	133,768	148,860

Source: van Konkelenberg

Supply Trends

The supply of specialist anaesthetists was projected by ageing the 1995 supply through 10 year age cohorts, adding the expected new graduates for each year up to 2001, and subtracting projected retirements. The number of anaesthetists was then converted to hours per week by applying the average number of hours worked in each age cohort

(detailed in Table 6). These projections show that supply will increase from a current level of 100,050 hours per week to 125,912 hours per week by 2006; with the upper and lower projection range being 120,911 to 132,807 hours per week (see Table 22).

Table 22: Projected supply of anaesthetic services; by hours worked per week, 1995 to 2006

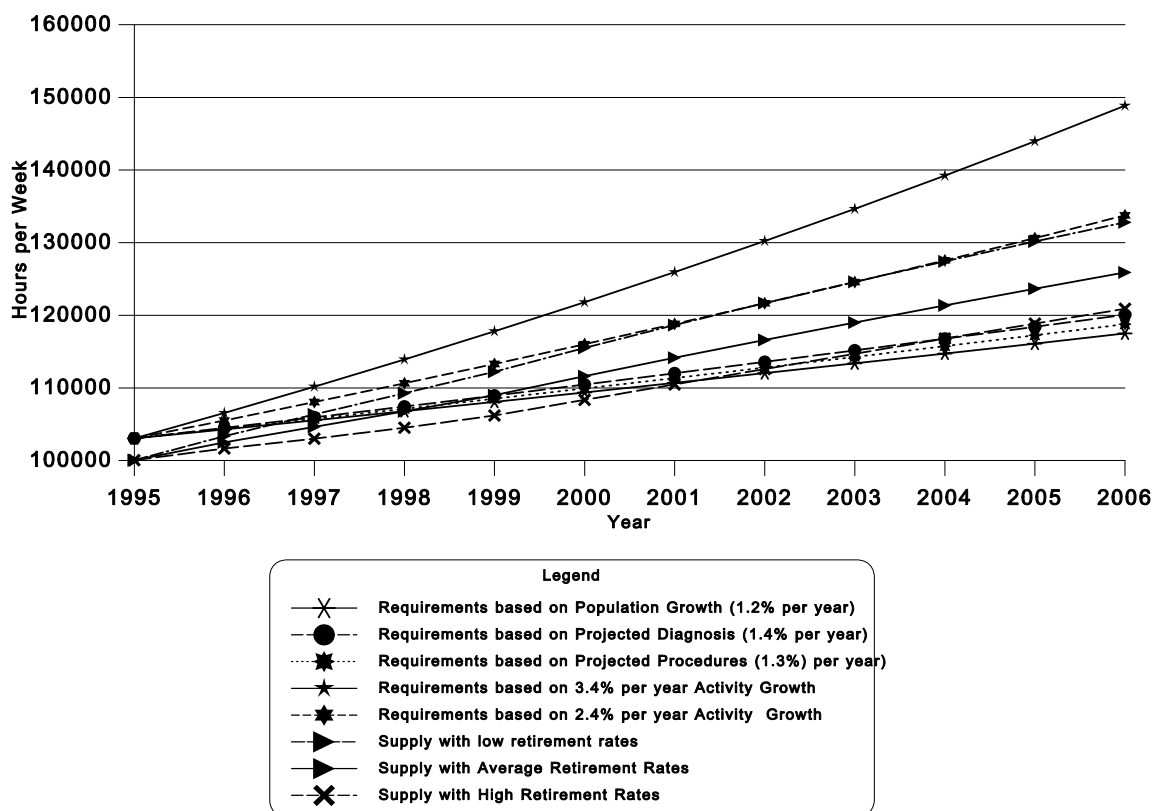
Year	Low retirement rate	Average retirement rate	High retirement rate
1995	100,050	100,050	100,050
2000	118,667	111,621	108,353
2006	132,807	125,912	120,911

Source: van Konkelenberg

Projected Balance

The projections are summarised in Figure 2.

Figure 2: Projected anaesthetic supply and requirements, 1995 to 2006



The projected supply is sufficient to meet increased requirements resulting from population growth and ageing. However, there is an increasing shortage of projected supply once requirements based on growth in activity trends are considered and a large potential shortfall if the current trend in activity (3.4% per year) continues. Therefore, the anticipated supply will not be sufficient to meet expected requirements over and above population growth.

These results suggest that with a trend in activity growth of 2.4% per year the number of anaesthetic graduates will have to increase to 122 by 2005.

If the trend in activity growth is 3.4% per year the number of anaesthetic graduates will have to increase to 172 by 2005. Under either scenario the current expected graduate output of 92 after 2000 will not be sufficient to balance projected supply with projected requirements.

There are many different graduate output patterns that could produce a balance between projected supply and projected requirements. Two scenarios are summarised below in Tables 23 and 24.

Table 23: Anaesthetic graduate output needed to balance projected supply with projected requirements (2.4% growth in activity per year); by hours worked per week, 1995 to 2006

Year	Number of graduates	Projected supply	Projected requirements (2.4% annual activity trend)	Shortfall	% Shortfall
1995	76	100,050	103,051	3,001	2.91
1996	78	102,513	105,524	3,011	2.85
1997	79	104,641	108,057	3,416	3.16
1998	81	106,782	110,650	3,868	3.50
1999	84	109,005	113,306	4,300	3.80
2000	92	111,621	116,025	4,404	3.80
2001	99	114,578	118,810	4,231	3.56
2002	107	117,949	121,661	3,713	3.05
2003	112	121,559	124,581	3,022	2.43
2004	117	125,416	127,571	2,155	1.69
2005	122	129,525	130,633	1,107	0.85
2006	122	133,588	133,768	180	0.13

Source: van Konkelenberg

Table 24: Anaesthetic graduate output needed to balance projected supply with projected requirements (3.4% growth in activity per year); by hours worked per week, 1995 to 2006

Year	Number of graduates	Projected supply	Projected requirements (current 3.4% per year activity trend)	Shortfall	% Shortfall
1995	76	100,050	103,051	3,001	2.91
1996	78	102,513	106,555	4,041	3.79
1997	79	104,641	110,178	5,537	5.03
1998	81	106,782	113,924	7,141	6.27
1999	84	109,005	117,797	8,792	7.46
2000	92	111,621	121,802	10,181	8.36
2001	132	116,574	125,943	9,370	7.44
2002	142	122,060	130,225	8,166	6.27
2003	152	128,088	134,653	6,565	4.88
2004	162	134,666	139,231	4,566	3.28
2005	172	141,494	143,965	2,471	1.72
2006	172	148,574	148,860	286	0.19

Source: van Konkelenberg

The results of this projection work show that the current level of graduate output is unlikely to be sufficient to balance future requirements and that some increase will be necessary. The magnitude of these increases is dependent upon the assumptions that are made about projected requirements but under the scenarios presented in this report can be expected to range between 122 graduates and 172 graduates per year by 2005.

If the target of 122 graduates is desired an additional 120 training positions would be required. If the target of 172 graduates is desired an additional 320 training positions would be required.

The Working Party recognises that these increases have significant resource implications for government. It is also concerned about maintaining the quality of training, which will clearly have to be monitored closely by ANZCA.

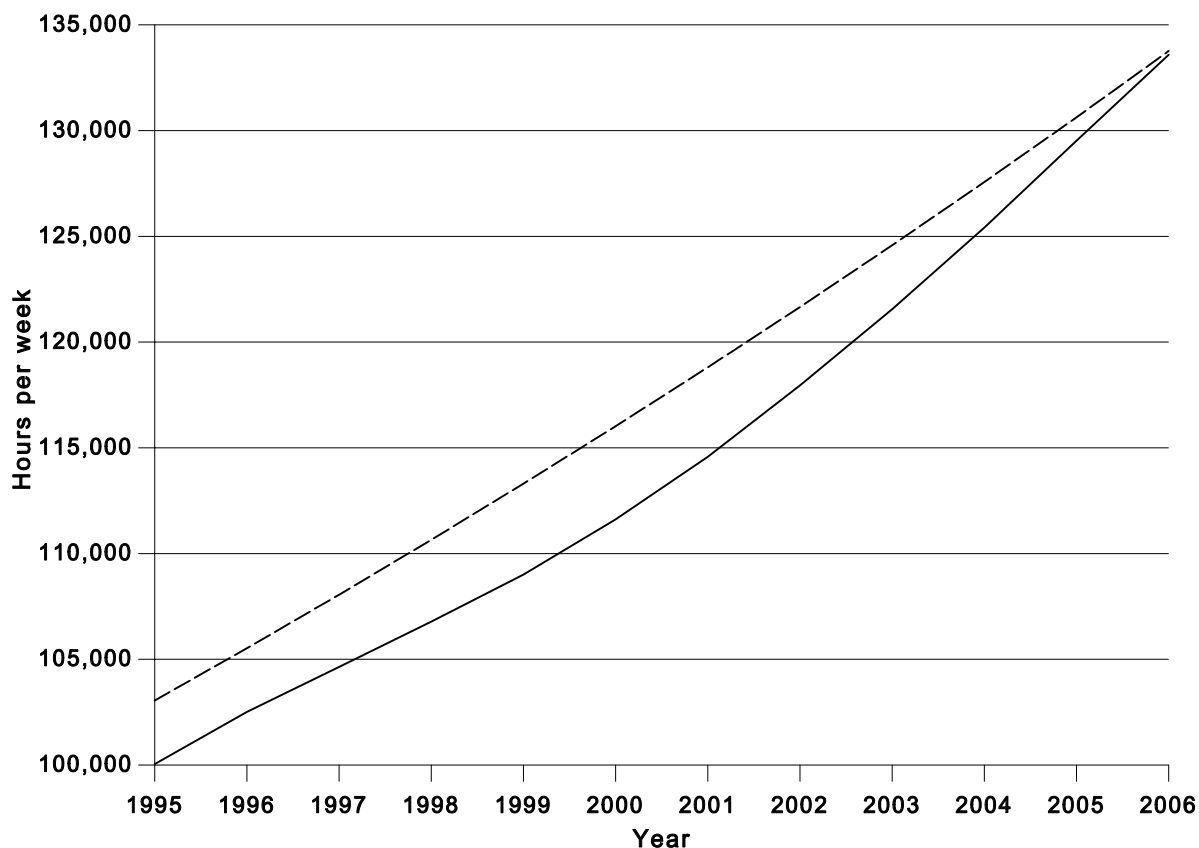
A definitive conclusion on the appropriate graduate output to balance projected supply with projected requirements is difficult. If growth in requirements is only equivalent to the expected trends in population and ageing then there will be no need for additional graduates. This however, is not the recent trend and not the conclusion of the Working Party.

The Working Party concluded that growth in requirements could be expected to be between this figure of 1.4% per year and a maximum of 3.4% per year. In making its recommendations the Working Party used 2.4% as the expected future annual growth in requirements.

With the suggested growth rate of graduate outputs summarised in table 23, the potential shortfall in anaesthetists is expected to be a maximum of 3.8% in 1999 and 2000. It will be necessary to monitor the workforce situation and, if necessary, to formulate effective ways of accomodating excess demand for the period of relative potential shortfall.

The recommended scenarios for supply and requirements are summarised in Figure 3.

Figure 3: Elimination of the potential shortfall - projected anaesthetic supply and requirements, 1995-2006



----- requirements (2.4% annual growth in activity)
 _____ supply (including suggested graduate output to balance with requirements in 2006)

RECOMMENDATIONS

The Working Party recommends:

1. There be an increase in the number of funded anaesthetic training positions and trainees to match an expected future growth in activity of 2.4% per year.
2. That State health departments undertake immediate negotiations with ANZCA for the establishment of additional training positions, initially up to a maximum of 28 in 1997, distributed as shown in the following table:

Table 25: Additional anaesthetic training posts; by State/Territory, 1997 and 2006

State/Territory	1995	1997	2006	Increase 1995 to 1997	Increase 1995 to 2006
NSW/ACT	119	130	170	11	51
Victoria	99	105	120	6	21
Queensland	61	67	91	6	30
SA/NT	46	47	49	1	3
West Australia	35	38	47	3	12
Tasmania	9	10	12	1	3
AUSTRALIA	369	397	489	28	120

3. In recognition that this measure will not provide an effective contribution to the anaesthetic workforce until 2001, State based anaesthetic services working groups, comprising ANZCA and State department of health representatives, be established to address what short term local measures need to be adopted to meet any shortfall.
4. Options for consideration by the anaesthetic services working groups include local incentives to increase the current work load of specialist anaesthetists; use of appropriately qualified and skilled overseas trained anaesthetists; and increased skilling and use of general practitioners, particularly in rural areas.
5. That AMWAC co-ordinate a more definitive analysis of anaesthetic stakeholders views in order to further refine the anticipated trend in activity growth.
6. That anaesthetic requirements and supply projections be monitored annually so that they can be amended if new trends emerge.
7. That this monitoring be co-ordinated by the ANZCA and AMWAC and the results incorporated into AMWACs annual report to AHMAC. AMWAC will provide any necessary support.
8. AMWAC examine strategies to obtain data on the size and practice patterns of general practitioners who provide anaesthetic services.

APPENDIX

Submissions on factors affecting the current and future market for anaesthetic services were sought from the following organisations:

Organisation	Record of response
Australian Dental Association	✉
Australian Orthopaedic Association	✉
Australian Society of Otolaryngology, Head and Neck Surgery	x
Gastroenterological Society of Australia	✉
Royal Australasian College of Dermatologists	✉
Royal Australasian College of Physicians	x
Royal Australasian College of Surgeons	✉
Royal Australian College of Dental Surgeons	✉
Royal Australian College of General Practitioners	x
Royal Australian College of Obstetricians and Gynaecologists	✉
Royal Australian College of Ophthalmologists	✉
Royal Australian College of Radiologists	✉
Royal Australian and New Zealand College of Psychiatrists	x
Urological Society of Australia	✉
Australian Capital Territory Department of Health and Community Care	✉
New South Wales Department of Health	✉
Northern Territory Department of Health and Community Services	x
Queensland Department of Health	✉
South Australian Health Commission	✉
Tasmanian Department of Community and Health Services	✉
Victorian Department of Health and Community Services	✉
Western Australian Health Department	✉

KEY x no response ✉ correspondence received

REFERENCES

- Australian Bureau of Statistics (1994), Projections of the Populations of Australia, States and Territories: 1993 to 2041. Catalogue no. 3222.0 1994, Canberra
- Australian Bureau of Statistics (1993), Private Hospitals Australia 1991-92. Catalogue no. 4390.0, Canberra
- Australian Institute of Health and Welfare (1994a), Australia's Health 1994, Canberra, AGPS
- Australian Institute of Health and Welfare (1994b), Health Technology Statistics Bulletin, June 1994, Canberra
- Australian Institute of Health and Welfare (1995a), Health Labour Force 1992-93, Canberra
- Australian Institute of Health and Welfare (1995b), Anaesthesia Labour Force Profile, unpublished data collection
- Australian Institute of Health and Welfare (1995c), Anaesthesia Labour Force Profile number 2, unpublished data collection
- Australian and New Zealand College of Anaesthetists (1990), Manual On Training, Melbourne
- Australian and New Zealand College of Anaesthetists (1995), The Duties Of An Anaesthetist, Melbourne
- Department of Human Services and Health (1994), Rural and Remote Area Classifications, Canberra
- Doherty Professor R, et al (1988), Australian Medical Education Workforce Into the 21st Century - Report of the Committee of Inquiry Into Medical Education and Medical Workforce, Canberra, AGPS
- Gadiel D, Ridoutt L (1995), The Specialist Medical Workforce and Specialist Service Provision in Rural Areas - MWDRC Consultancies no. 1, Canberra, AGPS
- Harris M, Lee P (1992), Specialist Medical Services for Rural and Remote Australians, University of Wollongong
- Medical Workforce Data Review Committee (1995), Annual Report 1994, Canberra
- Medical Workforce Standing Advisory Committee (1995), Planning The Medical Workforce - Second Report, London
- van Konkelenberg, R (1996), Balancing Anaesthetic Supply Against Requirements, unpublished data collection