

Australian Medical Workforce Advisory Committee

# **THE GENERAL SURGERY WORKFORCE IN AUSTRALIA**

**SUPPLY AND REQUIREMENTS**

**1996 - 2007**

**AMWAC Report 1997.2**

**May 1997**

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## ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AHMAC	Australian Health Ministers' Advisory Council
AIHW	Australian Institute of Health and Welfare
AMWAC	Australian Medical Workforce Advisory Committee
AN-DRG	Australian National Diagnosis Related Groups
Aust	Australia
DHFS	Department of Health and Family Services (Commonwealth)
FRACS	Fellow of the Royal Australasian College of Surgeons
FTE	Full time equivalent
GI	Gastro-intestinal
MBS	Medicare Benefits Schedule
NSW	New South Wales
NT	Northern Territory
Pop	Population
Qld	Queensland
RACS	Royal Australasian College of Surgeons
RARA	Rural and Remote Areas
SA	South Australia
SPR	Surgeon:Population ratio
Tas	Tasmania
Terr	Territory
TRD	Temporary Resident Doctor
UK	United Kingdom
Vic	Victoria
VMO	Visiting Medical Officer
WA	Western Australia

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## **TERMS OF REFERENCE OF AMWAC AND THE AMWAC GENERAL SURGERY WORKFORCE WORKING PARTY**

The Australian Health Ministers' Advisory Council (AHMAC) established the Australian Medical Workforce Advisory Committee (AMWAC) to advise on national 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.

### AMWAC General Surgery Workforce Working Party Terms of Reference

The AMWAC General Surgery 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 general surgeons across Australia, including projections for future requirements.

The Working Party held its first meeting on June 1996 and the report was presented to the AMWAC meeting on 19 May 1997.

## **MEMBERSHIP OF AMWAC**

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## **INTRODUCTION, GUIDING PRINCIPLES AND METHODOLOGY**

### **Introduction**

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

The main objective of the Working Party has been to promote an optimal supply and appropriate distribution of general surgeons, including projections for future requirements to the year 2007.

### **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 general surgeons, appropriately distributed to provide the surgical services it requires;
- the community is best served when general surgeons have high standards of qualification and work with a high level of ongoing experience, matched by appropriate surgical facilities;
- the general surgery workforce must provide a range of individual practices from highly specialised to those covering the full spectrum of general surgery and making an interface with other surgical specialties;
- all Australian citizens must have access to a good standard of surgical 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; and
- both public and private sectors must provide an adequate amount and quality of service.

The Working Party defined a general/vascular surgeon as a qualified surgeon who is conducting surgical consultations, general surgery including vascular surgery, medico legal consultations on general/vascular surgery or is in a full time or part time academic position relating to general/vascular surgery. It will include salaried positions and private practice. It does not include any practitioner who is not registered as a specialist surgeon; nor does it include trainees or other registrars.

Vascular surgeons are included in the report as they undertake general surgery training and there is no vascular surgery training program independent of general surgery training.

### **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 general

surgery services.

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

1 Royal Australasian College of Surgeons (RACS)

The RACS keeps a variety of data, principally on the number, age, gender and location of Fellows, and data on training posts and trainees. To supplement this data the RACS and AMWAC conducted a survey of Fellows in September/October 1996. This survey had a 39% response rate and the results are summarised in Appendix B.

AMWAC also conducted a pseudo delphi analysis with 52 selected general surgeons to gain an insight into issues that could affect the future of the general surgery workforce and expected future requirements. The results of the pseudo delphi process are included in Appendix C.

2 Australian Institute of Health and Welfare (AIHW)

The principle AIHW data source is the annual Medical Labour Force Survey. The Medical 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 1994 (AIHW 1996). This survey had an apparent overall response rate of 89.8%.

3 Department of Health and Family Services (DHFS) 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 it does not provide data on practitioners who only provided services as salaried general surgeons in the public hospital system and who do not render services on a fee for service basis which attract Medicare benefits. So Medicare data excludes services rendered free of charge to public hospital patients, to Veterans' Affairs patients and to compensation cases.

It should also be noted that Medicare records services provided by general surgeons and non standard general surgeons. Non standard general surgeons have specialist recognition as specialist surgeons but they derive most of their Medicare income from areas of surgery other than their field of specialisation. The major Medicare items billed by non standard general surgeons are consultations and assistance at operations. As a result when assessing the trends in Medicare general surgical services reference is only

made to services provided by general surgeons.

#### 4 AHMAC and DHFS casemix report on hospital activity

Since August 1994, a national overview of hospital activity as measured by Australian National Diagnosis Related Groups (AN-DRGs) has been published. To date reports covering the years 1991-92, 1992-93, 1993-94 and 1994-95 have been issued. The first three reports only included information on activity in public hospitals. The 1994-95 report provides details on activity in both public and private hospitals.

AN-DRGs are a classification system of acute episodes in hospitals. Each DRG represents episodes of care for inpatients with similar clinical characteristics (for example diagnosis, procedure, age).

#### 5 AMWAC Public Hospital Specialist Vacancy Survey

AMWAC surveyed Australian public hospitals in October 1996 to obtain information on public hospital general surgery specialist vacancies for both consultants/visiting medical officers (VMOs) and salaried/staff specialists. A vacancy was defined as a position for which funding is available and for which active recruitment is being, or has been, undertaken. The survey also sought information on temporary resident doctors (TRDs) filling vacancies. This survey had a 95% response rate; the major non respondents were several large hospitals in New South Wales and Victoria.

#### 6 Australian Bureau of Statistics (ABS)

The Australian Bureau of Statistics (ABS) population data and population projections are used 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 and ABS 1997).

#### 7 Rural and Remote Area classification

Wherever possible, distributional data has been interpreted using the rural and remote area (RARA) classifications developed by the Commonwealth Department of Health and Family Services (DHS 1994). A summary of the RARA classification is provided in Appendix A.

### **Key Assumption**

The Working Party would like to emphasise that the projections on general surgery 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**

This report describes the current general surgery workforce, assesses the adequacy of that workforce, and projects workforce supply and requirements to 2007.

The report concludes that the workforce is currently adequately meeting requirements. The report also concludes that the current projected level of graduate output will not be sufficient to meet expected future requirements. It is estimated that requirements will grow by 1% per annum. In particular future supply will be affected by the large cohort of surgeons aged 55 years and over (38.7% of the workforce).

As a result minor increases in graduate output are recommended to move future supply into balance with expected requirements. This will require the establishment of 40 additional general surgery training positions by 2000.

### **Description of the Current General Surgery and Vascular Surgery Workforce**

The most significant features of the current workforce are the large number of general surgeons aged 55 years and over and the apparent shift that has been occurring in the way general surgery services are provided and the type of work being performed by general surgeons.

It would appear that two shifts are occurring in general surgical practice. First, for private procedures which attract Medicare benefits, general surgeons are performing more endoscopic work, more minor surgery and relatively less of the acknowledged general surgical procedures. Secondly, public hospital casemix data shows there has been a steady increase in general surgical activity, estimated at 3.5% per annum, at the same time as there has been very little annual growth in procedures that attract Medicare benefits and negative growth in selected procedures that attract Medicare benefits.

A significant number of general surgeons are located in rural areas (23.3% of the workforce) and as a result the distribution of general surgeons is comparatively better than most specialties. However, there is some maldistribution between States/Territories. Queensland, Western Australia, Tasmania and the Northern Territory all have surgeon to population ratios that are behind the Australian average.

#### *Number of Practising General/Vascular Surgeons*

- In 1996, there were 1072 general surgeon RACS Fellows and 153 vascular surgeon RACS Fellows, a total of 1225 Fellows.
- DHFS data on surgeons who had billed Medicare in 1995-96 identified 959 general surgeons and 116 vascular surgeons, a total of 1075.
- The 1994 AIHW Medical Labour Force Survey identified 1079 general surgeons

and 69 vascular surgeons practising direct patient care, a total of 1148.

- The soon to be published 1995 AIHW Medical Labour Force Survey identified:
  - 1135 specialists with a qualification in general surgery and 149 with a qualification in vascular surgery, a total of 1284;
  - 1039 specialists practising general surgery and 139 practising vascular surgery, a total of 1178.

#### *Surgeons to Population*

- Using RACS data the surgeon to population ration (SPR) for general and vascular surgeons combined is 1:14,930 and 6.7 surgeons per 100,000 population. Using Medicare (standard general surgeons and vascular surgeons) data the SPR is 1:17,012 and 5.9 surgeons per 100,000 population.
- Comparison of the State/Territory surgeon to population ratios (SPRs) for both RACS and Medicare data show that New South Wales and Victoria are marginally more generously populated with general surgeons than the national average. Queensland, Western Australia and Tasmania have a little less than average in their surgeon numbers and at the margins South Australia has the highest SPR and the Northern Territory the lowest.
- Whilst there is not yet a vascular surgeon in the Northern Territory, the distribution of vascular surgeons in other States/Territories shows reasonable matching with the population. New South Wales, Victoria and South Australia are slightly better than the average SPR and Queensland and Western Australia are slightly behind the average.

#### *Geographic Distribution*

- The 1994 AIHW labour force survey indicated that 23.3% of general surgeons were located in a rural/remote area (21.5% rural and 1.6% remote). The majority of rural practitioners were located in major rural communities.
- In 1994, 68.9% of general surgeons were located in a capital city (63.5% of population) and 9% (8.2% of population) of general surgeons were located in other major urban areas.
- Data from the RACS/AMWAC survey of surgeons indicated that of the 379 urban respondents, 53 (14%) provided outreach services to rural areas.

#### *Age Profile*

- RACS data shows that the largest ten years age cohort is 45-54 years (33.9%). Significantly, 38.7% of the general surgery workforce is aged over 55 years and 13.3% is aged over 65 years.
- The vascular surgery workforce is comparatively younger with AIHW data showing

that 81.2% of the workforce is aged under 55 years.

### *Gender Profile*

- The 1994 AIHW survey data indicated that women numbered 3.1% of general surgeons, compared to 3.2% of all surgeons and 14% of specialists. In the same year females made up 25.6% of all clinicians. 3.6% of RACS general/vascular surgeons are female.
- The number of female general surgeons varies considerably across States/Territories. The majority are located in New South Wales and Victoria, there are several female general surgeons in Queensland and none in Western Australia, the Northern Territory and the Australian Capital Territory. There are no female vascular surgeons.
- Female general surgeons tended to be younger than their male counterparts, with 65.6% under 44 years (compared to only 21% of male general surgeons).
- 13.6% of general surgical trainees are female.

### *Hours Worked*

- The AIHW data showed that, in 1994, 83.6% of general surgeons worked 40 hours per week or more (excluding work on call); and that the majority (57.5%) worked between 51 and 70 hours per week; 14.3% worked more than 70 hours per week; and 5.7% worked 20 hours per week or less.
- Almost half of all general surgeons worked an average of more than 60 hours per week in total in 1994. 7.7% reported working more than 80 hours a week. Males were more likely than females to be working the longer hours, with 7.5% reportedly working over 80 hours, and a further 5.9% of males working between 71 and 80 hours a week. No female general surgeon reported working over 70 hours a week in total.
- In 1994, general surgeons spent an average of 51.2 hours per week on the direct care of patients, compared to the average for all specialists of 46.5 hours.
- In 1994, general surgeons aged 40 to 44 years worked the longest average hours per week, with an average of 61.2 hours. General surgeons aged between 30 and 60 years worked, on average, in excess of 55 hours per week.
- There was little difference in the hours worked by urban and rural surgeons; however general surgeons in rural and remote locations spend a longer than average time per week on call than their urban counterparts.
- The AIHW survey data indicates that in 1994, 75.9% of general surgeons were

working in their main job in private medical practitioners rooms or surgeries, and a further 17.7% were working in their main job in public acute care hospitals. The RACS/AMWAC survey indicated that 81% of respondents had access to a public hospital.

#### *General Surgery Services Attracting Medicare Benefits*

- The average number of services provided that attracted Medicare benefits in 1995-96 by general surgeons was 2,205 and for vascular surgeons was 1,825.
- The total number of services attracting Medicare benefits provided by general surgeons increased by 14.1% over the period 1990-91 to 1995-96. The total number of vascular surgery services provided increased by 33.9% over the same period.
- The most common Medicare Benefits Schedule (MBS) items provided by both general and vascular surgeons in 1995-96 were specialist consultations (MBS items 105 and 104). When the totals for these items are excluded, the increases in services provided by general and vascular surgeons, over the past five years, were 1.5% and 62.3%, respectively.
- Medicare items that have shown a large increase are colonoscopies, deep tumour removals and malignant skin tumour removals and upper GI endoscopies.
- There has been a shift occurring in the work performed by general surgeons. This trend is confirmed by examination of selected groups of Medicare items that show that whilst general surgeon consultations, endoscopic work and minor procedures have risen considerably, the involvement of general surgeons in their acknowledged operative work has decreased, if not since 1984-85, certainly since 1990-91. These trends are summarised in considerable detail in Appendix D. The operations examined and the MBS items included in the analysis were considered by the Working Party to be indicative of the operative work performed by general surgeons.
- General surgery operations attracting Medicare benefits have declined in most of the selected categories over the past five years with an overall decline of 8.9% (1.78% per annum). In some areas the reduction has been due to apparent change in disease incidence (appendix) and in others it has been due to other therapeutic interventions (gastric). In many areas the shift will have been from Medicare to public hospital free patient services.
- The trend in selected vascular surgery procedures attracting Medicare benefits is similar where activity has declined by 3.2% (0.64% per annum).
- 30.8% of Medicare services provided by general surgeons were direct billed. This

level of direct billing by general surgeons was one of the highest proportions of direct billing of all surgeons.

#### *Public Hospital Casemix Services*

- Public hospital procedures, classified by AN-DRGs, and predominantly performed by general/vascular surgeons were selected to analyse the trends in public hospital general and vascular surgery.
- For all the selected procedures, except appendectomy, the number performed are increasing. The total increase for the selected procedures between 1991-92 and 1994-95 was 14.2% (3.5% per annum). The largest increases have been in anal, breast and gall bladder procedures. During the same period the Australian population increased by 3.2%, so the increase has been in excess of population growth.
- Selected AN-DRG vascular procedures have decreased by 3% per annum.

#### *Training Arrangements*

- The RACS training program in general surgery can commence after the intern year. The Part I program involves surgical rotations for two years. After successful completion of Part I (basic) training, trainees are eligible to proceed to Part II (advanced) training. Part II trainees enter for a four year training program.
- As at June 1996, there were 176 approved general surgery advanced training positions. There are no training programs based in the Northern Territory but two trainees rotate to the Northern Territory.
- Compared to population, Victoria has a proportionately higher number of training positions, whilst New South Wales, Western Australia and South Australia have proportionately less. The number of training positions in Queensland is in line with population.
- Between 1989 to 1996 there was a 39% increase in trainee numbers. This varied considerably between States/Territories with a 100% increase in Western Australia and an 18.2% increase in trainees in South Australia. The increase in Western Australia was necessary to bring that States trainee numbers to a level appropriate to its population. The lower increase in trainees in South Australia was necessary to address the relatively high SPR in that State.

## **Adequacy of the Current Workforce**

The Working Party concluded that the present general/vascular surgery workforce is adequately meeting current requirements. None of the indicators chosen by the Working Party pointed to shortages. Nationally, the SPR has been reasonably constant over the past twelve years; public hospital vacancies are extremely low; none of the major waiting time indicators are excessively high and, in general, there was high degree of satisfaction with workloads.

SPRs indicate that Queensland, Western Australia and Tasmania remain above the Australian SPR, which shows that these States could require proportionately more general surgeons. This is the same for Northern Territory and Australian Capital Territory which are significantly above the Australian level. Similarly, elective surgery waiting times for an urgent condition are a little higher in Queensland and Tasmania than other States and first consultation waiting times for a major procedure are higher in Western Australia and Tasmania. However, overall the Working Party considered these factors to be indicative of some maldistribution problems within the workforce, rather than any significant shortage in the workforce as a whole.

### *Surgeon to Population Benchmarks*

- Examination of the available literature shows that no clear-cut benchmark for general surgery has been defined.
- Medicare data shows that the Australian SPR has remained fairly constant over the past 12 years.

### *Public Hospital Vacancies*

- The AMWAC survey of public hospital specialist vacancies found there were ten general surgery vacancies and only one vascular surgery vacancy. This would represent a combined vacancy rate of 1%.
- There were four vacancies in New South Wales and three in Victoria, two in Queensland and one in Western Australia. Seven of the vacancies were in rural areas. There were no TRDs filling general surgery or vascular surgery vacancies.

### *Consultation Waiting Times*

- The RACS/AMWAC survey of surgeons collected information on surgeon consultation waiting times. The results reveal that in general private patients are more expediently dealt with. The waiting times for an urgent condition are appropriately short. The waiting times for a disabling condition are too long in the public hospital system in Western Australia and Tasmania.

### *Surgeons Workload*

- In the RACS/AMWAC survey of surgeons, 68% of respondents indicated they were satisfied with their workload, 25% felt they were over worked but only 10%

felt that more general surgeons were required in their geographic area. In response to the question on capacity to increase workload, 38% of surgeons indicated they had time available to increase their operating time and 30% indicated time available to increase their consultative work.

## **Projections of Requirements and Supply**

### *Requirements Trends*

- Over the next ten years the Australian population is estimated to grow by 1.2% per annum.
- The two sets of services data examined - Medicare and public hospital AN-DRGs - show that there has been a 14.2% increase in public hospital general surgery services between 1991-92 and 1994-95, equivalent to a growth of 3.5% per annum; and an 8.9% decrease in selected general surgery services attracting Medicare benefits between 1991-92 and 1995-96, equivalent to a fall of 1.8% per annum.
- Recognising that the data sets are not mutually exclusive and as such it is not possible to absolutely match the two sets of data, it would appear that there has been something like a 1-1.7% per annum increase in general surgery services occurring over the past five years.
- Respondents to the pseudo delphi analysis estimated that the general surgery workforce would need to increase by 2.6% per annum to meet future requirements.

### *Supply Trends*

- The Working Party estimates that, on average, in each of the next three years 42 new general surgeons will enter the workforce.
- A sizeable number of general/vascular surgeons can be expected to leave the workforce over the next ten years. There are currently 474 general/vascular surgeons aged 55 years and over, representing 38.7% of the workforce. If all of these surgeons retired over the next ten years this would represent an average loss of 47 surgeons per year.
- Medicare data indicates there are 219 general/vascular surgeons aged over 60 years of age. If all of these surgeons retire over the next five years this would represent an average loss of 44 surgeons per year.
- It is expected that the proportion of women in general surgery will increase both because of an expected increase in the number of female trainees and as the 55 years and over cohort of general/vascular surgeons retire. Currently, women

represent 3.1% of the current general surgery workforce but 13.6% trainees and there are no female surgeons in the 55 years and over age cohort.

- Specialist general/vascular surgeons entering the Australian workforce through the Australian Medical Council specialist college pathway are expected to be small and to have a minimal effect on overall workforce supply.
- Despite the comparatively encouraging figures for the provision of services to rural areas, the Working Party believes young general surgeons still need to be encouraged to consider rural practice; and rural training opportunities need to continue and be expanded where appropriate.

#### *Balancing Projected Supply With Projected Requirements*

- The Working Party considered that the recently observed trends in services growth are likely to continue and as a result, it is estimated that requirements will grow at 1% per annum.
- The supply of general/vascular surgeons was projected by ageing the 1996 supply through each year of age, subtracting retirements and adding 42 new graduates per year to 2001 and 52 in subsequent years. In particular the supply trends over the next ten years will be dominated by the large cohort of surgeons aged 55 years and over and their progression through to retirement.
- A balance in supply to match a continued growth rate in requirements of 1% per annum can be achieved by increasing the proposed number of graduates of the general surgery training program in 2002 from the current level of 42 per year to 52 per year.
- If the target of 52 graduates is desired an additional 40 general surgery advanced training positions would be required.
- This is a large increase in training positions in a year and unlikely to be practical, although the RACS increased training positions by 21 in 1994. Therefore, the Working Party recommends a staged increase in training positions of 16 in 1998, 16 in 1999 and 8 in 2000.
- In terms of ability to effect increases in training positions, the staged scenario is preferable. It will also enable the projected trend in requirements to be monitored and the recommended increases in training positions adjusted if necessary.
- Training positions should be increased proportionately less in the comparatively well endowed States of South Australia and Victoria and kept roughly in line with projected State/Territory population shares in 2006. In particular, emphasis needs to be given to increasing positions in Queensland and Western Australia as a

priority. Increases in training positions in the Victoria/Tasmania program should be made in Tasmania initially.

## RECOMMENDATIONS

The Working Party recommends:

1. There be an increase in the number of funded general surgery training positions and trainees to match an expected future growth in requirements of 1% per year.
2. That State and Territory health departments undertake negotiations with the RACS for the establishment of 40 additional general surgery training positions; with the increases to be staged and distributed as shown in the following table:

**Total and additional general surgery training positions; by State/Territory, 1996 to 2000**

State/Territory	Total 1996 (current)	Total 2000	Increase in 1998	Increase in 1999	Increase in 2000
NSW/ACT	58	75	7	7	3
Victoria/Tasmania	58	62	1	2	1
Queensland	32	43	5	5	1
SA/NT	13	15	1	0	1
Western Australia	15	21	2	2	2
<b>AUSTRALIA</b>	<b>176</b>	<b>216</b>	<b>16</b>	<b>16</b>	<b>8</b>

3. State/Territory based general/vascular surgery services working groups, comprising RACS and State/Territory department of health representatives, be organised to co-ordinate the establishment of the new training positions and to oversee the introduction of any short term measures they may feel are necessary to meet localised service shortfalls (recognising that the increased number of graduates will not make an effective contribution to the general surgery workforce until 2002).
4. That general/vascular surgery requirements and supply projections be monitored regularly so that they can be amended if new trends emerge.
5. That this monitoring be coordinated by the RACS and AMWAC and the results incorporated into the AMWAC annual report to AHMAC. AMWAC will provide all necessary support.

## **DESCRIPTION OF THE CURRENT GENERAL SURGERY WORKFORCE**

As discussed in the Introduction, there are a variety of data sources on the numbers, attributes and distribution of general surgeons 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 general surgery workforce the Working Party defined:

- the number of general surgeons and vascular surgeons;
- their distribution by State/Territory and geographic location using the RARA classification;
- the age and gender profiles of the workforce;
- the hours worked; and
- the services provided and performed.

### **The Number of Practising General and Vascular Surgeons in Australia**

The data sources used are the records of the RACS, the AIHW medical labour force survey and the DHFS Medicare data base.

The RACS data base records the qualifying diploma - FRACS (General Surgery) - and records membership of the Divisions of General Surgery and Vascular Surgery. The data base also records surgeons main stated area of activity and whether retired. These latter statements allow resolution of the known, not infrequent, discrepancy between speciality of qualification and the area of practice. Surgeon by surgeon reconciliation of these two RACS lists allowed a conclusion that in 1996 there were 1072 General Surgeon Fellows and 153 Vascular Surgeon Fellows; a total of 1225.

Membership of the Division of Vascular Surgery of the RACS numbers 153. The appropriateness of this membership list as a representation of the vascular surgery workforce has been cross-checked against the RACS database on surgeons to ensure that there was no double counting with members of the Division of General Surgery.

A RACS rural survey of 1993 revealed 28 specialist general surgeons in active practice who were not FRACS. This is an incomplete recording of non FRACS surgeons but it gives some indicator of the likely numbers in this category.

DHFS data on surgeons who had billed Medicare in 1995-96 identified 1187 general surgeons and 116 vascular surgeons; a total of 1302. Included in the general surgeons total are 227 non standard general surgeons. A non standard general surgeon, under Medicare, is a practitioner with specialist recognition as a specialist surgeon but have most of their Medicare income from areas of surgery other than their field of specialisation. The major Medicare items billed by non standard general surgeons are

consultations and assistance at operations.

The 1994 AIHW Medical Labour Force Survey identified 1079 general surgeons and 69 vascular surgeons practising direct clinical care; a total of 1148. The AIHW survey provides information on practitioners who report that they were specialists with a principal qualification in general or vascular surgery and that they conducted direct patient care in those areas. These AIHW numbers of general and vascular surgeons represent 45.9% of all surgeons and 7.4% of all specialists.

The recently published 1995 AIHW Medical Labour Force Survey identified:

- 1135 specialists with a qualification in general surgery and 149 with a qualification in vascular surgery;
- 1039 specialists practising general surgery and 139 practising vascular surgery. Of these 971 had general surgery and 122 vascular surgery as the main specialty of practice, a total of 1093.

The Working Party believes that the considerable data set variation in the number of vascular surgeons reflects the changing categorisation of vascular surgeons into a defined Division within the RACS in 1995.

The data from these three sources is summarised in Table 1.

**Table 1: Number of general surgeons and vascular surgeons (various sources), selected years**

Surgeons	RACS (1996)	AIHW (1994)	AIHW (1995 - qualified)	AIHW (1995 - practising)	Medicare (1995-96)
General	1072	1079	1135	971	959
Vascular	153	69	149	122	116
<b>Total</b>	<b>1225</b>	<b>1148</b>	<b>1283</b>	<b>1092</b>	<b>1075<sup>a</sup></b>

a - excluding 227 non standard general surgeons

Source: RACS, AIHW and DHFS

### **Growth in the General and Vascular Surgery Workforce**

Tables 2 and 3 give some idea of the growth in the general/vascular surgery workforce. The RACS Divisions of General and Vascular Surgery have had a growth of 18.6% in their membership in the past four years. The AIHW survey indicates a growth in the number of general and vascular surgeons of 15.7% in two years.

**Table 2: Growth in the general/vascular surgery workforces (various sources), selected years 1991-92 to 1995-96**

Year	RACS	AIHW	Medicare
1991-92 (AIHW 1992-93)	1033	992	944
1995-96 (AIHW 1994)	1225	1148	1075
% increase	18.6	15.7	13.9

Source: RACS, AIHW and DHFS

Some idea of the growth in the general surgery workforce across States and Territories can be gained from Table 3, using Medicare data. Medicare data do not reveal the complete workforce but the inclusion criteria are constant and therefore provide an indication of the magnitude of the growth in the workforce. Since 1984-85 the general/vascular surgery workforce has increased by 33.9%. Population growth during this same period was 17.4%. In all States the growth in the workforce has exceeded population growth. This was not the case in the Northern Territory and the Australian Capital Territory. The largest percentage increases in the number of general surgeons have been in Queensland and Tasmania.

**Table 3: General/vascular surgeons (Medicare); by State /Territory, 1984-85 and 1995-96**

Year	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	Aust
1984-85	279	245	108	76	62	17	9	5	803
1995-96	368	295	171	108	90	27	10	6	1075
% increase	31.9	20.4	58.3	42.1	45.2	58.8	11.1	20.0	33.9
% pop. Increase	14.6	11.4	32.9	8.8	26.7	9.9	24.1	22.4	17.4

Source: DHFS and ABS

### **Distribution of the General Surgery and Vascular Surgery Workforce**

Tables 4 and 5 provide information on the current distribution of general surgeons and vascular surgeons between States and Territories and surgeon to population details.

Comparison of State/Territory surgeon to population ratios (SPRs) for both RACS and Medicare data shows that New South Wales and Victoria are marginally more generously populated with general surgeons than the national average. Queensland, Western Australia and Tasmania have a little less than average in their surgeon numbers and at the margins South Australia has the highest SPR and the Northern Territory the lowest (Table 4).

Table 5 shows similar information but for vascular surgeons only. Whilst, there is not yet

a vascular surgeon in the Northern Territory, the distribution of surgeons in other States/Territories shows reasonable matching with the population. New South Wales, Victoria and South Australia are slightly better than the average SPR and Queensland and Western Australia are slightly behind the average.

**Table 4: General/vascular surgeons and surgeon:population (RACS and Medicare data); by State/Territory, 1995-96**

State/Terr.	Number of general/vascular surgeons	% of total general/vascular surgeons	% of Australian population	SPR	Surgeons per 100,000 population
<b>RACS</b>					
NSW/ACT	460	37.6	35.6	1:14,125	7.08
Victoria	322	26.3	24.8	1:14,102	7.09
Queensland	189	15.4	18.3	1:17,750	5.63
South Aust.	121	9.9	8.1	1:12,225	8.18
West. Aust.	96	7.8	9.7	1:18,360	5.45
Tasmania	29	2.4	2.4	1:16,334	6.12
North. Terr.	8	0.6	1.0	1:22,138	4.52
<b>Australia</b>	<b>1225</b>	<b>100.0</b>	<b>100.0</b>	<b>1:14,930</b>	<b>6.70</b>
<b>Medicare (standard surgeons)</b>					
NSW/ACT	378	35.2	35.6	1:17,190	5.82
Victoria	295	27.4	24.8	1:15,393	6.50
Queensland	171	15.9	18.3	1:19,618	5.10
South Aust.	108	10.0	8.1	1:13,696	7.30
West. Aust.	90	8.4	9.7	1:19,585	5.11
Tasmania	27	2.5	2.4	1:17,544	5.70
North Terr.	6	0.6	1.0	1:29,517	3.39
<b>Australia</b>	<b>1075</b>	<b>100.0</b>	<b>100.0</b>	<b>1:17,012</b>	<b>5.88</b>

The population figures used are estimates for 1995-96.

Source: RACS, DHFS and ABS

**Table 5: Vascular surgeons and surgeon:population (RACS and Medicare data); by State/Territory, 1995-96**

State/Terr.	Number of vascular surgeons	% of total vascular surgeons	% of Australian population	SPR	Surgeons per 100,000 population
<b>RACS</b>					
NSW/ACT	57	37.3	35.6	1:113,995	0.88
Victoria	43	28.1	24.8	1:105,605	0.95
Queensland	23	15.0	18.3	1:145,857	0.69
South Aust.	13	8.5	8.1	1:113,785	0.88
West. Aust.	13	8.5	9.7	1:135,592	0.74
Tasmania	4	2.6	2.4	1:118,425	0.84
North Terr.	0	0.0	1.0	-	-
<b>Australia</b>	<b>153</b>	<b>100.0</b>	<b>100.0</b>	<b>1:119,537</b>	<b>0.84</b>
<b>Medicare</b>					
NSW/ACT	38	32.8	35.6	1:170,992	0.58
Victoria	31	26.7	24.8	1:146,484	0.68
Queensland	21	18.1	18.3	1:159,748	0.63
South Aust.	12	10.3	8.1	1:123,267	0.81
West. Aust.	11	9.5	9.7	1:160,245	0.62
Tasmania	3	2.6	2.4	1:157,900	0.63
North Terr.	0	0.0	1.0	-	-
<b>Australia</b>	<b>116</b>	<b>100.0</b>	<b>100.0</b>	<b>1:157,665</b>	<b>0.63</b>

The population figures are estimates for 1995-96.

Source: RACS, DHFS and ABS

Table 6, using Medicare data, outlines the distribution of general surgeons by geographic location using the RARA classification. It shows that 71.1% of general surgeons had their primary residence in a capital city (63.5% of population), 6.3% in other major urban areas (8.2% of population), and the remaining 22.6% in rural/remote areas (28.3% of population).

The AIHW labour force survey indicated that 23.3% of general surgeons were located in a rural/remote area (21.5% rural and 1.6% remote). The majority of rural surgeons (77%) were located in major rural communities (Table 8).

Table 7 details the geographic distribution of vascular surgeons - 83.6% are located in a capital city, 7.8% in an other major urban area and 8.6% in a rural area. The AIHW survey found that 4% of vascular surgeons were located in rural areas. All rural vascular surgeons are located in major rural centres (Table 8).

**Table 6: Distribution of general surgeons (Medicare data); by State/Territory and geographic location, 1995-96**

State	Total		Capital city		Other major urban		Rural/remote	
	No.	%	No.	%	No.	%	No.	%
NSW	330	34.4	225	68.2	30	9.1	75	22.7
Vic	264	27.5	203	76.9	12	3.5	49	18.6
Qld	150	15.6	79	52.7	18	12.0	53	35.3
SA	96	10.0	86	89.6	..	..	10	10.4
WA	79	8.2	62	78.5	..	..	17	21.5
Tas	24	2.5	13	54.2	..	..	11	45.8
ACT	10	1.0	10	100.0	..	..	0	0.0
NT	6	0.6	4	66.7	..	..	2	33.3
<b>Aust</b>	<b>959</b>	<b>100.0</b>	<b>682</b>	<b>71.1</b>	<b>60</b>	<b>6.3</b>	<b>217</b>	<b>22.6</b>

.. - not applicable

Source: DHFS

**Table 7: Distribution of vascular surgeons (Medicare data); by State/Territory and geographic location, 1995-96**

State	Total		Capital city		Other major urban		Rural/remote	
	no.	%	no.	%	no.	%	no.	%
NSW	36	31.0	27	75.0	5	13.9	4	11.1
Victoria	31	26.7	28	90.3	1	3.3	2	6.4
Qld	21	18.1	15	71.4	3	14.3	3	14.3
SA	12	10.3	12	100.0	..	..	0	0.0
WA	11	9.5	11	100.0	..	..	0	0.0
Tas	3	2.8	2	66.7	..	..	1	33.3
ACT	2	1.8	2	100.0	..	..	0	0.0
NT	0	0.0	0.0	0.0	..	..	0	0.0
<b>Aust</b>	<b>116</b>	<b>100.0</b>	<b>97</b>	<b>83.6</b>	<b>9</b>	<b>7.8</b>	<b>10</b>	<b>8.6</b>

.. - not applicable; Source: DHFS

**Table 8: Distribution of general surgeons and vascular surgeons (AIHW data); by geographic location, 1994**

Surgeons	Capital city	Other major urban	Rural major	Rural other	Remote major	Remote other	Total	%rural/remote
General	735	95	194	39	15	3	1082	23.3
Vascular	62	9	3	0	0	0	75	4.0
%	68.9	9.0	17.0	3.4	1.3	0.3	100.0	22.0

Source: AIHW

The requirements for a safe sustainable general surgical practice are the support of other specialty colleagues (most notably anaesthetists), appropriate hospital facilities and diagnostic and other ancillary support. Adequate ongoing experience of the surgeon is required to maintain surgical standards. These considerations impose a limitation on how widely in the rural community surgeons can be spread.

Recognising that some services to rural and remote areas are provided on an outreach basis by urban specialists, the Working Party included a question on this in the AMWAC/RACS survey of Fellows of the Divisions of General and Vascular Surgery. The survey revealed that of the 379 urban respondents, 53 (14%) travelled to rural or remote centres to provide surgical services. The 53 respondents averaged 4.4 hours of rural outreach work per week.

Table 9 provides information on the location of general surgeons based on their country of initial qualification. An estimated 84% of specialists qualified in general surgery and working in Australia in 1994 obtained their initial qualification in Australia. A further 6.3% obtained it in the United Kingdom/Ireland and 6.4% in Asia. Those general surgeons located in capital cities and other major urban areas were more likely to have obtained their initial qualification in Australia than those located in rural and remote locations (86.4% for capital cities and 77.4% for rural and remote areas).

**Table 9: Specialists with a principal qualification in general surgery; by country of initial medical qualification, 1994**

Initial qualification from:	Capital city	Other major urban	Rural/Remote	Total
Australia	86.4	83.3	77.4	84.0
New Zealand	0.6	1.7	1.3	0.9
Europe	0.4	1.6	0.6	0.5
United Kingdom/Ireland	4.5	6.7	11.9	6.3
Northern Africa	0.6	0.0	0.6	0.6
South Africa	1.5	0.0	0.6	1.3
Asia	5.3	6.7	7.5	6.4
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: AIHW

### Age Profile

Tables 10 and 11 provide a summary of the Medicare age data for general surgeons. Table 10 shows that 39.9% of general surgeons are aged under 50 years and 24.0% are aged over 60 years. Significantly, 36.1% are aged 50 to 59 years, indicating there may be a sizeable number of specialists leaving the workforce over the next ten years or so. Tasmania appears to have a particularly old workforce, with nearly half of the workforce aged over 60 years.

The age profile of the workforce varies considerably across States and Territories. For surgeons aged under 50 years the range is from 19% of general surgeons in Tasmania to 57.1% in the Northern Territory, and for general surgeons aged 60 years and over the range is from 20% in Queensland to 47.6% in Tasmania.

**Table 10: Age profile of general surgeons (Medicare data); by State/Territory and major age category, 1995-96**

Age	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	Aust
% under 50 years	39.9	36.9	39.3	47.6	32.9	19.0	30.0	57.1	39.9
% 50-59 years	36.9	38.0	40.7	26.7	39.5	33.3	40.0	14.3	36.1
% over 60 years	23.1	25.1	20.0	25.7	27.6	47.6	30.0	28.6	24.0

Source: DHFS

**Table 11: Age profile of general surgeons (Medicare data); by State/Territory and gender, 1995-96**

State/Terr.	30-39 yrs	40-49 yrs	50-59 yrs	60 + yrs	Total
NSW	38	90	126	72	330
Victoria	32	69	106	56	264
Queensland	17	42	58	33	150
South Australia	11	32	27	26	96
Western Australia	8	19	30	19	79
Tasmania	2	6	7	9	24
ACT	0	3	3	4	10
Northern Territory	0	2	3	1	6
<b>Australia</b>	<b>108</b>	<b>263</b>	<b>360</b>	<b>219</b>	<b>959</b>
% of total	11.4	27.6	37.9	23.1	100.0

The total includes seven general surgeons of unknown age.

Source: DHFS

Tables 12 and 13 provide a summary of Medicare data on vascular surgeons by major age categories and shows that 45.7% of vascular surgeons are aged under 50 years and 20.6% are aged over 60 years. Compared to the general surgery workforce, vascular surgery is younger with a much higher proportion of surgeons aged under 50 years and a comparatively lower proportion aged over 60 years. New South Wales and Queensland in particular have a particularly young vascular surgery workforce with nearly half of the workforce aged under 50 years.

**Table 12: Age profile of vascular surgeons (Medicare data); by State/Territory, 1995-96**

State/Terr.	30-39 years	40-49 years	50-59 years	60 years & over	Total
NSW	5	12	13	6	36
Victoria	4	9	10	8	31
Queensland	*	7	6	5	21
South Aust.	*	5	4	*	12
West Aust.	0	4	4	*	11
Tasmania	*	*	*	0	3
ACT	0	*	*	0	*
North Terr.	0	0	0	0	0
<b>Australia</b>	<b>14</b>	<b>39</b>	<b>39</b>	<b>22</b>	<b>116</b>

\* - number less than 3.

Source: DHFS

**Table 13: Age profile of vascular surgeons (Medicare data); by State/Territory and major age category, 1995-96**

Age	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	Aust
% under 50 years	48.6	43.3	47.6	33.3	36.4	..	..	0.0	45.7
% 50-59 years	37.1	33.3	28.6	41.7	36.4	..	..	0.0	33.7
% over 60 years	14.3	23.4	23.8	..	..	..	..	0.0	20.6

.. not available due to numbers being less than 3.

Source: DHFS

**Table 14: RACS general/ vascular surgeons, non retired, by major age group and State/Territory, 1996**

State/Terr.	< 35 years	35-44 years	45-54 years	55-64 years	65 years and over	age not given	Total
<b>Number</b>							
NSW/ACT	25	99	156	114	63	3	<b>460</b>
Victoria	16	62	118	84	41	1	<b>322</b>
Qld	13	46	59	52	19	-	<b>189</b>
SA	6	28	38	34	15	-	<b>121</b>
WA	4	23	31	26	11	1	<b>96</b>
Tasmania	2	4	12	4	7	-	<b>29</b>
NT	-	3	1	2	2	-	<b>8</b>
<b>Australia</b>	<b>66</b>	<b>265</b>	<b>415</b>	<b>316</b>	<b>158</b>	<b>5</b>	<b>1225</b>
<b>%</b>							
NSW/ACT	5.4	21.6	33.9	24.8	13.7	-	<b>37.6</b>
Victoria	5.0	19.6	36.6	26.1	12.7	-	<b>26.3</b>
Qld	6.9	24.3	31.2	27.5	10.1	-	<b>15.4</b>
SA	5.0	23.1	31.4	28.1	12.4	-	<b>9.9</b>
WA	4.2	24.0	32.3	27.1	11.5	-	<b>7.8</b>
Tasmania	6.9	13.8	41.4	13.8	24.1	-	<b>2.4</b>
NT	-	37.5	12.5	25.0	25.0	-	<b>0.6</b>
<b>%</b>	<b>5.4</b>	<b>21.6</b>	<b>33.9</b>	<b>25.8</b>	<b>12.9</b>	<b>0.4</b>	<b>100.0</b>

Source: RACS

The RACS and AIHW figures are grouped into different age categories. Table 14, using RACS data, shows that for both general and vascular surgeons 33.9% of Fellows are aged in the 45-54 age group and that 38.7% of Fellows are aged over 55 years.

The AIHW age figures are very similar to the RACS figures. Table 15 shows that 39.3% of general surgeons are aged 45-54 years and 38.4% are aged over 55 years. The highest age group for vascular surgeons is the 35-44 years with 43.5% of the workforce; 21.7% of the workforce is aged over 55 years.

**Table 15: General surgery specialists (AIHW data); by gender and age, 1994**

<b>General surgery</b>	<b>25-34 years</b>	<b>35-44 years</b>	<b>45-54 years</b>	<b>55-64 years</b>	<b>65-74 years</b>	<b>75 + years</b>	<b>Total</b>	<b>% &lt;45 years</b>	<b>% &gt;65 years</b>
Male	20	200	413	279	115	20	1047	21.0	12.9
Female	4	17	11	0	0	0	32	65.0	0.0
%	2.2	20.1	39.3	25.9	10.6	1.9	100.0	-	-

Source: AIHW

**Table 16: Vascular surgery specialists (AIHW data); by gender and age, 1994**

<b>Vascular surgery</b>	<b>25-34 years</b>	<b>35-44 years</b>	<b>45-54 years</b>	<b>55-64 years</b>	<b>65-74 years</b>	<b>75 + years</b>	<b>Total</b>	<b>% &lt;45 years</b>	<b>% &gt;65 years</b>
Male	2	30	24	8	5	2	69	44.9	9.1
Female	0	0	0	0	0	0	0	0.0	0.0
%	2.9	43.5	34.8	11.6	7.2	2.9	100.0	-	-

Source: AIHW

Table 17 provides age information by geographic location and shows a fairly even distribution, with slightly higher proportions of younger and older surgeons practising in capital cities.

**Table 17: Distribution of general surgeons (Medicare data); by geographic location and age, 1994-95**

<b>Age group</b>	<b>Capital city</b>		<b>Other major urban</b>		<b>Rural/Remote</b>		<b>Total</b>
	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>
30 to 39 years	75	72.8	6	5.8	22	21.4	103
40 to 49 years	188	66.0	32	11.2	65	22.8	285
50 to 59 years	237	67.9	32	9.2	80	22.9	349
60 + years	175	75.1	22	9.4	36	15.5	233
<b>Total</b>	<b>675</b>	<b>69.6</b>	<b>92</b>	<b>9.5</b>	<b>203</b>	<b>20.9</b>	<b>970</b>

Source: DHFS

## **Gender Profile**

The 1994 AIHW survey data indicated that women numbered 3.1% of general surgeons, compared to 3.2% of all surgeons and 14% of specialists. In the same year females made up 25.6% of all clinicians. 3.6% of RACS general/vascular surgeons are female.

The number of female general surgeons varies considerably across States/Territories. The majority are located in New South Wales and Victoria; there are several female general surgeons in Queensland and none in Western Australia, the Northern Territory and the Australian Capital Territory. There are no female vascular surgeons.

Female general surgeons tended to be younger than their male counterparts, with 65.6% under 44 years (compared to only 21% of male general surgeons).

13.6% of general surgical trainees are female. This trend should mean that the female share of general surgery overall will rise in the future, although the extent of this will be reliant on the number of females who apply for, and are accepted into, general surgery training positions in future years.

A Women in Surgery Committee was established by the RACS Council in 1990 to work on aspects of recruitment, training and professional activities of RACS that might differentially affect women. The RACS also has a policy to allow interrupted and part time training.

## **Hours Worked**

### *Participation*

The level of active supply is affected by the participation rate of practitioners, in terms of their full time and part time status. General surgeons working different hours can be converted to a standard estimate of productivity defined as number of hours provided.

Table 18 details the estimated average hours worked per week by percentage of males and females; direct care hours; total hours; and on call hours. This information comes from the AIHW Health Labour Force Survey, 1994. 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 a Medicare income cut off point, which would not pick up on work in a public hospital. Survey data on total hours worked was considered a more accurate indication of participation.

The information in Table 18 shows that of the respondents to the AIHW survey:

- 83.6% worked over 40 hours per week, excluding on call;
- the majority (57.5%) worked between 51 and 70 hours per week;
- 14.3% worked more than 70 hours per week; and
- 5.7% worked 20 hours per week or less.

Almost half of all general surgeons worked an average of more than 60 hours per week

in total in 1994. 7.7% reported working more than 80 hours a week. Males were more likely than females to be working the longer hours, with 7.5% reportedly working over 80 hours, and a further 5.9% of males working between 71 and 80 hours a week. No female general surgeon reported working over 70 hours a week in total.

Male general surgeons of all ages worked longer total hours than their female counterparts. The highest average hours per week in total for males was in the 35 to 39 year age group (71.8 hours per week on average), while for females it was in the 40 to 44 year age group (58.3 hours per week on average). Over 35% of general surgeons spent 61 hours or more per week on the direct care of patients. 37.9% of males spent 61 hours or more, compared to 19% of females. 5.3% of males and no females reported working more than 70 hours a week in direct care.

**Table 18: General surgeons average hours per week spent in direct care of patients; average total hours excluding on call; average on call hours; by gender, 1994**

Average hours/week	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	80 +	Total
	( % of total general surgeons )									
<b>a. Direct care of patients</b>										
Males	2.6	3.9	4.8	10.2	17.9	22.7	32.6	3.1	2.2	100.0
Females	0.0	9.5	4.8	23.8	19.0	23.8	19.0	0.0	0.0	100.0
<b>Total</b>	<b>2.9</b>	<b>4.4</b>	<b>4.6</b>	<b>10.5</b>	<b>18.8</b>	<b>22.7</b>	<b>30.5</b>	<b>3.6</b>	<b>2.0</b>	<b>100.0</b>
% Female	0.0	7.4	3.1	7.0	3.3	3.3	1.9	0.0	0.0	3.1
<b>b. Total hours excluding on call</b>										
Males	2.2	3.0	4.2	7.2	11.2	23.2	35.6	5.9	7.5	100.0
Females	0.0	4.8	4.8	14.3	19.0	19.0	38.1	0.0	0.0	100.0
<b>Total</b>	<b>2.3</b>	<b>3.4</b>	<b>3.8</b>	<b>6.8</b>	<b>11.8</b>	<b>23.0</b>	<b>34.5</b>	<b>6.6</b>	<b>7.7</b>	<b>100.0</b>
% Female	0.0	5.0	3.6	6.1	5.3	2.6	3.4	0.0	0.0	3.1
<b>c. On call</b>										
Males	6.5	15.6	22.1	9.5	11.3	7.4	2.2	7.8	17.6	100.0
Females	0.0	42.9	0.0	14.3	14.3	0.0	0.0	0.0	28.5	100.0
<b>Total</b>	<b>6.5</b>	<b>16.7</b>	<b>20.4</b>	<b>9.5</b>	<b>10.2</b>	<b>6.9</b>	<b>2.2</b>	<b>7.3</b>	<b>20.3</b>	<b>100.0</b>
% Female	0.0	7.7	0.0	4.3	3.7	0.0	0.0	0.0	4.7	2.8

Excludes Western Australia and South Australia (except total which includes South Australia).

Source: AIHW

Average hours worked by general/vascular surgeons by major age groups is shown in Table 19. The general surgeons working the longest average hours were those aged 40 to 44 years, with an average of 61.2 hours per week. General surgeons aged between 30 and 60 years worked, on average, in excess of 55 hours per week. The vascular surgeons working the longest average hours per week were those aged 30 to 34 years.

**Table 19: General/vascular surgeons total average hours worked per week (excluding hours on call); by age group, 1994**

Age (years)	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 +
General surgeons	57.0	59.6	61.2	56.7	58.8	55.8	47.2	38.8	26.6
Vascular surgeons	70.0	59.2	54.0	60.0	61.0	-	42.0	39.5	0.3

Source: AIHW

In 1994, general surgeons spent an average of 51.2 hours per week on the direct care of patients, compared to the average for all specialists of 48.1 hours. The average hours spent on direct care by general surgeons did not vary greatly across regions (50.7 hours in capital cities; 50.9 hours in other major urban; and 53.2 hours in rural and remote locations). General surgeons in rural and remote locations, did, however, appear to spend a longer than average time per week on call than their urban counterparts. Vascular surgeons spent less time on call in rural and remote areas but a much longer time on call in urban areas (Table 20).

In 1994, general surgeons were on call for an average of 58.3 hours per week in rural and remote locations, compared to 47.1 hours in capital cities and 45.0 in other major urban areas. Vascular surgeons were on call for an average of 36.0 hours per week in rural and remote locations compare to 55.1 hours in capital cities and 64.7 hours in other major urban areas.

Overall, general surgeons spent an average of 49.4 hours per week on call and vascular surgeons spent an average of 55.5 hours per week on call, compared to 45.6 for all specialists. Whilst over half of general surgeons spent less than 40 hours per week on call, 20.4% reported that they spent over 80 hours per week on call. A higher proportion of females than males reported being on call for these long hours (28.5% females and 17.7% males). However, a higher proportion of females also reported being on call for less than 20 hours per week than males (42.9% of females and 22.1% of males).

**Table 20: General/vascular surgeons average hours per week spent in direct care of patients and on call; by geographic location of main job, 1994**

Surgeon	Capital city	Other major urban	Rural/Remote	Total
<b>General surgeons</b>				
Direct care of patients	50.7	50.9	53.2	51.2
On call	47.1	45.0	58.3	49.4
<b>Vascular surgeons</b>				
Direct care of patients	49.2	55.3	46.0	49.9
On call	55.1	64.7	36.0	55.5

Note: excludes Western Australia.

Source: AIHW

### *Public Hospital Involvement*

The AIHW survey data indicates that in 1994, 75.9% of general surgeons were working in their main job in private medical practitioners rooms or surgeries, and a further 17.7% were working in their main job in public acute care hospitals (Table 21).

Main place of work varied across States/Territories. In the Northern Territory there was a much higher proportion of general surgeons in public acute care hospitals. The RACS/AMWAC survey of surgeons indicated that 81% of respondents had public hospital attachments and State/Territory comparisons do not show much variation (see Table B4, Appendix B).

**Table 21: Specialists with a principal qualification in general surgery, by type of premises in which main job is located (%), 1994**

Premises	NSW	Vic	Qld	SA	Tas	NT	ACT	Total
Private rooms	73.4	83.4	70.5	63.4	71.4	54.5	100	<b>75.9</b>
Public acute hospital	19.3	12.5	21.3	25.4	21.4	45.5	0.0	<b>17.7</b>
Private acute hospital	2.1	0.0	1.6	1.4	0.0	0.0	0.0	<b>1.0</b>
Public tertiary	2.1	0.0	4.1	7.0	7.1	0.0	0.0	<b>2.1</b>
Public other	0.9	3.4	0.0	2.8	0.0	0.0	0.0	<b>0.6</b>
Private other	0.4	0.0	0.8	0.0	0.0	0.0	0.0	<b>1.7</b>
Not stated	1.7	0.6	1.6	0.0	0.0	0.0	0.0	<b>1.0</b>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	<b>100.0</b>

Does not include Western Australia.

Source: AIHW

## Services Provided and Performed

Surgical services in Australia are provided through Medicare and through other insurance arrangements in fee for service practice, and through the government funded public hospital system. Detailed service specific data on medical services which attract Medicare benefits is available for many years. Public hospital casemix data is available from 1991-92 through to 1994-95. Private hospital casemix data is only available for 1994-95.

### Medicare Services

Table 22 provides information on the total number of medical services which attract Medicare benefits provided by general and vascular surgeons. The average number of Medicare services provided in 1995-96 by general surgeons was 2,205, while in the same year the average number of services provided by non standard general surgeons was 780, and for vascular surgeons was 1,825. The number of Medicare general surgery providers increased by 3% from 1990-91 to 1995-96 while the total number of services provided increased by 14.1% over the same period. Vascular surgery services provided increased by 33.9% over the same period.

The most common MBS items provided by both general/vascular surgeons in 1995-96 were specialist consultations (MBS items 105 and 104). When the totals for these items are excluded, the increase in services provided by general and vascular surgeons over the past five years, was 1.5% and 62.3%, respectively.

**Table 22: General/vascular surgeons services provided (Medicare), 1990-91 and 1995-96**

Year	Providers	Average number of services	Total number of services	Total number of services (excluding consultations)
<b>General surgeons</b>				
1990-91	931	2,023	1,883,510	620,558
1995-96	959	2,205	2,149,772	630,068
% increase	3.0	9.0	14.1	1.5
<b>Vascular surgeons</b>				
1990-91	99	1,638	162,207	47,113
1995-96	116	1,825	217,118	76,480
% increase	20.2	11.4	33.9	62.3

Source: DHFS

Table 23 highlights the top MBS items provided by general surgeons for selected years. In 1995-96 these top 22 items represented 90% of all items billed by general surgeons.

**Table 23: Top Medicare items provided by general surgeons, selected years 1984-85 to 1995-96**

Item	Description	1984-85	1990-91	1995-96	% change 1990-1996
105	Consultation - subsequent to initial referred	452,381	676,436	823,014	21.7
104	Consultation - initial for a referred condition	376,822	586,516	696,690	18.8
30118	Tumour, cyst, ulcer, scar removal <=3cm - subcutaneous etc	43,034	76,728	87,445	14.0
32072	Sigmoidoscopy	41,556	52,046	57,396	10.3
32090	Colonoscopy	6,470	29,261	46,887	60.2
30473	Upper GI endoscopy	10,001	33,486	44,476	32.8
32135	Band ligation of haemorrhoids	6,666	13,533	17,736	31.1
30445	Laparoscopy cholecystectomy	a	13,387 <sup>b</sup>	13,599	- 1.6
23	Consultation - unreferred, short	a	4,766	13,569	184.7
32093	Colonoscopy with polypectomy	1,860	6,522	13,401	105.5
30144	Tumour or deep cyst removal - wide excision	a	6,804	13,109	92.7
30614	Femoral or inguinal hernia or infantile hydrocele repair	10,474	13,844	12,880	- 7.0
32084	Fibre optic sigmoidoscopy	6,242	11,791	12,752	8.2
30136	Tumour etc >3cm diameter, removal	5,033	10,150	10,955	8.0
53	Unreferred consultation	a	23,235	10,824	-53.4
37623	Vasectomy	8,349	12,252	10,804	-11.8
30439	Operative cholangio, pancrea/ tography, intra-operative ultrasound	7,923	9,008	9,258	2.8
51303	Assistance at an operation	9,182	8,727	8,903	2.0
47915	Wedge resection of nailbed	a	a	7,983	-
30346	Breast excision of lump with frozen section or radiography	6,325	8,811	7,831	-11.1
30147	Malignant skin tumour, removal - wide and deep excision	1,489	3,937	7,328	86.1
30140	Tumour etc, deep tissue, removal	3,407	5,636	7,232	28.3
<b>Total</b>		<b>997,214</b>	<b>1,606,876</b>	<b>1,934,072</b>	<b>20.4</b>
Total (excluding consultations)		168,011	343,924	389,975	13.4

Note: These figures are from a listing of the top 60 items in each year; items not in the top 60 are indicated by a. b - the 1990-91 figure for laparoscopy cholecystectomy is actually the 1993-94 number of procedures. The 1990-91 figure

was not used because of item numbering changes. Source: DHFS

Table 23 lists the top items in 1995-96 and how they compared in earlier years, not the top items in each of the selected years.

Removal of a tumour etc, less than 3 centimetres in diameter (item 30118) was the most common surgical MBS item provided by general surgeons, in 1995-96. Table 23 shows there has been a large increase in colonoscopies, significant increases in deep tumour removals and malignant skin tumour removals and upper GI endoscopic work.

The significant involvement in endoscopic work and the limited involvement of general surgeons in the work areas of other surgical specialties was also demonstrated in the response to the RACS/AMWAC survey (Table 24).

**Table 24: General surgeons practice activity, 1996**

<b>Activity</b>	<b>General surgeons performing activity (%)</b>	<b>Average of practice time in activity (%)</b>
Lower GI endoscopy	41	27
Upper GI endoscopy	40	21
Medico-legal	25	9
Paediatric surgery	20	3
Plastic and reconstructive surgery	20	7
Urology	13	5
Orthopaedic surgery	11	4
Transplant and access surgery	9	20
Thoracic surgery	8	3
Ear, nose and throat surgery	7	3
Gynaecology	7	3
Neurosurgery	4	2

Source: RACS/AMWAC survey

Table 25 outlines the top MBS items provided by vascular surgeons. The 12 items shown in the table represented 84% of all vascular surgery Medicare services in 1995-96. This shows that the Medicare work performed by vascular surgeons is mainly in the areas of consultation and investigation. As with Table 23, this table lists the top vascular surgery items in 1995-96 and shows how they compared to 1990-91.

**Table 25: Top Medicare items provided by vascular surgeons, selected years 1984-85 to 1995-96**

Item	Description	1990-91	1995-96	% change 1990-1996
105	Consultation - subsequent to initial referred	66,552	91,267	37.1
104	Consultation - initial for a referred condition	40,386	49,371	22.2
55201	Duplex scanning	6,516	9,553	46.6
32500	Varicose veins - injection	7,543	8,679	15.1
11603	Doppler recording (at rest)	7,581	8,524	12.4
32508	Varicose veins - operation	a	5,007	-
11612	Doppler recording (after exercise)	2,727	2,530	- 7.2
55234	Duplex scanning	2,410	1,898	-21.2
51303	Assistance at an operation	1,517	1,635	7.8
33500	Endarterectomy	a	1,456	-
32514	Varicose veins - ligation	a	1,029	-
11609	Doppler recording	1,719	1,026	-40.3
<b>Total</b>		<b>136,951</b>	<b>181,975</b>	<b>32.9</b>
Total (excluding consultations)		30,013	41,337	37.7

Note: These figures are from a list of the top 60 items; items which were not in the top 60 are indicated by a.

Source: DHFS

Table 23 indicated a shift has been occurring in the work performed by general surgeons. This trend is confirmed by examination of selected groups of Medicare items which show that whilst general surgeon consultations, endoscopic work and minor procedures have risen considerably, the involvement of general surgeons in their acknowledged operative work has decreased, if not since 1984-85, certainly since 1990-91. These trends are summarised in Table 26 and outlined in considerable detail in Appendix D. The operations examined and the MBS items included in the analysis were considered by the Working Party to be indicative of the operative work performed by general surgeons.

Table 26 shows that general surgery Medicare operations have declined in most of the selected categories over the past five years with an overall decline of 8.9%. In some areas the reduction has been due to apparent change in disease incidence (appendix) and in others it has been due to other therapeutic interventions (gastric). In many areas

the shift will have been from Medicare to public hospital patient services.

**Table 26: General surgical operations performed by general surgeons (Medicare data), 1991-92 and 1995-96**

<b>Operation</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change</b>
Ano-rectal	17,721	18,195	2.7
Appendectomy	8,540	5,943	-30.5
Breast	22,697	19,770	-12.9
Circumcision	3,219	2,736	-15.1
Cholecystectomy*	16,741	16,477	- 1.6
Gastric	2,745	2,596	- 5.4
Hernia	22,694	22,510	- 0.8
Laparotomies	8,274	7,212	-12.8
Large bowel resections	6,935	7,074	2.0
Scrotal (not vasectomy)	3,927	3,045	-23.2
Thyroid and parathyroid	3,401	3,548	4.3
Varicose vein	8,698	5,209	-40.0
<b>Total</b>	<b>125,592</b>	<b>114,315</b>	<b>- 8.9</b>

\* 1991-92 cholecystectomy figure is actually the 1993-94 number of operations. The 1991-92 figure was not used because of item numbering changes which rendered any meaningful comparison between 1991-92 and 1995-96 impossible.

Source: DHFS

On the other hand, Table 27, highlights the increasing performance of endoscopic procedures by general surgeons, which has increased by 39.4% over the same four year period.

**Table 27: Endoscopic procedures performed by general surgeons (Medicare data), 1991-92 and 1995-96**

<b>Procedure</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change</b>
Colonoscopy	40,988	60,288	47.0
Rigid sigmoidoscopy	53,852	58,520	8.6
Flexible sigmoidoscopy	13,012	13,547	4.1
Upper GI endoscopy	21,181	47,520	124.3
<b>Total</b>	<b>129,033</b>	<b>179,875</b>	<b>39.4</b>

Source: DHFS

The Working Party also examined the contribution of general surgeons in services to vascular, urology and orthopaedics and this appears to be low and decreasing (see Appendix D, Tables D21 to D30).

Appendix D (Tables D21 to D26) provide details, using Medicare data, for vascular surgery procedures. The trend over the period 1991-92 to 1995-96 is summarised in Table 28. It shows that Medicare activity has declined by 3.2%. Yet, despite this overall trend, for those vascular procedures significantly shared with other specialties, vascular surgeons have increased their share. Nevertheless, as judged by this fairly comprehensive selection of relevant procedures, vascular surgeons have decreased their Medicare activity in the more traditional areas of vascular surgery.

**Table 28: Vascular operations performed by vascular surgeons (Medicare data), 1991-92 and 1995-96**

<b>Operations</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change</b>
Amputation	493	612	24.1
Arterial aneurysms	900	941	4.5
Arterial bypass	2,173	1,874	-13.8
Arterial trauma & embolectomies	1,067	998	- 6.5
Carotid	1,489	1,556	4.5
Varicose vein	8,348	8,035	- 3.8
<b>Total</b>	<b>14,479</b>	<b>14,016</b>	<b>- 3.2</b>

Source: DHFS

In 1994-95, 30.8% of Medicare services provided by general surgeons were direct billed; while, 36.7% of services provided by non standard general surgeons and 21.5% of services provided by vascular surgeons were direct billed. This level of direct billing by general surgeons was one of the highest proportions of direct billing of all surgeons. The levels of bulk billing by both types of general surgeons and vascular surgeons was higher in 1994-95 than in 1990-91.

#### *Public Hospital Casemix*

As is well known, Medicare does not cover the full spectrum of surgery for any diagnosis. It excludes non fee for service public hospital work and work completed under other insurance arrangements. As a result, hospital casemix data, as measured by AN-DRGs, is used as another indicator of the services provided.

AN-DRG procedures predominantly performed by general surgeons were selected to analyse the trends in public hospital general and vascular surgery. Table 29 shows that for all the selected procedures, except for appendix, the numbers are increasing. The

total increase for the selected procedures was 14.2% (3.5% per annum). The largest increase have been in anal, breast and gall bladder procedures. During the period 1991-92 to 1994-95 the Australian population increased by 3.2%, so it can be seen that, again with the exception of appendix procedures, the increase in most procedures has been well in excess of population growth. Table 30 provides similar information for selected vascular surgery procedures.

**Table 29: General surgery AN-DRGs (public hospitals); by selected procedure, 1991-92 to 1994-95**

<b>Procedure</b>	<b>1991-92</b>	<b>1992-93</b>	<b>1993-94</b>	<b>1994-95</b>	<b>% change 1991-95</b>
Anal	16,069	17,069	18,238	19,386	20.64
Appendix	19,205	19,817	19,472	19,058	- 0.77
Breast	13,600	14,739	14,989	17,905	31.65
Gall bladder	18,762	21,072	22,298	22,808	21.56
Hernias	27,085	28,355	29,335	29,562	9.15
Large bowel	9,885	10,319	10,525	11,199	13.29
Scrotal	5,934	6,198	6,233	6,155	3.72
Varicose veins (operations)	8,231	8,322	9,128	9,538	15.88
<b>Total</b>	<b>118,771</b>	<b>125,891</b>	<b>130,218</b>	<b>135,611</b>	<b>14.18</b>

AN-DRG numbers: anal - 317, 318; appendix 313, 314; breast - 496, 497, 498; gall bladder - 365, 366, 367; hernia - 319, 320, 321; large bowel resections - 305, 306; scrotal - 609, 610; varicose veins 239.  
Source: AHMAC & DHFS, Australian Casemix reports 1991-92 to 1994-95

**Table 30: Vascular surgery AN-DRGs (public hospitals); by selected procedure, 1991-92 to 1994-95**

<b>Procedure</b>	<b>1991-92</b>	<b>1992-93</b>	<b>1993-94</b>	<b>1994-95</b>	<b>% change 1991-95</b>
Amputation	379	334	342	366	- 3.4
Circulatory	14,751	17,473	11,984	11,757	-20.3
Extracranial	1,815	2,461	2,484	2,813	55.0
<b>Total</b>	<b>16,945</b>	<b>20,268</b>	<b>14,810</b>	<b>14,936</b>	<b>-11.9</b>

AN-DRG numbers: amputation - 411, 412; circulatory - 228, 229, 230, 231, 232, 233, 234; extracranial - 27, 28, 29. For varicose veins see above in Table 29.

Source: AHMAC & DHFS, Australian Casemix reports 1991-92 to 1994-95

Table 31 tries to 'mesh' the AN-DRG and Medicare data. The figures displayed in Table 31 are not mutually exclusive but they do give some rough indication of the proportion of those procedures that attract Medicare benefits.

**Table 31: General surgery AN-DRG (public hospitals) and Medicare procedures performed by general surgeons, 1994-95**

Procedure	AN-DRG <sup>a</sup>	Medicare <sup>b</sup>	% Medicare
Anal	19,386	17,933	48.1
Appendix	19,058	6,527	25.5
Breast	17,905	24,199	57.5
Gall bladder	22,808	16,326	41.7
Hernias	29,562	22,819	43.6
Large bowel resection	11,199	7,185	39.1
Scrotal	6,155	3,345	35.2
Varicose veins - operations	9,538	6,380	40.1

a - procedures performed by all providers

b - procedures performed by general surgeons; these figures represent 87.1% of all anal Medicare procedures, 77.8% of all appendix, 91.0% of all breast, 95.7% of all gall bladder, 78.1% of all hernias, 94.8% of all large bowel resections, 26.9% of all scrotal and 34.1% of all varicose vein operations

Source: DHFS

In conclusion, the two sets of services data examined - Medicare and public hospital AN-DRGs - show that there has been a 14.2% increase in public hospital general surgery services between 1991-92 and 1994-95, equivalent to a growth of 3.5% per annum; and an 8.9% decrease in general surgery services attracting Medicare benefits between 1991-92 and 1995-96, equivalent to a fall of 1.8% per annum. Recognising that the data sets are not mutually exclusive and as such it is not possible to absolutely match the two sets of data, it would appear that there has been something like a 1-1.7% per annum increase in general surgery services occurring in recent years.

These service trends probably in part reflect the decrease in the number of people taking out private health insurance that has been occurring over recent years. The ageing of the population may also be a factor. Whatever the cause, the trends will need to be monitored.

### **Training Arrangements**

The RACS training program in general surgery can commence after the intern year. The Part I program involves surgical rotations for two years including periods in an emergency department and an intensive care unit. During this period the trainee is registered with the RACS and mentor reports are kept to monitor the trainee's progress in their clinical work. To complete the Part I component the trainee must pass a multiple choice exam in basic science and an Objective Structured Clinical Assessment exam.

After the successful completion of the Part I training and examination the trainees apply for selection into Part II training posts in general surgery. In Queensland, South Australia and Western Australia there are State based centralised selection processes organised by the RACS. There is a combined Victoria/Tasmania selection process which facilitates exchange of trainees in those States. In New South Wales, the selection process is based on major teaching hospitals.

Part II trainees enter for a four year training program. Trainees rotate through posts which have been approved for advanced training by the RACS after inspection and conformity to criteria which guarantee an appropriate training standard. Trainees keep log books which together with their general performance is kept under surveillance and is reported. One year of the four may be taken in research or in a surgical sub-specialty. A small percentage of these trainees decide during the training program to apply to transfer to one of the other specialties, for example urology or plastic surgery (RACS 1994).

Vascular surgical training requires acquisition of FRACS General Surgery and then two further years of training and examination in vascular surgery. It should also be noted that special arrangements for rural surgical practice are currently being developed by the RACS.

As at June 1996, there were 176 approved general surgery training posts distributed through the States/Territories as shown in Table 32. There are no training programs based in the Northern Territory but two trainees rotate to the Northern Territory. Table 33 compares the distribution of training positions with population and shows that Victoria has a proportionately higher number of training positions, whilst New South Wales, Western Australia and South Australia have proportionately less. The number of training positions in Queensland is in line with population.

The RACS indicated to the Working Party that it is mindful of both the need to train sufficient surgeons to adequately provide services to the community and to have sufficient good quality training positions in the major central city teaching hospitals, suburban hospitals and the rural base/regional hospitals. In the larger states of New South Wales and Victoria there has been a ready matching of training posts and training requirements. In the rapidly expanding states of Queensland and Western Australia it has been more difficult to find suitable training positions to meet the expanding surgical training needs (RACS 1994).

In some States a number of additional general surgery training positions are also designated for general surgical experience for those specialties that require a general surgery rotation in their training program, for example cardiothoracic surgery, urology and plastic and reconstructive surgery.

**Table 32: General surgery advanced training positions; by hospital and by State/Territory, 1996**

<b>State/Territory - Area/Hospital</b>	<b>Accredited positions</b>
<b>New South Wales/Australian Capital Territory</b>	<b>58</b>
Eastern Sydney - Prince of Wales <i>(with rotation to Bankstown, Sutherland, Tamworth Base)</i>	8
Central Sydney - Royal Prince Alfred <i>(with rotation to Illawarra Regional, Orange Base)</i>	8
Northern Sydney - Royal North Shore <i>(with rotation to Gosford, Hornsby, Manly, Lismore Base)</i>	8
South Western Sydney - Liverpool, St George, St Vincent=s <i>(with rotation to Bankstown, Canterbury)</i>	13
Western Sydney - Westmead, Concord, Nepean <i>(with rotation to Auburn, Blacktown, Mt Druitt, Dubbo Base, Canberra)</i>	15
Newcastle - John Hunter <i>(with rotation to Belmont, Newcastle Mater, Port Macquarie Base)</i>	6
<b>Victoria/Tasmania</b>	<b>58</b>
Region 1 - Royal Melbourne and Tasmania <i>(Royal Melbourne, Western, Ballarat, Horsham, Wangaratta, Albury Base - NSW, Royal Hobart - Tas., Launceston - Tas.)</i>	17
Region 2 - Austin/Repatriation/St Vincent=s <i>(Austin, Repatriation, St Vincent=s, Box Hill, Dandenong, Maroondah, Preston and Northcote, Geelong, Bendigo, Goulburn Valley)</i>	22
Region 3 - Alfred/Monash Medical Centre <i>(Alfred, Monash Medical Centre, Dandenong, Frankston, Moorabbin, La Trobe)</i>	19
<b>Queensland</b>	<b>32</b>
Northern Region - Royal Brisbane <i>(Royal Brisbane, Gold Coast, Nambour, Redcliffe, Cairns, Townsville, Toowoomba)</i>	16
Southern Region - Princess Alexandra <i>(Princess Alexandra, Mater, Ipswich, Gold Coast, Nambour, Cairns, Townsville, Greenslopes Private)</i>	16

<b>South Australia/Northern Territory</b>	<b>13</b>
Flinders Medical Centre ( <i>with rotation to Daw Park Repatriation</i> ), Modbury, Queen Elizabeth, Royal Adelaide ( <i>with rotation to Lyell McEwin</i> ), Alice Springs	
<b>Western Australia</b>	<b>15</b>
rotating to Royal Perth, Fremantle, Sir Charles Gardiner, Bunbury, Hollywood Private	

Source: RACS

**Table 33: General surgery advanced training positions; by State/Territory and population, 1996**

State/Terr.	NSW	Vic/Tas	Qld	SA/NT	WA
% total positions	32.9	33.0	18.2	7.5	8.6
% of total population	35.6	27.7	18.1	8.2	9.6

Source: RACS and ABS

Table 34 details the number of general surgery trainees over the past seven years. From 1989 to 1996 there was a 39% increase in trainee numbers. This varied considerably between States/Territories with a 100% increase in Western Australia and an 18.2% increase in trainees in South Australia. The increase in Western Australia was necessary to bring that State=s trainee numbers to a level appropriate to its population. The lower increase in trainees in South Australia was necessary to address the relatively high SPR in that State. In 1996, 13.6% of trainees were female.

The AIHW labour force survey reported that in 1994, general surgery trainees spent an average of 62.7 hours per week on care of patients and vascular surgery trainees reported 66.3 hours per week. This was much higher than the average for all specialists in training of 51.5 hours per week. The hours reported by male and female general surgery trainees were very similar at 63.1 and 60 respectively.

Almost half of the general surgery trainees reported working in excess of 60 hours per week in the direct care of patients, while almost three quarters reported working over 50 hours per week. The figures were similar for male and female trainees, although a higher proportion of males (28%) were working in excess of 70 hours per week than females (10%) (AIHW 1996).

**Table 34: General surgery advanced trainees; by State/Territory and by year, 1989 to 1996**

Year	NSW/ACT	Vic/Tas	Qld	SA/NT	WA	Total
1989	44	36	24	11	8	<b>123</b>
1990	45	39	25	11	8	<b>128</b>
1991	47	39	27	12	10	<b>135</b>
1992	48	46	27	14	12	<b>147</b>
1993	48	47	27	14	12	<b>148</b>
1994	49	48	29	15	14	<b>155</b>
1995	56	57	30	14	19	<b>176</b>
1996	60	52	31	13	16	<b>172</b>
% increase 1989-1996	36.4	44.4	29.2	18.2	100.0	<b>39.8</b>

Source: RACS

The average age of acquisition of FRACS (General Surgery) is 33 years. There is some expectation that this age may tend to rise, especially with the advent of graduate entry medical courses; although it will be some ten years before this possibility would start to have any effect.

Table 35 shows there have been 227 surgeons admitted to general surgery fellowship in the last seven years, an average of 32 per year.

**Table 35: General surgery trainees admitted to the RACS Fellowship, 1989-90 to 1995-96**

Year	NSW/ACT	Vic/Tas	Qld	SA/NT	WA	Total
1989-90	16	9	3	4	4	<b>36</b>
1990-91	6	9	5	3	1	<b>24</b>
1991-92	14	7	5	3	0	<b>29</b>
1992-93	15	10	5	4	4	<b>38</b>
1993-94	11	10	3	4	5	<b>33</b>
1994-95	16	9	7	2	2	<b>36</b>
1995-96	10	9	3	4	5	<b>31</b>
<b>Total</b>	<b>88</b>	<b>63</b>	<b>31</b>	<b>24</b>	<b>21</b>	<b>227</b>

Source: RACS

In parallel with the established Part II training program, extra training positions of an equivalent standard are used to train foreign doctors who come to Australia for surgical

training and complete a Fellowship with the RACS before returning to their home country. Similar training positions are available to immigrant surgeons who are judged to need one to four years further training before completing a Fellowship. It is the RACS policy to have at least one training position in each State reserved for this group.

## ADEQUACY OF THE CURRENT GENERAL SURGERY WORKFORCE

There are a number of indicators of the adequacy of a medical workforce. No single measure can provide a definitive assessment, however, by examining a range of pertinent measures it is possible to gain an indication of whether a workforce is adequately meeting current demand or if there is a significant shortfall or oversupply. The indicators chosen by the Working Party were:

- surgeon:population ratio;
- public hospital vacancies;
- elective surgery waiting times;
- waiting times for consultations; and
- surgeons' perceptions of the adequacy of the current workforce.

### General Surgeon:Population Ratio

The Working Party concluded that after examination of the available literature that no clear-cut benchmark for general surgery has been defined (Doherty 1988, Nelson 1988 and 1991, Hjorth 1987, Watkin 1995). In addition, the Working Party concluded that international comparisons suffer because of uncertainties about definitions of specialist general surgeons and variations in style and scope of practice and health care systems.

The Working Party believes that the value of the general surgery SPRs lies in their use as tools of comparison between States/Territories and for comparisons over time. Tables 4 and 5 calculated SPRs using RACS and Medicare data. The Medicare data is used in this section to provide some comparisons over time. Table 36 highlights trends in SPRs across States/Territories over the past 12 years.

**Table 36: General/vascular surgeon:population ratio (Medicare data); by State/Territory, 1984-85 and 1995-96**

Year	NSW	Vic	Qld	SA	WA	Tas	ACT	NT
<b>1984-85</b>								
General/vascular surgeons	279	245	108	76	62	17	9	5
Pop. ('000)	5464.5	4120.1	2571.2	1371.2	1418.6	442.8	251.4	148.5
SPR 1:	19,586	16,817	23,807	18,042	22,881	26,047	27,933	29,700
<b>1995-96</b>								
General/vascular surgeons	378	295	171	108	90	27	10	6
Pop. (>000)	6190.2	4541.0	3354.7	1479.2	1762.7	473.7	307.5	177.1
SPR 1:	17,190	15,393	19,618	13,696	19,585	17,544	30,750	29,517

Note: 1995-96 population is an estimate.

Source: DHFS and ABS

Table 37 shows that the Australian SPR for general/vascular surgeons has remained fairly constant over the past 12 years; ranging from a high of 1:17,012 in 1995-96 to a low of 1:19,662 in 1984-85. (Note recent years, except 1995-96, do not include vascular surgeons)

**Table 37: General/vascular surgeon:population ratio (Medicare data); by year, 1984-85 to 1995-96**

Year	General surgeons	Population ('000)	Population per general surgeon
1984-85	803	15,788.3	19,662
1985-86	846	16,018.4	18,934
1986-87	852	16,263.3	19,088
1987-88	907	16,538.2	18,234
1988-89	892	16,814.4	18,850
1989-90	920	17,065.1	18,549
1990-91	931	17,284.0	18,565
1991-92	944	17,489.1	18,527
1992-93	940	17,656.4	18,783
1993-94	925	17,843.3	19,290
1994-95	970	18,049.0	18,607
1995-96	1075	18,289.1	17,012

Note: 1995-96 population is an estimate.

Source: DHFS and ABS

### **Public Hospital Vacancies**

The difference between active supply and current requirements in the public hospital system can be indicated by the vacancy rate or level of unfilled positions.

The AMWAC survey of public hospital specialist vacancies conducted in October 1996 found there were only ten general surgery vacancies; comprising seven staff specialist vacancies and three VMO vacancies. The survey also found there was only one vascular surgery vacancy. This would represent a combined vacancy rate of 1%.

There were four vacancies in New South Wales and three in Victoria, two in Queensland and one in Western Australia. Seven of the vacancies were in rural areas. There were no TRDs filling general surgery or vascular surgery vacancies.

## **Elective Surgery Waiting Times**

Elective surgery waiting lists are often used as indicators of the adequacy of services, although there are limitations with the use of waiting lists. These include:

- the lack of consistent standardised collection and reporting which hampers any meaningful national interpretation;
- the fact that just looking at the number of people on waiting lists conceals the fact that large numbers of people proceed through the system within a reasonable time; and
- that waiting lists are open to manipulation, especially in the way they are maintained and through such devices as the allocation of theatre time and resources.

In turn, this means that it can be difficult to isolate the impact any workforce shortage may have on the size of a waiting lists and waiting times from the impact of other factors.

The AIHW has tried to provide some degree of national interpretation of waiting lists by conducting, in 1994 and 1995, two surveys of State and Territory health authorities which aimed to collect nationally consistent information. The most recent report emphasised waiting times, as waiting time indicates the ability of the hospital system to meet the demand for elective surgery (Moon 1996).

The AIHW report classified patients as either category 1 or category 2, where category 1 patients are those where admission is desirable within 30 days and category 2 patients are those where admission can be beyond 30 days. The proportion of general surgery and vascular surgery admissions that were classified as category 1 was above the average for all specialties. The percentage that were same day patients were below the average of all specialties.

The largest groups of patients on the waiting list were category 2 patients in the orthopaedic and general surgery groups, each accounting for almost 20% of the list. General surgery patients made up 21.3% of the list with 1.6% as category 1 and 19.8% as category 2. Vascular surgery patients made up 2.1% of the list with 0.2% as category 1 and 2% as category 2.

The AIHW report (Moon 1996) also examined clearance times and found that the clearance time for general and vascular surgery patients, compared with other specialties, was above average in both teaching hospitals, and in non-teaching hospitals. Clearance times are expressed in months, and are defined by the number of patients on the waiting list at a point in time divided by the number of patients cleared (admitted and removed) from the waiting list per month. Clearance time is the theoretical time it would take to clear all patients from the waiting lists at a point in time, assuming the clearance rate remained constant.

**Table 38: Clearance times for elective surgery waiting lists, Australian public hospitals, hospital type; by speciality and indicator procedure (months), 1995\***

	Teaching hospitals	Non-teaching hospitals	All hospitals
General surgery	2.3	2.1	2.2
Vascular surgery	2.6	2.1	2.5
Cholecystectomy	3.1	3.0	3.0
Haemorrhoidectomy	4.8	3.4	4.0
Varicose veins stripping and ligation	12.7	5.4	8.5
All patients	2.7	2.6	2.7

\* excludes Queensland

Source: AIHW

**Table 39: General and vascular surgery elective surgery clearance times, category 1 and 2 patients, Australian public hospitals; by State/Territory, 1995**

Procedure	NSW	Vic	Qld <sup>a</sup>	SA	WA	Tas	ACT	NT	Aust <sup>b</sup>
<b>Category 1</b>									
General surgery	0.5	0.2	1.1	0.4	0.2	0.8	2.1	1.3	0.5
Vascular surgery	0.5	0.7	1.3	0.3	0.1	1.1	2.1	..	0.5
Cholecystectomy	0.8	1.1	1.5	0.7	0.0	1.7	na	2.4	0.9
Haemorrhoidectomy	1.1	1.4	0.0	0.3	0.0	0.9	na	- <sup>c</sup>	1.0
Varicose veins stripping and ligation	1.1	0.9	- <sup>c</sup>	3.4	1.5	- <sup>c</sup>	na	3.6	1.0
<b>Category 2</b>									
General surgery	2.3	3.4	3.4	2.8	3.6	3.7	10.2	7.4	3.0
Vascular surgery	2.9	6.0	2.6	2.3	2.2	5.0	11.4	..	3.9
Cholecystectomy	3.5	4.0	4.3	2.5	5.0	3.2	na	9.4	3.7
Haemorrhoidectomy	3.1	7.1	3.4	3.7	5.0	6.5	na	16.7	4.7
Varicose veins stripping and ligation	5.7	15.9	4.2	8.7	18.2	13.0	na	21.3	9.3

a - data is from a separate survey of Queensland hospitals which was not included in the figures for Australia; b - excludes Queensland; c - not available due to small sample size; .. not applicable; na - not available.

Source: AIHW

Table 39 shows that for category 1 patients, the clearance times were within one month in all States/Territories for general surgery patients except the Australian Capital Territory (2.1 months) and the Northern Territory (1.3 months). For vascular surgery category 1 patients, the clearance times were within one month in all States/Territories except Tasmania (1.1 months) and the Australian Capital Territory (2.1 months). Victoria and Western Australia had the lowest clearance times for elective general surgery category 1 patients (0.2 months) and Western Australia had the lowest for vascular surgery patients (0.1 months).

New South Wales had the lowest for general surgery category 2 patients (2.3 months) and Western Australia had the lowest for vascular surgery category 2 patients (2.2 months). The Australian Capital Territory had the highest clearance times for general surgery and vascular surgery category 1 patients (2.1 months) and category 2 patients (10.2 and 11.4 months respectively).

The overall clearance of general surgery and vascular surgery patients of 0.5 months for category 1 patients would suggest that general and vascular surgery patients are being treated within a reasonable time.

### Consultation Waiting Times

The RACS/AMWAC survey of surgeons collected information on surgeon consultation waiting times. The results are shown below in Tables 40 and 41 and reveal that in general private patients are more expediently dealt with. The waiting times for an urgent condition are appropriately short. The waiting times for a disabling condition are too long in the public hospital system in Western Australia and Tasmania. However, overall, the Working Party felt that the results of the survey did not point to a shortage of general surgeons.

**Table 40: Average waiting time (days) for a first general surgical consultation, urgent condition and major procedure, private rooms; by State/Territory 1996**

State/Territory	Standard consultation	Urgent condition	Major procedure, disabling condition
NSW/ACT	16	3	6
Victoria	8	2	6
Queensland	9	2	6
South Australia	9	2	6
Western Australia	15	2	7
Tasmania	8	1	8

Source: RACS/AMWAC survey of surgeons

**Table 41: Average waiting time (days) for a first general surgical consultation, urgent condition and major procedure, public; by State/Territory, 1996**

State/Territory	Standard consultation	Urgent condition	Major procedure, disabling condition
NSW/ACT	7	2	27
Victoria	14	4	21
Queensland	33	6	21
South Australia	13	4	9
Western Australia	32	5	44
Tasmania	27	6	69

Source: RACS/AMWAC survey of surgeons

### Surgeons' Workload

For surgeons responding to the RACS/AMWAC survey of surgeons, the average number of operations was 38 per month. This number was equally split between major and minor procedures.

In the survey, 68% of respondents indicated they were satisfied with their workload, 25% felt they were over worked but only 10% felt that more general surgeons were required in their geographic area. In response to the question on capacity to increase workload, 38% of surgeons indicated they had time available to increase their operating time and 30% indicated time available to increase their consultative work. 81% of respondents had commitments to the public hospital system. Of the respondents 35.6% said they had a capacity to increase their public hospital work. On average respondents felt they had the capacity to conduct an extra 1.7 sessions per week.

**Table 42: General surgeons indicating a capacity to increase public hospital work; by State/Territory, 1996**

State/Territory	Able to increase sessions (%)	Average increase in sessions per week
NSW/ACT	43.9	1.4
Victoria	39.6	1.9
Queensland	19.4	1.5
South Australia	40.5	1.7
Western Australia	36.7	1.5
Tasmania	46.7	1.8
<b>Australia</b>	<b>35.6</b>	<b>1.7</b>

Source: RACS/AMWAC survey of surgeons

### **Conclusions on the Adequacy of the Current General Surgery Workforce**

Overall, the Working Party concluded that the current general/vascular surgery workforce is adequately meeting current requirements. None of the indicators chosen by the Working Party pointed to large potential shortages. Nationally, the SPR has been reasonably constant over the past twelve years; public hospital vacancies are extremely low; none of the major waiting time indicators are excessively high and, in general, there is a high degree of satisfaction with workloads.

SPRs indicate that Queensland, Western Australia and Tasmania remain above the Australian SPR, which shows that these States could require proportionately more general surgeons. This is the same for Northern Territory and Australian Capital Territory which are significantly above the Australian level. Similarly, elective surgery waiting times for an urgent condition are a little higher in Queensland and Tasmania than other States and first consultation waiting times for a major procedure are higher in Western Australia and Tasmania. However, overall the Working Party considered these factors to be indicative of some maldistribution problems within the workforce, rather than any significant shortage in the workforce as a whole.

## **PROJECTIONS OF REQUIREMENTS**

### **Population**

Australia has a growing and an ageing population. The 1995-96 Australian population is estimated at 18.29 million (ABS 1997). The ABS estimates that population will reach 19.169 million by 2001 and 20.095 million by 2006 (ABS 1994). Between 1995-96 and 2006-2007 population is expected to increase by 1.2% per annum.

The 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 12.7% (2.56 million) in 2006 (ABS 1994).

### **Trends in Utilisation**

The trends in the services provided by general/vascular surgeons using Medicare data and public hospital casemix data are summarised in Table 43.

Whilst some of the Medicare data on trends show large increases, the Working Party considers the most useful information to be the trends in total Medicare services (excluding consultations) and the trends in the selected Medicare procedures.

In total, once consultations are excluded, procedures attracting Medicare benefits performed by general surgeons and vascular surgeons have only increased, on average, by 0.3% and 1.16%, per annum, respectively.

More importantly, however, is the fact that when the utilisation trends for selected procedures are examined, it shows there has been a decrease in both general surgeon and vascular surgeon activity of 1.78% and 0.64%, per annum, respectively. The selected procedures are those that are considered to be the traditional areas of general surgery (Table 26 and in detail Appendix D).

It would appear that two shifts are occurring in general surgical practice. First, general surgeons are performing more endoscopic work and less of the acknowledged general surgical procedures. Secondly, public hospital casemix data shows there has been a steady increase in general surgical activity, estimated at 3.5% per annum; at the same time as there has been very little annual growth in total Medicare procedures and negative growth in selected Medicare procedures. Overall, the Working Party estimates that there has been a 1-1.7% annual growth in general/vascular surgical operative work.

**Table 43: Trends in service provision by general/vascular surgeons, 1990-91 to 1995-96**

Indicator	% change (total)	% change (average per year)
Medicare services provided by general surgeons	14.1	2.82
Medicare services provided by general surgeons (excluding consultations)	1.5	0.30
Medicare services provided by vascular surgeons	33.9	6.68
Medicare services provided by vascular surgeons (excluding consultations)	62.3	12.46
Medicare services provided by general and vascular surgeons	15.7	3.14
Medicare services provided by general and vascular surgeons (excluding consultations)	5.8	1.16
Top 22 Medicare items provided by general surgeons	21.4	4.08
Top 22 Medicare items provided by general surgeons (excluding consultations)	28.9	2.68
Top 12 Medicare items provided by vascular surgeons	32.9	6.58
Top 12 Medicare items provided by vascular surgeons (excluding consultations)	37.7	7.54
Selected Medicare general surgery procedures <sup>a</sup>	-8.9	-1.78
Selected Medicare vascular surgery procedures <sup>a</sup>	-3.2	-0.64
Selected public hospital casemix general surgery procedures <sup>b</sup>	14.2	3.55
Selected public hospital casemix vascular surgery procedures <sup>b</sup>	-11.9	-2.98

Note: a - 1991-92 to 1995-96; b - 1991-92 to 1994-95.

Source: DHFS

### Issues Affecting Workforce Size

In order to assess the impact of particular issues on general/vascular surgery a pseudo-delphi questionnaire was sent to 52 selected general surgeons. The questionnaire listed issues that may have an affect on future general surgery workforce requirements. These general surgeons were asked to score the impact of these issues as follows: major decrease, 1; minor decrease 2; no change 3; minor increase, 4; and major increase, 5. The questionnaire had a response rate of 80.8%. The summary score of all trends, given organisational, social and economic constraints that are likely to occur, was 3.8; indicating that general surgeons consider that organisational, disease/injury, and technological trends will together require a minor increase in the general surgical workforce.

Taking into account all potential factors, general surgeons were asked to estimated the required change in the size of the general surgery workforce to be an increase of 2.6%

per annum.

The Working Party feels the estimate of 2.6% per annum is too high, given the service trends in the major general surgery procedures. In part this is probably due to the delphi participants not having the information on the procedural trends before them when they completed the questionnaire.

A detailed summary of the pseudo delphi results is included at Appendix C.

Respondents to the RACS/AMWAC survey were also asked to indicate whether they believed particular factors would increase workforce requirements, decrease workforce requirements or whether requirements would stay the same.

The most important issues that respondents considered would increase general surgery workforce requirements was the ageing of the population (84%), patient expectations and knowledge (62%), the need for more defensive medicine (59%) and increasing specialisation in general surgery (46%) (Table B9, Appendix B).

## **PROJECTIONS OF SUPPLY**

### **Entry into the Workforce**

Over the past seven years, an average of 32 new general surgeons have entered the workforce each year (Table 35). Over the next few years the number of new general surgeons is likely to be a little higher than this average, given the greater number of advanced trainees (Table 34). The Working Party estimates that, on average, in each of the next three years 42 new general surgeons will enter the workforce.

Almost all general surgery trainees complete advanced training. However, there are some leakages to other surgical specialties. This leakage is variable and difficult to precisely quantify, but there will be a loss of several general surgeons from the specialty each year. Anecdotal evidence from several States suggests that this leakage may be gathering some momentum and accordingly trends will need to be monitored over the next few years.

### **Retirements**

In the RACS/AMWAC survey 44.5% of respondents (n 211) provided an indication of their retirement intentions; 46.5% of respondents indicated that they would retire at 65 years, 31.7% of respondents indicated they intended to retire before 65 years, 18% of respondents felt they would retire between 65 and 70 years and 3.8% of respondents indicated they intended to work beyond 70 years (Table B8, Appendix B). On balance it would seem that the use of 65 years as a suitable retirement age is appropriate for projection purposes.

If the retirement intentions of the respondents to the survey are indicative of the intentions of the workforce as a whole, a sizeable number of general/vascular surgeons can be expected to leave the workforce over the next ten years. Table 14 shows that there are currently 474 general/vascular surgeons aged 55 years and over, representing 38.7% of the workforce. If all of these surgeons retired over the next ten years this would represent an average loss of 47 surgeons per year.

Medicare data indicates there are 219 general/vascular surgeons over 60 years of age. If all of these surgeons retired over the next five years this would represent an average loss of 44 surgeons per year (see Table 11).

### **Female Participation in the Workforce**

It is expected that the proportion of women in general surgery will increase both because of an expected increase in the number of female trainees and as the 55 years and over cohort of general/vascular surgeons retire. Currently, women represent 3.1% of the current general surgery workforce but 13.6% trainees and there are no female surgeons in the 55 years and over age cohort.

Generally, female specialists have a lifetime working contribution which is 75% of the male contribution. For female general surgeons the lifetime contribution is estimated at 68% of the male general surgeon lifetime contribution (AMWAC & AIHW 1996).

### **Overseas Trained Surgeons**

Specialist general/vascular surgeons entering the Australian workforce through the Australian Medical Council specialist college pathway are expected to be small and to have a minimal effect on overall workforce supply. Between 1990 and 1996 only 25 overseas specialist surgeons were registered, 29 were rejected and 42 were asked to undergo further training and examination (AMC 1996). These figures are for all surgical specialties not just general/vascular surgeons and they clearly indicate that the number of surgeons entering through this pathway is small.

There may also be a small number of general surgeons who emigrate, but overall the Working Party felt in the balance between immigration and emigration there would be a net gain of several overseas trained general surgeons per year.

### **Provision of Services in Rural and Remote Areas**

A significant number of general surgeons are located in rural areas (23.3% of the workforce) and as a result the distribution of general surgeons is better than for most specialties. In addition, 14% of urban respondents to the RACS/AMWAC survey indicated they provided outreach services to rural communities.

However, despite these comparatively encouraging figures, the Working Party believes young general surgeons still need to be encouraged to consider rural practice; and rural training opportunities need to continue and be expanded where appropriate.

To help gain an insight into why rural general surgeons undertake rural practice the RACS/AMWAC survey asked resident rural general surgeons to indicate their main reasons for establishing a specialist rural practice. Almost universally they nominated the rural lifestyle and the variety of work as the main reasons for choosing a rural location. 32% of rural respondents indicated they came from the country. The main requirements for a successful rural practice were given as good local hospital facilities and a public hospital appointment, a reasonable catchment area, and access to support from colleagues. 15% of rural respondents indicated they would make use of a specialist locum service if it was established, with the majority of those interested indicating a requirement of between four and six weeks of locum support.

The Working Party also believes that in some situations it will not be possible for resident, or even regular visiting, specialist services, and as a result basic general surgery services will need to be provided by a general practitioner. Essentially, this will be in the smaller rural and more remote rural communities where there is insufficient workload and infrastructure to warrant recruitment of specialists. It will continue to be

important for general practitioners in these areas to obtain and maintain basic procedural skills.

### **Substitution**

Analysis of Medicare provider data makes it clear that most items in the general surgery segment of the Medicare Benefits Schedule are provided by a number of groups of practitioners. The dynamics of such shared provision are affected by geography and trends over time.

In rural areas a lesser proportion of the minor surgery is performed by general surgeons than in the major cities.

Trends over time have shown that general surgeons have decreased their share of activity in other surgical specialties such as vascular surgery, urology and orthopaedic surgery. General surgeons have slightly increased their share of activity in the modest surgical operations such as appendicectomy and hernia repair. It would appear however that there is a progressive shift of surgical work into more specialised hands.

Vascular surgeons are progressively performing an increasing proportion of arterial and venous surgery. Endoluminal arterial procedures provide an interface of responsibility with radiologists.

On balance, the trends in substitution towards and away from general surgery are producing a net of loss of activity to the specialty. However, the Working Party did not believe that any workforce intervention should be made in order to direct general/vascular surgery working patterns.

## BALANCING SUPPLY AGAINST REQUIREMENTS

### Requirement Trends

Over the next ten years the Australian population is expected to increase at an annual rate of 1.2% per annum. Ageing effects are estimated to be at least 0.4% above population growth.

The Working Party has estimated that between 1991-92 and 1994-95 general surgery requirements (Medicare and casemix) grew by an estimated 1-1.7% per annum. Continuation of this trend would support requirements projections equivalent to expected population and ageing growth or just below.

Table 44 shows the growth in requirements under three different growth assumptions starting from the 1996 requirements level; and ranging between growth in requirements of 1% per year to 2.6% per year.

The productivity of general/vascular surgeons as measured in hours worked will vary from time to time and by age group as not all surgeons work a uniform full time working week, so it is appropriate to measure services provided in hours instead of by head count. In 1996 the 1225 specialist general/vascular surgeons in the workforce provided an estimated total of 65,241 hours of services per week. The Working Party has concluded that the workforce is adequately meeting requirements, so it can be assumed that supply is approximately equal to present requirements.

The Working Party felt that the recently observed trends in services growth are likely to continue and perhaps even decline further in some general surgery areas. As a result, it is estimated that requirements will grow at 1% per annum.

**Table 44: Projected requirements for general surgery services; by hours worked per week, 1996, 2002 and 2007**

Year	Minimum services growth trend (1% per year)	Population growth and maximum services growth trend (1.6% per year)	Pseudo delphi growth (2.6% per year)
1996	64,856	64,856	64,856
2002	68,846	71,336	75,654
2007	72,357	77,229	86,014

Source: van Konkelenberg

## Supply Trends

The supply of general/vascular surgeons was projected by ageing the 1996 supply through each year of age, subtracting retirements and adding 42 new graduates per year to 2001 and 52 in subsequent years. In particular the supply trends over the next ten years will be dominated by the large cohort of surgeons aged 55 years and over and their progression through to retirement.

The number of general/vascular surgeons was converted to hours per week by applying the average number of hours worked to headcounts in each major age cohort. These projections show that supply will increase from the estimated current level of 65,241 hours per week to an estimated 68,036 hours per week in 2007 assuming average retirements; with an upper and lower projection range of 67, 598 hours and 68,543 hours per week (Table 45).

**Table 45: Projected supply of general/vascular surgery services, high, low and average retirement rates; by hours worked per week, 1996, 2002 and 2007**

Year	Low retirement rate	Average retirement rate	High retirement rate
1996	65,241	65,241	65,241
2002	66,997	66,601	66,257
2007	68,543	68,036	67,598

Source: van Konkelenberg

## Projected Balance

A balance in supply to match a continued growth rate in requirements of 1% per annum can be achieved by increasing the proposed number of graduates of the general surgery training program in 2002 from the current level of 42 per year to 52 per year. Under this scenario notional shortages are expected to peak at 2.9% in 2001 but for requirements and supply to move back towards balance thereafter (Table 46). Retirements and workforce participation assumptions should be monitored and the projections amended if new trends emerge.

**Table 46: General surgery graduate output needed to move projected supply into balance with projected requirements (1% growth per year); by hours worked per week, 1997 to 2007**

Year	Number of graduates	Projected supply	Projected requirements	Balance (shortage)	% shortage
1996	42	65,241	64,856	-385	-0.6
1997	42	64,856	65,504	648	1.0
1998	42	64,963	66,159	1,197	1.8
1999	42	65,312	66,821	1,509	2.3
2000	42	65,750	67,489	1,739	2.6
2001	52	66,194	68,164	1,970	2.9
2002	52	67,185	68,846	1,660	2.4
2003	52	68,130	69,534	1,405	2.0
2004	52	69,029	70,229	1,201	1.7
2005	52	69,892	70,932	1,039	1.5
2006	52	70,734	71,641	907	1.3
2007	52	71,568	72,357	789	1.1

Source: van Konkelenberg

The results of this projection work show that under the scenario presented in this report, the output of the general surgery training program should increase to 52 graduates per year by 2001. If the target of 52 graduates is desired an additional 40 general surgery advanced training positions would be required.

This is a large increase in training positions in a year and unlikely to be practical, although the RACS increased training positions by 21 in 1994. Therefore, the Working Party recommends a staged increase in training positions of 16 in 1998, 16 in 1999 and 8 in 2000. In terms of ability to effect increases in training positions, the staged scenario is preferable. It will also enable the projected trend in requirements to be monitored and the recommended increases in training positions adjusted if necessary. The staged increase will mean that in 2007 the projected shortfall in hours worked will be 1.6% not 1.1% as shown in Table 46.

Training positions should be increased proportionately less in the comparatively well endowed States of South Australia and Victoria and kept roughly in line with projected State/Territory population shares in 2006. In particular, emphasis needs to be given to increasing positions in Queensland and Western Australia as a priority. Increases in training positions in the Victoria/Tasmania program should be made in Tasmania initially.

## RECOMMENDATIONS

The Working Party recommends:

1. There be an increase in the number of funded general surgery training positions and trainees to match an expected future growth in requirements of 1% per year.
2. That State and Territory health departments undertake negotiations with the RACS for the establishment of 40 additional general surgery training positions; with the increases to be staged and distributed as shown in the following table:

**Table 47: Total and additional general surgery training positions; by State/Territory, 1996 to 2000**

State/Territory	Total 1996 (current)	Total 2000	Increase in 1998	Increase in 1999	Increase in 2000
NSW/ACT	58	75	7	7	3
Victoria/Tasmania	58	62	1	2	1
Queensland	32	43	5	5	1
SA/NT	13	15	1	0	1
Western Australia	15	21	2	2	2
<b>AUSTRALIA</b>	<b>176</b>	<b>216</b>	<b>16</b>	<b>16</b>	<b>8</b>

3. State/Territory based general/vascular surgery services working groups, comprising RACS and State/Territory department of health representatives, be organised to co-ordinate the establishment of the new training positions and to oversee the introduction of any short term measures they may feel are necessary to meet localised service shortfalls (recognising that the increased number of graduates will not make an effective contribution to the general surgery workforce until 2002).
4. That general/vascular surgery requirements and supply projections be monitored regularly so that they can be amended if new trends emerge.
5. That this monitoring be coordinated by the RACS and AMWAC and the results incorporated into the AMWAC annual report to AHMAC. AMWAC will provide all necessary support.

## APPENDIX A - RURAL AND REMOTE AREAS CLASSIFICATION

The RARA classification provides a means of identifying areas that are specifically urban, rural and remote (DHS 1994).

The classification divides local government areas into seven groups:

1. Capital city: the cities of Sydney, Melbourne, Brisbane, Adelaide, Perth, Hobart, Darwin and Canberra.
2. Other major urban: non capital city urban centres with a population greater than 80,000 or more, Newcastle, Wollongong, Queanbeyan (as part of Canberra-Queanbeyan), Geelong, Gold Coast-Tweed Heads, Sunshine Coast, Cairns, Toowoomba, Townsville and Launceston.
3. Rural major: these are either statistical local areas with a minimum population of 20,000 in New South Wales and Victoria, 18,000 in Queensland, or 14,000 in the other States and Territories; or urban areas with a density of 30 or more people per square kilometre and a population of at least 10,000 in New South Wales and Victoria, 9,000 in Queensland, or 7,000 in the other States and Territories.  
Examples of rural major communities include Albury, Coffs Harbour, Dubbo, Orange, Tamworth in New South Wales; Ballarat, Bendigo, Horsham, Shepparton, Warrnambool in Victoria; Bundaberg, Dalby, Mackay, Rockhampton in Queensland; Mount Gambier, Port Augusta, Whyalla in South Australia; Albany, Bunbury, Geraldton in Western Australia; and Devonport, Wynyard in Tasmania.
4. Rural other: rural communities that are not major or remote, generally they are rural communities that are within a few hundred kilometres of a capital city or major urban centre.
5. Remote major: these are communities that have the same population and population density as major rural communities but are more than a few hundred kilometres from a capital city or are usually separated from other major centres by a significant physical barrier - Broken Hill in New South Wales; Mildura in Victoria; Mount Isa in Queensland; Port Lincoln in South Australia; Carnarvon, Esperance, Kalgoorlie, Port Headland, Roebourne in Western Australia; Alice Springs, Katherine in the Northern Territory.
6. Remote other: communities that are less densely populated than other

rural communities, hundreds of kilometres from a major urban centre and are usually separated from other communities by a significant physical barrier.

Examples of remote other communities are the local government areas of Bourke, Cobar, Hay, Lachlan, Walgett, Warren in New South Wales; Dimboola, Omeo, Orbost in Victoria; Barcaldine, Carpentaria, Longreach, Quilpie, Winton in Queensland; Coober Pedy, Lower Eyre Peninsula, Streaky Bay in South Australia; Broome, Coolgardie, Exmouth, Leonora in Western Australia; King Island, Lyell, Zeehan in Tasmania; Bathurst-Melville, Jabiru, Tennant Creek in the Northern Territory.

7. Offshore areas: includes all offshore areas that are not a local government area in their own right, offshore local government areas in their own right have been classified as remote.

## APPENDIX B: RACS/AMWAC SURVEY OF GENERAL AND VASCULAR SURGEONS, 1996

### METHODOLOGY

In order to assist with the establishment of a the profile of the general/vascular surgery workforce in Australia, a confidential survey of all members of the RACS Divisions of General/Vascular Surgery was conducted by AMWAC in consultation with the RACS. 475 Fellows responded to the questionnaire, which is a response rate of 39%. Of the 475 respondents, 32 indicated they had retired.

### RESULTS

#### Distribution of Respondents

Table B1 shows that the distribution of respondents to the RACS/AMWAC survey. The distribution of respondents is fairly similar to the overall distribution of RACS Fellows.

Table B1: RACS/AMWAC survey respondents, by State/Territory, 1996

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
respondents	148	139	72	37	30	15	2	443
% response	33.4	31.3	16.2	8.4	6.8	3.4	0.5	100.0

Source: RACS/AMWAC survey

#### Age Profile

From the RACS/AMWAC survey, the age range of respondents was from 32 to 82 with an average age of 50 years. The largest group of respondents was the 50 to 59 year age group (37.5%), followed by the 40 to 49 year age group (27.2%); 22.8% of respondents were aged 60 years and over.

#### Gender Profile

Eighteen (4%) respondents to the RACS/AMWAC survey were female and 425 (96%) respondents were male.

Female general surgeons tended to be younger than their male counterparts, with 65.6% aged under 45 years (compared to only 21% of male respondents).

## Training Qualifications

Of the respondents 450 indicated their year of qualification. The majority of respondents obtained Fellowship after 1970.

**B2: RACS/AMWAC survey respondents year of FRACS qualifications**

Year	Males	Females
1948-1959	17	-
1960-1969	74	-
1970-1979	149	-
1980-1989	130	6
1990-1996	62	12
<b>Total</b>	<b>432</b>	<b>18</b>

Source: RACS/AMWAC survey

## Main Surgical Sub Specialty

Respondents were asked to indicate their sub-specialty if any. The major areas of sub specialty were breast (27%), colorectal (24%) and upper GI (24%) surgery.

**B3: RACS/AMWAC survey respondents surgical sub specialty**

Sub specialty	Total		Female
	Total	%	Total
Breast	126	27.5	9
Colorectal	116	24.4	-
Endocrine	38	8.0	1
Upper GI	110	23.3	-
Urology	15	3.2	-
Vascular	62	13.1	2
Other	87	18.3	2

Note: some respondents indicated more than one area and as a result the total number of responses is greater than the number of survey respondents.

Source: RACS/AMWAC survey

Other sub specialties indicated by respondents included burns, cardio-thoracic, endoscopy, gastrointestinal, hand surgery, head and neck, melanoma and skin cancer, oncology, orthopaedics, paediatric, plastic surgery, renal transplantation, trauma and varicose veins.

## Practice Profile

The average number of operations performed per month by respondents was 38. This number was equally split between major and minor procedures. Male surgeons performed an average of 39 operations per month and female surgeons an average of 28 operations per month.

Respondents indicated that 50% of their patients were aged over 60 years. Paediatric work averaged 7.1% of respondents patients; young adult work (17 to 35 years) 14.3% and adult (35 to 60 years) comprised an average of 28.6% of respondents patients.

## Public Hospital Involvement

81% of respondents indicated that they had access to public hospital beds for the treatment of non-insured patients. Of these respondents 25% (119) indicated that their remuneration was fee for service, 48% (230) indicated they received sessional payments and 13% (63) indicated they were employed as full time salaried clinicians.

**Table B4: RACS/AMWAC survey respondents with access to public hospital beds; by State/Territory, 1996**

<b>State/Territory</b>	<b>% respondents with access</b>
New South Wales	87.2
Victoria	82.7
Queensland	77.8
South Australia	83.8
Western Australia	86.7
Tasmania	93.3
Northern Territory	100.0
<b>Australia</b>	<b>81.3</b>

Source: RACS/AMWAC survey

Respondents indicated that on average the number of public hospitals in which they worked was two. The number of sessions worked per week in public hospitals ranged from 4.5 in South Australia to 2.5 in the Northern Territory with national average of 3.3. 35.6% of respondents indicated that if extra funds were provided for public hospital sessions that on average they would provide 1.7 additional sessions.

**Table B5: General/vascular surgeons indicating a capacity to increase public hospital work; by State/Territory, 1996**

State/Territory	Able to increase sessions (%)	Average increase in sessions per week
NSW/ACT	43.9	1.4
Victoria	39.6	1.9
Queensland	19.4	1.5
South Australia	40.5	1.7
Western Australia	36.7	1.5
Tasmania	46.7	1.8
<b>Australia</b>	<b>35.6</b>	<b>1.7</b>

Source: RACS/AMWAC survey

### Consultation Waiting Times

The RACS/AMWAC survey collected information on surgeon consultation waiting times. The results are shown below and reveal that in general private patients are more expediently dealt with. The waiting times for an urgent condition are appropriately short. The waiting times for a disabling condition are too long in the public hospital system in Western Australia and Tasmania. However, overall, the Working Party felt that the results of the survey did not point to a shortage of general surgeons.

**Table B6: Average waiting time (days) for a first general surgical consultation, serious condition and major procedure, private rooms; by State/Territory 1996**

State/Territory	Standard consultation	Urgent condition	Major procedure, disabling condition
NSW/ACT	16	3	6
Victoria	8	2	6
Queensland	9	2	6
South Australia	9	2	6
Western Australia	15	2	7
Tasmania	8	1	8

Source: RACS/AMWAC survey

**Table B7: Average waiting time (days) for a first general surgical consultation, serious condition and major procedure, public; by State/Territory, 1996**

State/Territory	Standard consultation	Serious condition	Major procedure, disabling condition
NSW/ACT	7	2	27
Victoria	14	4	21
Queensland	33	6	21
South Australia	13	4	9
Western Australia	32	5	44
Tasmania	27	6	69

Source: RACS/AMWAC survey

### First Consultation

The average waiting times for a first consultation in private rooms ranged from 8 days in Victoria to 41 days in the Northern Territory.

The survey found it takes substantially longer to have a first consultation in a public outpatient unit than to have a private consultation in most States/Territories, with public consultation waiting times ranging from an average of 7 days in New South Wales to 33 days in Queensland.

In Victoria and Queensland public hospital waiting times were three times longer than waiting times for private patients. Waiting times for public hospital patients in Western Australia and South Australia/Northern Territory were more than twice as long as waiting times for private consultations.

### Patients Referred With an Acute Condition

The survey found that in most cases a patient referred with an acute condition would be seen on average within two days in private rooms and within three days in public hospital outpatients.

Average waiting times for patients referred with an acute condition in a public hospital ranged between two days in New South Wales to six days in Queensland. The average waiting times in a private facility ranged from one day in Tasmania to five days in the Northern Territory.

### Hospital Procedure

Respondents were also asked how long a patient would expect to wait for intervention for a disabling condition that requires a major procedure.

The survey found patients could expect to wait an average of six days for intervention in a private facility and 24 days in a public hospital.

Average waiting times for general surgery intervention in a public hospital ranged between nine days in South Australia and 69 days in Tasmania. The average waiting times in a private facility ranged from six days in South Australia to 14 days in the Northern Territory.

### **Metropolitan Practitioners Servicing Country Areas**

Respondents working in a capital city or a major urban area were asked if they also provided outreach services in rural areas. Of the 365 urban respondents 53 (14%) travelled to rural areas to provide services. These 53 respondents averaged 4.4 hours of rural outreach work per week.

Respondents gave the main reasons for servicing rural areas as:

- a community service
- enjoy the change and variety of work
- there was a definite need for such a service to be made available
- help minimise rural patients travelling to the city
- part of an established rural GPs network
- family contacts and or other interests in the area

### **Rural Practitioners**

128 respondents indicated that they lived and worked outside a capital city; of these 54 lived in a major urban area; 74 respondents lived and practised in a rural/remote area.

The main reasons for living and working in a rural area were given as:

- rural lifestyle
- variety of work
- came from the country
- good place to raise children

Other reasons included there was work available, needs for rural communities were greater, could not get work in urban areas, easier to establish a practice in a rural area, could join a practice with minimal outlay, as a migrant rural practice was all they could find at the time, saw rural areas as a growth area for surgical services.

Respondents indicated that the most important factors for a viable rural practice were:

- local hospital facilities
- a reasonable catchment area
- access to or support from other general surgeons
- a public hospital appointment

24% of rural respondents indicated they provided an outreach service to smaller rural catchments.

17% of non urban respondents indicated that if a specialty locum scheme were established they would make use of it. The majority of those interested indicated a requirement for between four and six weeks of locum support.

### Retirement

The RACS/AMWAC survey asked general surgeons over 50 years of age at what age they intend to retire. 44.5% of respondents provided details of their retirement intentions. 92.8% of respondents aged over 50 years gave an age of expected retirement which ranged from 60 years to 80 years with an average of 68 years. The highest ranking age of retirement (46.5%) for both males and females was 65 years. 31.7% of respondents indicated they intended to retire before 65 years, with most of these respondents intending to retire at 60 years (20.3% of total respondents). 18% of respondents felt they would retire between 65 and 70 years and 3.8% of respondents indicated they would retire after 70 years.

**Table B8: Actual year of intended retirement for general/vascular surgeons 50 years and over**

to 2002	2003-4	2005-7	2008-9	2010-11	2012-14	2015-17	2018-21	2022-26
10	4	43	9	98	11	27	5	3

Source: RACS/AMWAC survey

### General/Vascular Surgeons' Satisfaction

In the survey, 68% of respondents indicated they were satisfied with their workload, 25% felt they were over worked but only 10% considered that more general surgeons were required in their geographic area. In response to a question on capacity to increase workload, 38% of surgeons indicated they had time available to increase their operating time and 30% indicated time available to increase their consultative work.

**Table B9: General/vascular surgeons' satisfaction with workload, 1996**

<b>Indicator</b>	<b>% yes</b>	<b>% no</b>	<b>% no response</b>
Satisfied with workload	68	19	13
Overworked	25	47	28
Require more surgeons in your area	20	62	18
Require more general surgeons in your area	10	43	47
Require more anaesthetists in your area	24	33	43
Enough back up in you area	48	12	40
Insufficient surgery for adequate income	67	15	18
Insufficient surgery to maintain competence	9	73	18
Do you have time available to increase your practice activity in surgery	38	33	29
Do you have time available to increase your practice activity in consultations	30	34	36
Do you have time available to increase your practice activity in hospital work	25	34	41

Source: RACS/AMWAC survey

### **General/Vascular Surgeons' Perceptions of Factors Affecting Workforce Requirements**

Respondents were asked to indicate whether they believed particular factors would increase workforce requirements, decrease workforce requirements or whether requirements would stay the same.

The most important issues that respondents considered would increase general surgery workforce requirements was the ageing of the population (84%), patient expectations and knowledge (62%), the need for more defensive medicine (59%) and increasing specialisation in general surgery (46%).

**Table B10: General/vascular surgeons' perceptions of the factors that could affect the size of the general/vascular surgery workforce over the next ten years**

<b>Factors affecting the size of the workforce</b>	<b>% increase</b>	<b>% decrease</b>	<b>% stay the same</b>	<b>% no response</b>
Ageing of the population	84	0	8	8
Patient expectations/knowledge	62	1	28	9
More defensive medicine	59	7	26	8
Increasing specialisation	46	15	30	9
Technology	44	16	30	10
Health outcomes/quality assurance	44	5	37	14
Safer procedural practice	38	7	43	12
Expectations of health professionals	36	6	45	13
Disease patterns	35	9	44	12
Multi-disciplinary team approach	34	11	42	13
Geographic distribution of population	32	5	50	13
Geographic distribution of surgeons	28	12	45	15
Increased hospital productivity	27	14	48	11
Emphasis on hospital efficiency	25	17	44	14
Contracting of hospital services	21	23	41	15
Introduction of managed care	20	24	40	16
Access to beds, theatres, nurses	18	32	38	12
Public health resource allocation	16	27	42	15
Substitution of surgeons	10	23	54	13
Lifestyle changes	7	29	53	11

Source: RACS/AMWAC survey

## **APPENDIX C: GENERAL AND VASCULAR SURGERY PEUSDO DELPHI ANALYSIS**



## APPENDIX D: GENERAL SURGERY MEDICARE OPERATIONS

Appendix D contains the results of the detailed analysis of MBS general surgery and vascular surgery items.

Note that the Australian population has increased by 17.4% since 1984-85 and 4.6% since 1991-92.

**Table D1: Anal and rectal procedures (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
<b>Injection haemorrhoids</b>					
All doctors	-	4692	7125	-	51.8
General surgeons	-	4081	5497	-	34.0
% general surgeons	-	87.0	77.1	-	-
<b>Banding haemorrhoids</b>					
All doctors	13217	20895	20717	56.7	- 0.9
General surgeons	6666	14072	17736	166.0	26.0
% general surgeons	50.4	67.3	85.6	-	-
<b>Haemorrhoidectomy</b>					
All doctors	9070	8222	5959	- 34.3	-27.6
General surgeons	6378	6448	5450	- 14.62	- 15.5
% general surgeons	70.3	78.4	91.4	-	-
<b>Total anal and rectal operations</b>					
All doctors	15800	20432	20959	32.6	2.6
General surgeons	13016	17721	18195	39.8	2.7
% general surgeons	82.4	86.7	86.8	-	-

MBS items - injection haemorrhoids 32132; banding haemorrhoids 32135; haemorrhoidectomy 32138, 32141 (applied only in 1984-85 and 1991-92); all anal and rectal operations - 32094, 32095, 32096, 32099, 32102, 32105, 32108, 32111, 32112, 32114, 32117, 32120, 32123, 32126, 32129, 32131, 32138, 32141, 32142, 32144, 32145, 32147, 32150, 32153, 32156, 32159, 32162, 32165, 32166, 32171, 32174, 32175, 32177, 32180.

Source: DHFS

### Anal and Minor Rectal

1. Injection of haemorrhoids has increased markedly during the 1990s. This procedure is mainly performed by general surgeons.
2. Banding of haemorrhoids may have some number aberrations, given the large increase in procedures and the substantial increase in the number of procedures performed by general

- surgeons.
- Haemorrhoidectomy has decreased overall through the 1980s and 1990s. The numbers performed by general surgeons has also decreased, although general surgeons have increased their share for haemorrhoidectomy.
  - Anal operations attracting Medicare benefits increased, but this growth has been small in the 1990s.
  - General surgeons share of anal and rectal procedures has increased somewhat from the 1980s to the 1990s but remained constant through the 1990s.
  - It is estimated that 48% of anal operations attract Medicare benefits (see Table 31).

**Table D2: Appendix procedures (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	15219	10737	7484	- 50.9	- 30.3
General surgeons	11397	8540	5943	- 47.9	- 30.5
% general surgeons	74.9	79.5	79.4	-	-

MBS items 30571, 30572, 30573, 30574.

Source: DHFS

#### Appendicectomy

- The total number of appendicectomies (Medicare and AN-DRG public) appears to have fallen (see also Table 26 and Table 29).
- The number of operations attracting Medicare benefits has fallen considerably.
- The general surgeons share of appendix operations has risen slightly.

**Table D3: Breast operations (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	18644	25744	24149	29.5	- 6.2
General surgeons	15232	22697	19770	29.5	- 12.9
% general surgeons	81.7	88.2	81.9	-	-

MBS items 30333, 30334, 30337, 30338, 30341, 30342, 30345, 30346, 30349, 30350, 30353, 30359, 30364, 30361, 30363, 30364, 30366, 30367, 30369, 30370, 30372.

Source: DHFS

#### Breast

- Breast surgery attracting Medicare benefits has increased since 1984 but not in the 1990s.
- Breast surgery AN-DRGs (public) have increased markedly (see Table 29).
- The general surgery share of Medicare breast surgery has remained fairly constant.

**Table D4: Circumcision (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
All doctors	25895	20284	19033	- 26.5	- 6.2
General surgeons	2530	3219	2736	8.1	- 15.1
% general surgeons	9.7	15.6	14.3	-	-

MBS items 30650, 30653, 30656, 30659, 30660, 30663, 30666.

Source: DHFS

#### Circumcision

1. Circumcisions have declined overall through the 1980s and 1990s.
2. The general surgery share is small.

**Table D5: Colonoscopies (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
All doctors	17787	102696	165609	831.0	61.2
General surgeons	8330	40988	60288	623.7	47.0
% general surgeons	46.8	39.9	36.4	-	-

MBS items 32090, 32093.

Source: DHFS

**Table D6: Rigid sigmoidoscopies (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
All doctors	82898	96011	89315	7.9	- 9.0
General surgeons	44681	53852	58520	31.0	8.6
% general surgeons	53.9	56.0	65.5	-	-

MBS items 32072, 32075, 32078, 32081.

Source: DHFS

**Table D7: Flexible sigmoidoscopies (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
All doctors	10795	23881	23623	118.8	- 1.1
General surgeons	6582	13012	13547	90.6	4.1
% general surgeons	61.0	54.5	57.3	-	-

MBS items 32084, 32087.

Source: DHFS

**Table D8: Upper GI procedures (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
All doctors	75345	92573	204207	171.0	120.5
General surgeons	13468	21181	47520	252.0	124.3
% general surgeons	17.9	22.8	23.2	-	-

MBS items 30473, 30475, 30476, 30478, 30479, 30481, 30482, 30483, 30484, 30485, 30487, 30488, 30490, 30491, 30493, 30494.

Source: DHFS

#### Endoscopic Procedures

1. Overall endoscopic procedures attracting Medicare benefits have increased massively. This has been the case for procedures performed by all practitioners and those performed by general surgeons.
2. General surgeons perform the bulk of rigid sigmoidoscopies and flexible sigmoidoscopies, about half of the colonoscopies and less than a quarter of the upper GI endoscopies.

**Table D9: Gall bladder operations (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1993-94</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1993-1996</b>
All doctors	12188	17577	17218	41.3	- 2.1
General surgeons	11023	16741	16477	49.5	- 1.6
% general surgeons	90.4	95.2	95.7	-	-

MBS items 30443, 30445, 30446, 30448, 30449, 30454, 30455, 30457.

Source: DHFS

#### Gall Bladder Surgery

1. Gall bladder surgery attracting Medicare benefits has increased between 1984 to 1996, but 1993-96 declined slightly.
2. The AN-DRG (public) procedures have increased significantly between 1991-95 (see Table 29).
3. The vast majority of Medicare procedures are performed by general surgeons.
4. Around 42% of procedures attract Medicare benefits (see Table 31).

**Table D10: Gastric operations (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
<b>Ulcer operations</b>					
All doctors	940	242	177	- 81.2	- 26.9
General surgeons	830	213	151	- 81.8	- 29.1
% general surgeons	88.3	88.0	85.3	-	-
<b>Obesity surgery</b>					
All doctors	1286	706	441	-65.7	-37.5
General surgeons	1248	689	440	-64.7	-36.1
% general surgeons	97.0	97.6	99.8	-	-
<b>Other gastric surgery</b>					
All doctors	1434	1356	1124	- 21.7	- 17.1
General surgeons	1325	1234	1029	- 22.4	- 16.6
% general surgeons	92.4	91.0	91.5	-	-
<b>Anti reflux</b>					
All doctors	257	662	905	252.0	36.7
General surgeons	178	526	772	333.7	16.7
% general surgeons	69.3	79.5	85.3	-	-
<b>Hellers' operation</b>					
All doctors	26	38	47	80.8	23.7
General surgeons	15	18	37	146.7	105.5
% general surgeons	57.7	47.4	78.7	-	-
<b>Oesophagectomies</b>					
All doctors	..	238 <sup>a</sup>	249	-	4.6 <sup>b</sup>
General surgeons	48	157 <sup>a</sup>	167	248.2	6.4 <sup>b</sup>
% general surgeons	-	66.0	67.1	-	-
<b>Total gastric operations</b>					
All doctors	3943	3091 <sup>a</sup>	2943	- 25.4	- 4.8 <sup>b</sup>
General surgeons	3644	2745 <sup>a</sup>	2596	- 28.8	- 5.8 <sup>b</sup>
% general surgeons	92.4	88.8	88.2	-	-

MBS items - ulcer 30496, 30497, 30499, 30500, 30502, 30503, 30505, 30506, 30508, 30509; obesity surgery 30511, 30512, 30514; other gastric surgery 30515, 30517, 30518, 30520, 30521, 30523, 30524,

30526; ante reflux surgery 30527, 30528, 30529, 30530; Hellers= operation 30532, 30533; oesophagectomies 30535, 30536, 30537, 30538, 30539, 30541, 30542, 30544, 30545, 30547, 30548, 30550, 30551, 30553, 30554, 30556, 30557, 30559, 30560. a. 1993-94; b. 1993-1996; . . not available.

#### Gastric Surgery

1. Except for anti-reflux surgery there has been a massive decline in procedures which attract Medicare benefits.
2. General surgeons perform the bulk of gastric surgery.

**Table D11: Hernia operations (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	24507	30274	28106	14.6	- 7.2
General surgeons	15807	22694	22510	42.4	- 0.9
% general surgeons	64.4	74.9	80.0	-	-

MBS items 30609, 30612, 30614, 30615, 30616, 30617, 30620, 30621, 30624, 30403, 30404.

Source: DHFS

#### Hernias

1. Between 1984 and 1996 the number of hernia operations attracting Medicare benefits has increased, but during the 1990s the number of hernia operations has fallen.
2. AN -DRGs public procedures have increased markedly (see Table 29).
3. General surgeons have progressively increased their share hernia operations.

**Table D12: Various laparotomies (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	10167	10844	9158	- 10.0	- 15.6
General surgeons	7037	8274	7212	2.4	- 12.8
% general surgeons	69.2	76.3	78.7	-	-

MBS items 30373, 30375, 30376, 30378, 30379, 30381, 30382, 30384, 30385, 30387, 30388, 30394, 30395, 30396, 30397, 30399, 30400, 30402.

Source: DHFS

#### Laparotomies (adhesions, trauma, lymphoma, sepsis, fistula)

1. The number of laparotomies have decreased.
2. General surgeons have increased their share of the work a little.

**Table D13: Large bowel resections (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	4183	7413	7454	78.2	0.6
General surgeons	3621	6935	7074	95.8	2.0
% general surgeons	86.6	93.5	94.9	-	-

MBS items 32000, 32003, 32004, 32005, 32006, 32009, 32012, 32015, 32018, 32021, 32024, 32025, 32026, 32028, 32029, 32030, 32033, 32036, 32039, 32042, 32045, 32046, 32047, 32051, 32054, 32057, 32060, 32063, 32066, 32069.

Source: DHFS

#### Large Bowl Resections

1. The number of procedures attracting Medicare benefits has risen dramatically between 1984 to 1996, but only slightly in the 1990s.
2. General surgeons perform the bulk of the procedures.
3. AN-DRG (public) procedures have also increased (see Table 29).
4. Approximately 40% of all procedures attract Medicare benefits.

**Table D14: Renal operations, excluding biopsy (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	3930	4218	4166	6.0	- 1.2
General surgeons	176	110	69	- 60.8	- 37.3
% general surgeons	4.5	2.6	1.7	-	-

MBS items 36515, 36516, 36519, 36522, 36525, 36528, 36531, 36534, 36537, 36540, 36543, 36546, 36549, 36552, 36555, 36558, 36564, 36569, 36573, 36576.

Source: DHFS

**Table D15: Prostate biopsy procedures (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	1307	4493	15421	1080.0	243.0
General surgeons	48	58	51	6.2	-12.1
% general surgeons	3.7	1.3	0.3	-	-

MBS items 37215, 37218, 37219.

Source: DHFS

**Table D16: Prostate operations (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	8661	13892	11728	35.4	- 15.6
General surgeons	242	238	155	- 36.0	- 34.9
% general surgeons	2.8	1.7	1.3	-	-

MBS items 37200, 37203, 37206, 37207, 37208, 37209, 37212, 37221.

Source: DHFS

#### Urological Surgery

1. The general surgery contribution to urological surgery is minuscule.

**Table D17: Salivary gland procedures (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	1849	2202	1898	2.6	- 13.9
General surgeons	1129	1233	980	- 13.2	- 19.9
% general surgeons	61.0	56.0	51.6	-	-

MBS items 30249, 30250, 30253, 30256, 30259, 30262, 30265, 30266, 30269.

Source: DHFS

#### Salivary Gland Surgery

1. The number of procedures attracting Medicare benefits has declined in the 1990s.
2. The number of procedures performed by general surgeons has declined.
3. General surgeons share has of the work performed has decreased slightly.

**Table D18: Scrotal operations (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	10124	12982	10343	2.2	- 20.3
General surgeons	3626	3927	3045	- 16.0	- 22.5
% general surgeons	35.8	30.2	29.4	-	-

MBS items 30631, 30634, 30635, 30638, 30641, 30644, 37600, 37601, 37604, 37613, 37616, 37619.

Source: DHFS

#### Scrotal

1. Scrotal surgery attracting Medicare benefits has declined through the 1980s and 1990s.
2. General surgeons share of scrotal surgery has declined slightly.
3. AN-DRG (public) scrotal surgery has increased (see Table 29).

**Table D19: Thyroid and parathyroid procedures (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
All doctors	3253	3804	3920	20.5	3.0
General surgeons	2852	3401	3548	24.4	4.3
% general surgeons	87.6	89.4	90.5	-	-

MBS items 30295, 30296, 30297, 30298, 30306, 30307, 30308, 30309, 30310, 30313, 30314, 30315, 30317, 30318, 30320.

Source: DHFS

#### Thyroid and parathyroid

1. Procedures attracting Medicare benefits have increased between 1984 to 1996, but the increase has been smaller during the 1990s.
2. The general surgeons share has remained fairly constant around 90% of all procedures.

**Table D20: Amputations (Medicare), selected years 1984-85 to 1995-96**

Performed by	1984-85	1991-92	1995-96	% change 1984-1996	% change 1991-1996
General surgeons	395	376	297	- 24.8	- 21.1
Vascular surgeons	371	493	612	65.0	24.1
Orthopaedic	368	504	429	16.6	14.9
% general surgeons	34.8	22.6	22.2	-	-
% vascular surgeons	32.7	29.7	45.7	-	-

MBS items 5045, 5048, 44324, 44325, 44328, 44331, 44334, 44337, 44338, 44342, 44346, 44350, 44354, 44357, 44358, 44361, 44364, 44367, 44370, 44373, 44376.

Source: DHFS

#### Amputations

1. Amputations performed by vascular surgeons has increased dramatically.
2. Amputations performed by general surgeons has decreased dramatically.
3. The vascular surgeons share of the work is increasing, orthopaedic surgeons share remains constant and general surgeons share is declining.

**Table D21: Arterial aneurysms (Medicare), selected years 1991-92 to 1995-96**

Performed by	1991-92	1993-94	1995-96	% change 1993-1996	% change 1991-1996
All doctors	1343	1236	1322	7.0	- 1.6
General surgeons	110	71	88	23.9	- 2.0
Vascular surgeons	909	927	941	1.5	3.5
% general surgeons	8.1	5.7	6.7	-	-
% vascular surgeons	67.7	75.0	71.1	-	-

MBS items 33100, 33103, 33106, 33109, 33112, 33115, 33118, 33121, 33124, 33127, 33130, 33133, 33136, 33139, 33142, 33145, 33149, 33151, 33154, 33157, 33160, 33163, 33166, 33169, 33172.

Source: DHFS

#### Arterial Aneurysm

1. Number of operations attracting Medicare benefits is declining.
2. The number of operations performed by vascular surgeons is increasing.
3. The number of operations performed by general surgeons is decreasing.
4. The bulk of operations are performed by vascular surgeons.
5. The share of the work performed by general surgeons is declining.

**Table D22: Arterial bypass procedures (Medicare), selected years 1991-92 to 1995-96**

Performed by	1991-92	1993-94	1995-96	% change 1993-1996	% change 1991-1996
All doctors	3272	4125	2634	-36.1	- 19.5
General surgeons	209	125	105	-16.0	-49.8
Vascular surgeons	2173	2037	1874	- 8.0	-13.8
% general surgeons	6.4	3.0	4.0	-	-
% vascular surgeons	66.4	49.1	71.1	-	-

MBS items 32706, 32709, 32712, 32715, 32718, 32721, 32734, 32727, 32730, 32733, 32736, 32739, 32741, 32745, 32748, 32751, 32754, 32759, 32760, 32763, 32766, 32769.

Source: DHFS

#### Arterial Bypass

1. There is an aberrant number in 1993-94.
2. There has been a decline in the number of procedures attracting Medicare benefits in the 1990s.
3. Vascular surgeons perform the bulk of these procedures.
4. The share of the work performed by general surgeons is small and declining.

**Table D23: Carotid operations (Medicare), selected years 1991-92 to 1995-96**

Performed by	1991-92	1993-94	1995-96	% change 1993-1996	% change 1991-1996
All practitioners	1802	1840	2084	13.3	15.6
General surgeons	59	42	33	- 21.4	- 44.1
Vascular surgeons	1489	1437	1556	4.5	8.3
% general surgeons	3.3	2.3	3.0	-	-
% vascular surgeons	82.6	78.1	74.7	-	-

MBS items 32700, 32703, 33500, 33503, 33506.

Source: DHFS

#### Carotid Surgery

1. Carotid surgery attracting Medicare benefits has increased during the 1990s.
2. Vascular surgeons perform the bulk of carotid surgery, although their share of the work is declining slightly.

**Table D24: Vascular trauma and embolectomies (Medicare), selected years 1991-92 to 1995-96**

Performed by	1991-92	1993-94	1995-96	% change 1993-1996	% change 1991-1996
All practitioners	1486	1421	1484	- 0.1	- 0.1
General surgeons	142	122	118	- 16.9	- 17.6
Vascular surgeons	1067	1048	998	- 4.8	- 6.5
% general surgeons	9.6	8.6	8.0	-	-
% vascular surgeons	71.8	73.8	67.3	-	-

MBS items 33800, 33803, 33806, 33809, 33812, 33815, 33818, 33821, 33830, 33833, 33836, 33839, 33842.

Source: DHFS

#### Vascular Trauma and Embolectomies

1. The overall number of procedures attracting Medicare benefits is decreasing.
2. The number of procedures performed by vascular surgeons has declined.
3. The number of procedures performed by general surgeons has decreased markedly.
4. The bulk of procedures are performed by vascular surgeons, although their share of the work has declined slightly.

**Table D25: Varicose vein injections (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
All practitioners	5953	25511	47529	698.0	6.5
General surgeons	2076	3558	3865	86.3	8.6
Vascular surgeons	2644	7768	8679	228.2	11.7
% general surgeons	34.9	13.9	8.1	-	-
% vascular surgeons	44.1	30.4	18.2	-	-

MBS items 32500

Source: DHFS

**Table D26: Varicose vein operations (Medicare), selected years 1984-85 to 1995-96**

<b>Performed by</b>	<b>1984-85</b>	<b>1991-92</b>	<b>1995-96</b>	<b>% change 1984-1996</b>	<b>% change 1991-1996</b>
All practitioners	15188	20137	16443	8.3	- 13.3
General surgeons	7236	8698	5209	- 28.0	- 40.0
Vascular surgeons	4836	8348	8035	66.1	- 3.7
% general surgeons	47.6	43.2	31.6	-	-
% vascular surgeons	31.8	41.5	48.9	-	-

MBS items 32503, 32504, 32505, 32506, 32508, 32509, 32511, 32512, 32514, 32517, 32518, 32521, 32524, 32529, 32530.

Source: DHFS

### Varicose Veins

1. There may be some aberrant numbers in these tables.
2. Varicose vein injections attracting Medicare benefits have increased dramatically.
3. Varicose vein operations attracting Medicare benefits have increased between 1984 and 1996, but declined during the 1990s.
4. Both general and vascular surgeons share of varicose vein injections have decreased dramatically.
5. Vascular surgeons share of varicose vein operations has increased substantially. This has been match by a similar decline in the share of operations performed by general surgeons.
6. AN-DRG (public) varicose vein operations have increased (see Table 29).
7. Approximately 40% of varicose vein operations attract Medicare benefits.

**Table D27: Arm fractures (Medicare), selected years 1991-92 to 1995-96**

<b>Performed by</b>	<b>1991-92</b>	<b>1993-94</b>	<b>1995-96</b>	<b>% change 1991-96</b>
All practitioners	23896	44898	46594	95.0
General surgeons	177	295	292	19.2
% general surgeons	0.7	0.7	0.5	-

MBS items 47360 to 47466.

Source: DHFS

**Table D28: Lower limb fractures (Medicare), selected years 1991-92 to 1995-96**

<b>Performed by</b>	<b>1991-92</b>	<b>1993-94</b>	<b>1995-96</b>	<b>% change 1991-96</b>
All practitioners	21325	28037	29517	38.4
General surgeons	95	169	150	58.0
% general surgeons	0.4	0.6	0.5	-

MBS items 47474 to 47678.

Source: DHFS

**Table D29: Management of dislocations (Medicare), selected years 1991-92 to 1995-96**

<b>Performed by</b>	<b>1991-92</b>	<b>1993-94</b>	<b>1995-96</b>	<b>% change 1991-96</b>
All practitioners	6544	6926	7593	16.0
General surgeons	80	64	69	15.7
% general surgeons	1.2	0.9	0.9	-

MBS items 47000 to 47072.

Source: DHFS

**Table D30: Management of hand fractures (Medicare), selected years 1991-92 to 1995-96**

<b>Performed by</b>	<b>1991-92</b>	<b>1993-94</b>	<b>1995-96</b>	<b>% change 1991-96</b>
All practitioners	23896	26567	26673	11.6
General surgeons	95	187	227	139.0
% general surgeons	0.4	0.7	0.8	-

MBS items 47300 to 47357.

Source: DHFS

### Fractures and Dislocations

1. General surgeons perform very little of this work.

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