MEDICARE SCHEDULE REVIEW BOARD

Remuneration Rates Study

FINAL REPORT

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Glossary of Abbreviations and Terms

ABS	Australian Bureau of Statistics
ACEM	Australasian College of Emergency Medicine
AIHW	Australian Institute of Health and Welfare
ASCO	Australian Standard Classification of Occupations
AMA	Australian Medical Association
$AUD	Australian Dollars
The Board	Commonwealth/Australian Medical Association Medicare Schedule Review Board
CE	Continuing Education
CME	Continuing Medical Education
The Department	The Commonwealth Department of Health and Aged Care
ED	Emergency Department
$\mathbf{E_p}$	Remuneration reference rate expressed in dollars per hour
$\mathbf{E_{gp}}$	Remuneration reference rate expressed in dollars per hour
$\mathbf{EW_{gp}}$	Remuneration reference rate expressed in dollars per unit of work
FACEM	Fellow of the Australasian College of Emergency Medicine
FRACGP	Fellow of the Royal Australian College of General Practitioners
FRACS	Fellow of the Royal Australian College of Surgeons
FTE	Full time equivalent
GMST	General Medical Services Table
GPMRG	General Practice Monitoring and Reference Group
GPWVPS	General Practice Work Value Points Study
HECS	Higher Education Contribution Scheme
HIC	Health Insurance Commission
HMA	Healthcare Management Advisors

JES	Job Evaluation System
MBS	Medicare Benefits Schedule
MCED	Mercer Cullen Egan Dell
NPV	Net Present Value: The value obtained when a future stream of income is converted to the lump sum that could be invested now at a set rate (the discount rate) to return the future income stream
OECD	Organisation for Economic Cooperation & Development
PCS	Practice Costs Study
PPP	Purchasing Power Parity
PRS	Professional Relativities Study
RACGP	Royal Australian College of General Practitioners
RACP	Royal Australasian College of Physicians
RGRR	Reference Group on Remuneration Rates
RRMA	Rural, Remote and Metropolitan Areas
RRS	Remuneration Rates Study
RVS	Relative Value Study
The Taskforce	Commonwealth/Australian Medical Association Medicare Schedule Review Taskforce
TER	Tertiary Entrance Ranking
VMOs	Visiting Medical Officers
VR	Vocational Registration

Executive summary

The Remuneration Rates Study (RRS) is one of the three major studies that were undertaken as part of the Relative Value Study (RVS) overseen by the Medicare Schedule Review Board (the Board). The RRS consisted of three significant quantums of work. The first and smallest component of the work supported the selection of the reference category of doctors, for which the remuneration reference rate was to be developed. The second and largest component of the work supported the determination of the remuneration reference rate. The third component of the work derived index numbers that took account of human capital factor differences between doctors in the reference group and all other in-scope doctors, and would have allowed remuneration rates for the other categories of doctor to be calculated from the remuneration reference rate.

Consistent with Board's decision, this final study report prepared by Healthcare Management Advisors (HMA) does not recommend the fair and reasonable remuneration rates for doctors. The report completely sets out the methodology for determining the remuneration reference rate and the associated index numbers. It also presents worked examples of the method for illustrative purposes (all illustrative data are calculated as close as possible to December 1999). As with any modelling approach, there were areas where key assumptions needed to be made to parameterise the models. In some of these areas there was disagreement within the Board on how and/or whether particular factors should be included in the models. These areas are highlighted in this report as "disagreed matters" and, as per the Board's directive, HMA has not expressed any view on these matters.

SELECTING THE REFERENCE CATEGORY

The process of selecting the reference category of doctor for which the remuneration reference rate was to be calculated commenced by agreeing, through discussion with the Board, a short-list of four categories of doctor for detailed evaluation, as follows:

- general practitioners;
- consultant physicians;
- urban general practitioners; and
- urban general physicians.

Information on the four groups of doctors against each of the eleven evaluation criteria was collected, reviewed and evaluated. As a result of this process, the all GPs group was chosen as the reference category of doctor.

DETERMINING THE REMUNERATION REFERENCE RATE

The methodology for determining the remuneration reference rate was based around the development, in parallel, of comparative remuneration data in three major areas as follows.

- The development of standardised career models for whole of life earnings for selected (non-medical) professional groups. Building these models required a measure of the similarity of work between GPs and other professionals. The measure used, known as

work value points, was provided by Mercer Cullen Egan Dell (MCED), the remuneration sub-consultants to the RRS. As no existing data on work value points for GPs were available, measuring the work value points for GPs became a major part of the RRS.

- The generation of reference data on the remuneration of doctors in the public sector.
- The generation of reference data on the remuneration of overseas doctors (GPs or their equivalents) by examining a range of published datasets, largely from OECD countries.

The process of moving from deriving the three datasets through to the determination of the remuneration reference rate for GPs was complex. Of necessity, the process mixed quantitative analysis with qualitative judgements to determine a fair and reasonable remuneration reference rate for GPs. The detailed career earnings models needed to be interpreted in conjunction with the higher level (broader) remuneration data for public sector and overseas doctors to produce the remuneration reference rate.

Choosing the other professional groups

The other (non-medical) professional groups were carefully chosen using clear criteria that searched for similarity between the intellectual capital factors of practitioners in those groups with intellectual capital factors for GPs, whilst having regard to practical factors such as the availability of remuneration data. Using a two-phase evaluation process the five other professional groups selected for the development of standardised career models were:

- Engineers;
- Lawyers;
- Accountants;
- Chemists; and
- Geologists.

Developing a standardised career model for GPs

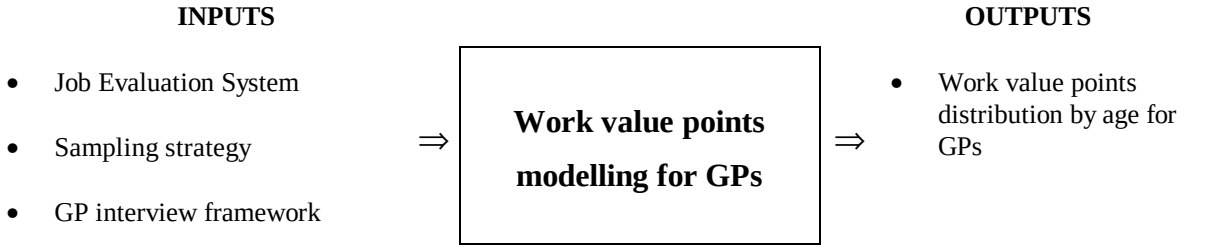
The career model for GPs provided the basis for calculating the whole of life earnings for GPs using market rates of pay for the other (non-medical) professional groups. The career model was designed to specifically take account of a range of intellectual capital factors including:

- the pre-fellowship, fellowship and post fellowship training periods;
- typical hours required for continuing medical education (CME);
- standardised practice hours (40 hours per week);
- standardised career entry and exit ages; and
- typical earnings through the training period.

Developing the work value points model for GPs

This part of the work became known as the General Practice Work Value Points Study (GPWVPS). In order to generate the data necessary to build the career models, the distribution of work value points by age for GP roles was required. Figure 1ES illustrates the key inputs to the process of finding the work value points distribution by age for GPs.

Figure 1ES: Finding the work value points distribution for GPs



The Job Evaluation System (JES) developed by MCED, and a number of similar systems in the remuneration consulting industry, assigns work value points based on an assessment of three primary factors relating to each job, not the job's occupant. It is the work value of a job that is being evaluated, not the performance of the person doing the job. The work value points score assigned to each job reflects the *"value"* of the work being done. The process involves the preparation of a detailed job description for the position under evaluation. Work value points for the position are then determined by the assessment of the job description against three primary factors of *"expertise"*, *"judgement"* and *"accountability"*.

To give effect to the JES, a sample of GPs was selected for interview. The sampling strategy was determined, within a limitation of sixty sample points to balance age, location (state and rurality), and gender. The sampling process generated the data to allow a curve-fitting approach to be used to determine the distribution of work value points by age (thereby estimating the values for the age groups that could not be directly sampled). Table 1ES presents the mean, standard deviation and 95% confidence interval by age cohort derived from the quadratic curve fitted to the sixty sample data points.

Table 1ES: Population-weighted estimates of work value points for GPs by age cohort

Age cohort	Mean	95% confidence interval	
		Lower bound	Upper bound
25-29 years	540.2	498.2	582.3
30-34 years	578.8	554.3	603.4
35-39 years	608.8	585.2	632.4
40-44 years	630.2	602.5	658.0
45-49 years	643.0	614.6	671.4
50-54 years	647.2	621.7	672.7
55-59 years	642.8	616.3	669.3
60-64 years	629.8	587.6	672.1
Total	629.7	609.0	650.4

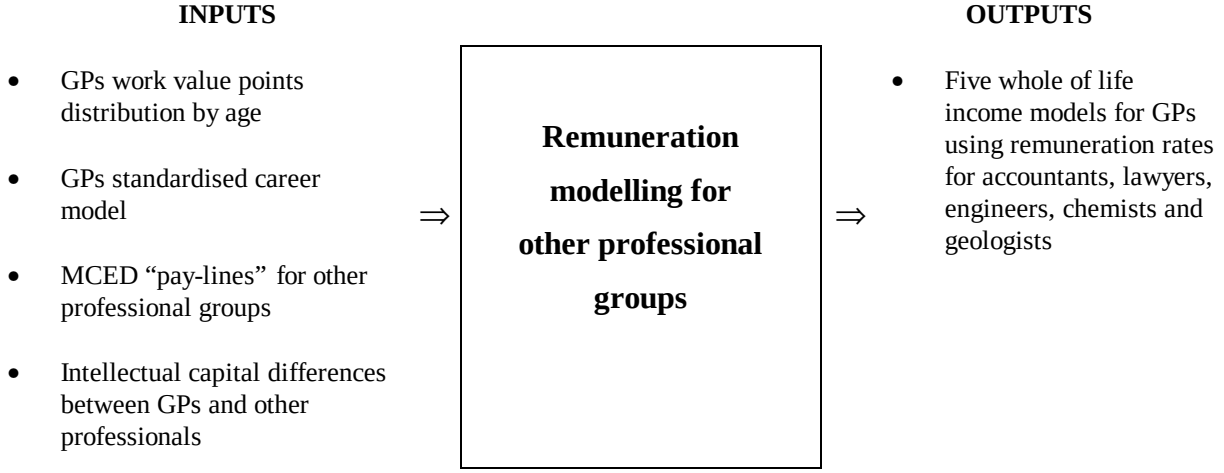
Review of the data showed that the GPWVPS demonstrated variability in the value of GP work as measured by the JES. This variability was in a narrower range than for other professionals but it was still perhaps higher than anticipated. Nevertheless, the data provided reasonably reliable estimates of the mean work value points in each age cohort. By way of comparison, the JES typically produces work value scores for professional positions in the range from 250 to 1,000 points. The 250 point level reflects an entry level graduate position and 1,000 points applies to a professional position requiring an international *"guru"* in the

professional discipline. Work value points scores for all but the top 1-2% of positions occupied by professionals range between 250 and 730 points.

Remuneration models for other professional groups

The career models were developed for each selected other professional group using the GP career path with the earnings levels applicable to practitioners in each group with doing work of similar value to GPs (as measured by work value points). Figure 2ES illustrates the key inputs to, and outputs from, the process of developing the standardised career models. Although the five other professional groups (accountants, lawyers, engineers, chemists and geologists) were selected on the basis of having comparable intellectual capital characteristics to doctors (and with regard to the availability of remuneration data), none of these groups is a perfect comparison group for GPs. In fact, the work on the RRS revealed that there were no perfect comparator groups.

Figure 2ES: Remuneration modelling for the other professional groups



As part of the remuneration modelling process a number of intellectual capital factors that were not directly (or adequately) taken into account by the JES were identified (JES was never designed to take account many of the identified factors). Nevertheless, the presence of these factors meant that the work value points attributed to a job could not alone determine the "right" remuneration for that job. For every work value points number for a given profession there were a range of remuneration levels in the market place. Given the work value points distribution for GPs it was still necessary to decide at which remuneration level to link a GP with the same work value points number as a practitioner in another professional group.

The MCED *"pay-lines"* modelled the relationship between work value points and remuneration for other professional groups. The lines were derived from market data obtained by MCED. For a given percentile (the 25th, 50th and 75th percentiles were used) the line represents the best fit (least squares regression) between the work value points and remuneration. In using the pay-lines, the data source from which they were derived needs to be carefully considered. MCED had the largest database on the remuneration of professionals in Australia. Nevertheless, the database was drawn largely from MCED clients, which were not statistically representative of the total Australian labour market. Specifically, MCED advised that the pay-lines provided were likely to overestimate the true market medians for the professional groups that were under consideration.

Using the pay-lines, judgements could be made about the most appropriate level to choose when comparing GPs to each other professional group. It is likely that a different choice is appropriate for each professional group (e.g. the 50th percentile may be appropriate for lawyers but the 75th percentile may be appropriate for geologists). The key consideration in choosing the pay-lines is the impact of those compensable factors that were not adequately taken into account by the JES work value points (became known as the *"super-added"* factors).

By working with the General Practice Monitoring and Reference Group (specifically convened to oversee and advise on the GPWVPS) and conducting independent investigations, seven potentially compensable factors that may not have been adequately accounted for within the JES framework were identified. Following considerable work on each factor, the Board reached agreement on how three of the seven factors should be treated, but not the other four. Table 2ES summarised the status of each factor at the conclusion of the RRS.

Table 2ES: Status of super-added factors influencing the choice of pay-lines

Factor	Position
1 Length of training	Included in career models, agreed by Board
2 Cost of training	Included in career models, agreed by Board
3 Continuing education	Compensable, accounting method disagreed
4 Human management risk	Compensable, accounting method disagreed
5 Nature of GP work	Compensable, accounting method disagreed
6 Return on investment in intellectual capital	Compensable, accounting method disagreed
7 Intellectual capital on entry to undergraduate education	Not compensable, agreed by Board

As the Board could not agree on methods for dealing with the super-added factors, it was not possible to complete the development of the standardised career models. **For the purposes of illustrating the methodology the median pay-line for each comparator profession has been used.** By making this choice, a value for the remuneration reference rate that produces the same whole of life income for GPs as the standardised career model for each other profession can be found. Table 3ES presents these results for each comparator group.

Table 3ES: Remuneration reference rate generated by the comparator professions(1)

Comparator Profession	Career NPV	GP hourly equivalent(2)	GP annual equivalent(2)
Accountants	$1,355,437	$67.30	$123,826
Lawyers	$1,441,930	$72.42	$133,262
Engineers	$1,364,197	$67.82	$124,782
Chemists	$1,217,915	$59.15	$108,828
Geologists	$1,157,354	$55.55	$102,217
Chemists/Geologists	$1,169,806	$56.29	$103,576

(1) For illustrative purposes, the comparative data are based on the use of median pay-lines
(2) GP equivalent remuneration is based on Medicare income earned from personal exertion by working the standardised 1840 hour year, excluding profits or losses from other activities (e.g. engaging locums)

Table 3ES shows that the career models produced data in a fairly wide range, moving from an annual rate of $102,217 (geologists) to $133,262 (lawyers). The differences in remuneration for positions with similar work value points effectively estimated the differences in the labour markets for the other professions. In hourly rate terms, this range represents $55.55 using the geologists' model through to $72.42 per hour using the lawyers' model. **These figures are illustrative and do not include any adjustment for the super-added factors or data bias.**

Public sector doctors remuneration data

Doctors working in public hospital Emergency Departments providing care to undifferentiated patients without direct supervision were chosen as the best comparison group of public sector doctors. A survey of this group of doctors was designed and distributed with the cooperation and support of the Australasian College of Emergency Medicine (ACEM). The overall results of the survey showed that the income for the target group of public sector doctors was in a fairly narrow range. The representative income figure (mean or median) for doctors working fulltime in public hospital Emergency Departments was $149,000 per annum.

To allow more meaningful comparisons of the emergency physicians' data with remuneration levels for GPs, two subsets of the survey population were created. The first (subgroup one) focused on capturing full-time doctors who spent at least 50% of their time on patient care. The nature of Emergency Department work is that many doctors in the target group also spent significant amounts of their time supervising the work of interns, residents and registrars. For this reason, subgroup two was formed by taking all those doctors in subgroup one and further removing doctors with a high proportion of administrative work by excluding Departmental Directors and Deputy Directors from the analysis (subgroup two). Table 4ES presents the results for each survey group.

Table 4ES: Average and percentile annual incomes for public sector doctors(1)

Income measure	All Respondents	Subgroup 1	Subgroup 2
Average income	$148,578	$149,786	$142,578
25th percentile	$131,289	$140,072	$135,246
50th percentile	$149,117	$152,053	$149,397
75th percentile	$170,341	$167,022	$159,940

(1) Mainly Emergency Physicians holding FACEM qualifications working in public hospital EDs

Review of Table 4ES shows that an income range of $135,000 to $160,000 (25th to 75th percentile) represents a reliable estimate of the remuneration applicable to public sector doctors working in hospital Emergency Departments who had attained fellowship qualifications (that are most comparable to GPs). A range of factors, for which the impact could not be reliably quantified within the scope of the survey, need to be taken into account when using these figures as reference points as part of the process of setting the fair and reasonable remuneration reference rate for GPs.

Overseas doctors remuneration data

The focus of the international remuneration comparisons was on overseas doctors carrying out a similar role to that carried out by GPs in Australia. Large volumes of data were considered but there were very serious limitations on the use and presentation of the data because the associated definitions and timeframes are not consistent and comparable across countries.

Using the available data some useful comparisons between Australia and other countries and other countries were produced, as presented in Table 5ES.

Table 5ES: GP remuneration comparisons, various countries

Overseas Doctors	Annual earnings ($AUD)	Relative Index Value	Annual earnings (PPP)	Gatekeeper Role?
Australia[1,2,3]	$88,877	2.79	68,367	Yes
Finland[1]	$76,691	1.78	47,078	Yes
France[1]	$83,304	1.57	50,677	No
New Zealand[1,4]	$57,156	2.39	47,316	Yes
Norway[1]	$68,531	1.42	37,835	No
United Kingdom[1,5]	$110,737	2.59	69,505	Yes
United States[1]	$215,538	3.28	139,000	No

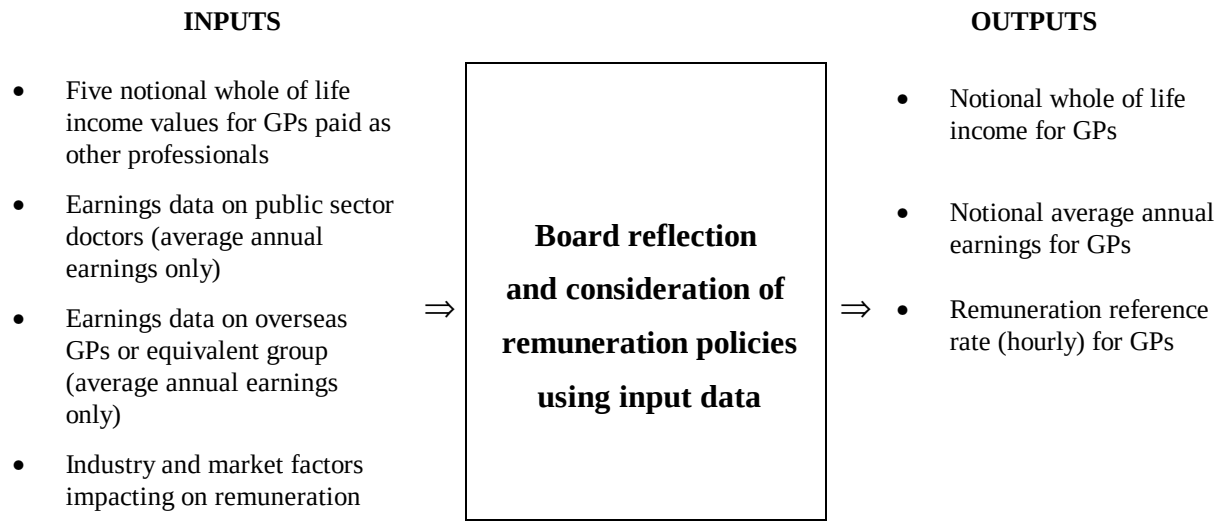
(1) OECD Health Data 99, OECD, Paris, 1999
(2) Australian Health Insurance Commission 1998/99
(3) Australian Bureau of Statistics, Employee Earnings and Hours 1998
(4) New Zealand 1996 Census Data
(5) RCGP Information Sheet No 5 April 1999 – Health Service Expenditure

Table 5ES shows that the results produced are largely as expected (the US being significantly different to other countries). The relative index value is the multiple of average weekly earnings earned by GPs, the PPP is a measure of the purchasing power of each country. The nature of the findings is such that they could not be expected to have any significant impact on setting the remuneration reference rate for GPs in Australia in the context of the RRS.

Calculating the remuneration reference rate

The key inputs into the process of calculating the remuneration reference rate were the career earnings models, the public sector doctors, and overseas doctors' remuneration data as illustrated in Figure 3ES.

Figure 3ES: Determining the remuneration reference rate



The decision on the notional whole of life income for GPs needed to be made from the five values obtained for whole of career earnings by using the market rates for the other professional groups. In taking this decision, the remuneration levels for GPs overseas and for

the relevant subset of public sector doctors working in Australia needed to be considered. The decisions made in this step reflect the Board's consideration of, and reflection on, a range of industry and market related factors that influence remuneration.

The standardised career models produced values for whole of life incomes for the comparator professions (standardised for GP work) based on market rates of pay prevailing around December 1999 (the Board's reference date). The purpose of considering industry and market factors impacting on remuneration was to attempt to measure the degree to which the observed remuneration rates (December 1999) may vary from the long-term market average. The JES process did not reflect the impact of industry and market factors (JES only measures work value). It was considered that putting the standardised career model results into the context of the prevailing market conditions at the time the data were extracted (December 1999) would assist in determining how the results of the standardised career models should be used to set the remuneration reference rate.

Accordingly, an analysis of industry and market factors was carried out specific to the comparator professions. The industry and market factors considered were:

- Industry capacity to pay;
- Demand for labour;
- Supply of labour;
- Competition for employment;
- Industry stability;
- Turnover of labour;
- Job security; and
- Availability of a career path.

In many areas the analysis was by necessity subjective and relied on a compilation of expert opinion rather than detailed empirical studies. Reliance on opinion was necessary as the type of analysis that was being carried out for the purposes of the RRS had no precedent that could be drawn upon. Overall, it was found that, in the context of the RRS, some of the industry and market factors were more relevant to setting the remuneration reference rate than others. All the factors considered are typically used (in addition to work value points) by organisations considering where to pitch their remuneration levels for particular jobs, relative to the market. By their nature the industry and market factors are related and therefore not mutually exclusive.

The analysis focused on considering the relationship between the market norm and the NPV of the standardised career model for each comparator group. The nature of the industry and market factors is that some of them suggest that the market norm remuneration would be above the outcome of the standardised career model for a given professional group, some indicate an outcome about equivalent, while others suggest a choice below. The Board was not able to reach agreement on the value of the analysis on the industry and market factors. Accordingly, the method for including this analysis in the determination of the remuneration reference rate became a disagreed matter.

The industry and market factor analysis left open the question of the relationship between the notional whole of life income for GPs (I_{gp}) and the market norm for the individual career models. A key issue still to be addressed is should I_{gp} reflect the approximate position of the market norm derived from the results of standardised career model, or should any other factors be used to influence the positioning of I_{gp} relative to the market norm? In reaching a final

decision on I_{gp}, the impact of the earnings of public sector doctors and the earnings of GPs (or equivalents) overseas also needs to be considered.

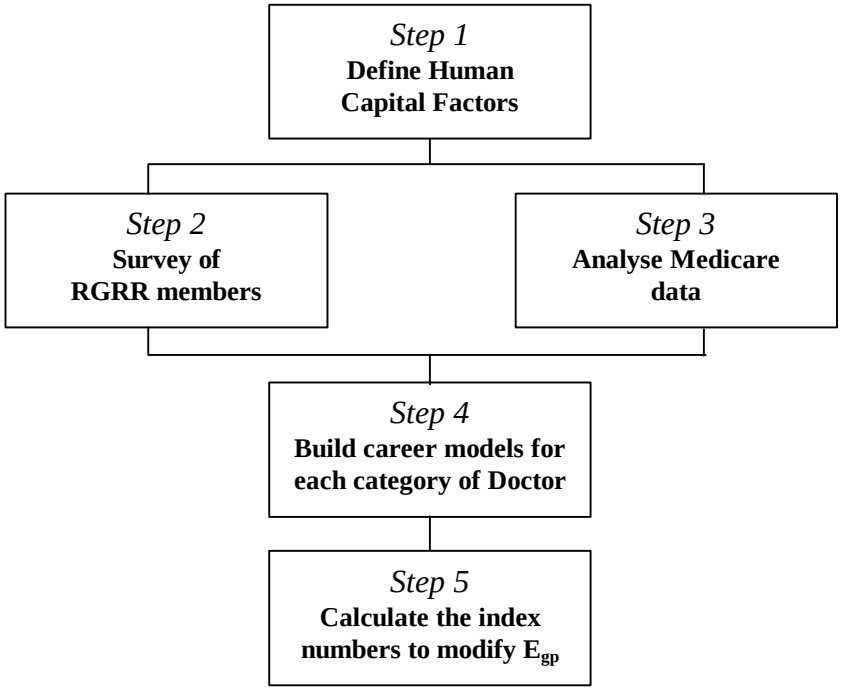
At the conclusion of this work a systematic process for producing a fair and reasonable value for E_{gp} that necessarily mixed quantitative analysis (the career models and the earnings comparisons) with qualitative judgements (the super-added, market and industry, and data bias factors) had been designed. The process did not yield an hourly rate due to a number of disagreed matters within the Board, particularly in relation to whether and how the qualitative factors might be used. Although outside the terms of reference of the RRS, a high level process for converting the hourly rate (E_{gp}) into a rate per unit of work (EW_{gp}) was also designed in response to a request by the Board. This method highlighted the need to take account of a number of non-human capital factors such as the average service mix for GPs and the opportunity for GPs to derive Medicare income from activities other than personal exertion (e.g. by employing locums to cover for periods of leave) in the calculations.

For the purposes of taking the analysis to the next step (to allow the calculation of the index numbers), it was assumed that I_{gp} should be around the market norm. By making this assumption, a reasonable interpretation of the remuneration data might be that (in hourly equivalent terms) E_{gp} should be between $65 and $75 per hour. **This result is illustrative, as the impact of the disagreed super-added factors, industry and market factors and the potential data bias have not been included. This remuneration range has, however, been used as a basis for illustrating the calculation of the index numbers.**

MEASURING HUMAN CAPITAL DIFFERENCES BETWEEN DOCTORS

The methodology for measuring the human capital factor differences between doctors was based around the development of standardised career models for the twenty-seven categories of doctor represented on the Reference Group on Remuneration Rates (which was convened to advise on, and review, the career models for doctors) as illustrated in Figure 4ES.

Figure 4ES: Methodology for measuring the human capital factor differences



The standardised career models were designed to quantify the impact of the different human capital factors applying to each doctor category. For example, the general surgeons' model generated an index on the remuneration reference rate (for GPs) that would result in general surgeons earning the same amount (in NPV terms) across their career as GPs. Importantly the models considered only intellectual capital factors (e.g. length and costs of training, requirement for CME) and not the differences in the work performed (as this was considered in the Professional Relativities Study) or the differences in the costs of being in practice (as this was considered in the Practice Costs Study).

Following development of the first draft models, the physician sub-specialty groups advised that they wished to be modeled as one homogeneous group. Accordingly, twenty career models were developed with the eight physician sub-groups being consolidated into one larger group. The principal information source for preparing the models was a survey of RGRR members (the "human capital factor survey"). This survey sought information on the typical progression of doctors in each category from undergraduate education through to retirement. Issues covered included the length of the fellowship training program, typical pre and post fellowship training periods, requirement for CME activities, and typical retirement ages. Throughout the whole process of developing the models the Board adopted the principle that typical, rather than minimum or average times, be used.

Results of the human capital factor survey were supplemented by a series of direct enquiries made to medical Colleges and the medical schools at Universities. The other major input into the career models was a comprehensive analysis of the Medicare database. First cross sectional data from 1998/99 were analysed to determine the number of in-scope doctors and their career earnings profiles. Longitudinal data from 1994/95 to 1998/99 were then used to examine issues such as the age at which doctors first accessed Medicare in their chosen specialty and the age at which they retired (including their retirement rate). These data analyses were designed to support and corroborate the information obtained through the human capital factor survey.

Human capital factors

Eight human capital factors that could potentially be included in the career models were identified. Table 6ES summarises the human capital factors considered for inclusion in the career models and the position on each. The Board reached an agreed position on all the human capital factors except the treatment of CME time input.

Table 6ES: Human capital factors considered for inclusion in career models

Factor	Position
1 Length of training	Included in career models, agreed by Board
2 Intensity of training	Included in career models, agreed by Board
3 Requirement for postgraduate training	Included in career models (to the extent supported by the data), agreed by Board
4 Continuing medical education	Four options developed for inclusion in career models, Board decided to defer decision
5 Career span	Included in career models and standardised where appropriate, agreed by Board
6 Career earnings pattern	Excluded from career models, agreed by Board
7 Retirement patterns	Included in career models (to the extent supported by the data), agreed by Board
8 Impact of work in lifestyle	Excluded from career models, agreed by Board

Building the career models for each category of doctor

The standardised career models were developed by defining six major phases over the course of a full medical career as follows:

- Undergraduate education;
- Pre-fellowship;
- Fellowship training;
- Post-fellowship;
- Independent practice; and
- Retirement.

Table 7ES summarises some of the key results of the career models. It presents the earliest, latest and average starting ages for entry into independent practice predicted by the career models. It also shows the average total time spent in training represented in the career models

for each medical category by combining the pre-fellowship, fellowship and post fellowship periods (for the purposes of this comparison undergraduate education is excluded).

Table 7ES: Independent practice entry ages and training times

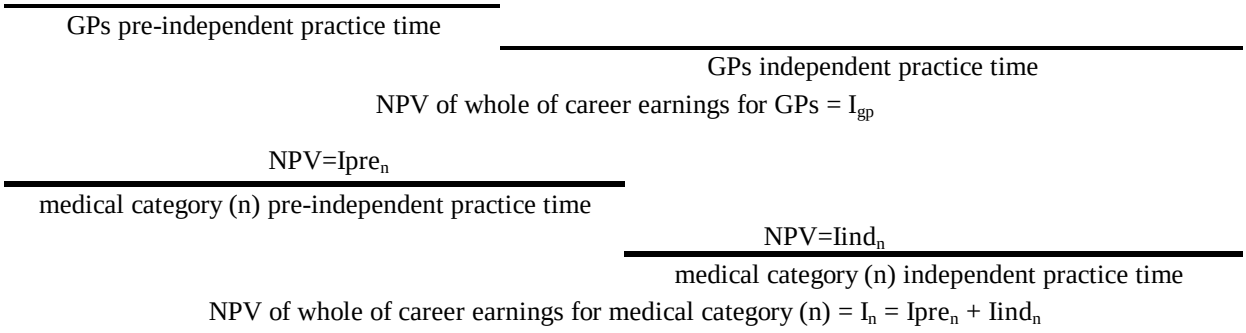
Medical Category	Model Minimum Starting Age	Model Maximum Starting Age	Model Average Starting Age	Average total training time (years)
Anaesthetists	31	37	34.4	10.1
Cardiothoracic Surgeons	35	40	37.1	12.7
Colorectal Surgeons	32	38	34.2	9.8
Dermatologists	31	38	34.0	9.6
Emergency Physicians	32	38	34.6	10.2
ENT Surgeons	31	38	34.2	9.8
General Surgeons	32	38	34.2	9.8
GPs	27	35	30.7	6.3
Neurosurgeons	33	40	36.2	11.8
Obstetricians & Gynaecologists	31	38	34.6	10.3
Ophthalmologists	31	39	35.0	10.6
Orthopaedic Surgeons	32	38	34.6	10.2
Paediatric Surgeons	34	40	36.2	11.8
Physicians	31	42	36.2	11.8
Plastic Surgeons	35	40	36.7	12.3
Psychiatrists	31	39	34.7	10.3
Radiation Oncologists	31	38	34.0	9.6
Rehabilitation Physicians	32	38	34.7	10.3
Urologists	33	38	35.1	10.7
Vascular Surgeons	35	40	37.2	12.8

The specialty that recorded the youngest age by which most of its doctors were in independent practice was GPs. The standardised career models provided for five of the surgical sub-specialties having a small proportion of Fellows that enter independent practice at age forty and for a small proportion of physicians to continue entering until age forty-two. The spread from the minimum to the maximum expected age for entering into independent practice was most commonly six to seven years. Physicians had the maximum age spread of eleven years. This spread was deliberately modeled, as this group exhibited the most variation, particularly in post fellowship training activities and time. The standardised career models also showed that GPs spent the least amount of time in training (6.3 years) and vascular surgeons the greatest amount of time (12.8 years).

Calculating the index numbers

The key principle underlying the index numbers model was that it produced the percentage loading that needed to be applied to the reference rate for GPs to enable specialists to earn the same amount as GPs (in NPV terms) over their entire career. The model adjusts only for the agreed intellectual capital factors. Figure 5ES illustrates the concept.

Figure 5ES: Career model comparison



This figure defines the net present value (NPV) of GP earnings over the course of the career as I_{gp}. It defines the NPV of pre-independent practice earnings of medical category (n) as $Ipre_n$, the NPV of independent practice earnings of medical category (n) as $Iind_n$, with the NPV of the whole of the career earnings being I_n. The hourly rate for medical category (n) is simply that which results in:

$$Ipre_n + Iind_n = I_{gp}$$

The career model assumptions and E_{gp} defined every variable in this calculation except for E_n. The formula can therefore be rearranged to calculate E_n. This approach increments E_{gp} to produce E_n (in theory E_n could be below E_{gp} but this situation does not occur in practice as GPs have the shortest training time). Put another way, the hourly rate for medical category (n) is calculated to ensure that any income lost (either through lower training income or lower available practice hours) by a doctor's decision to pursue further training (relative to a GP) rather than independent practice is regained over the course of a career through a higher hourly rate.

Illustrative index numbers

The results of using the index numbers model for the remuneration reference rate in the range \$65 to \$75 per hour are illustrated in Table 8ES. For the '*base model'* (where the remuneration reference rate is \$70 per hour) the results are shown in both index number and dollar terms. Review of the data showed a variation range, purely in terms of intellectual capital factors of 31% (1.00 for GPs to 1.31 for vascular surgeons). It also demonstrated that the range of percentage loadings narrows as E_{gp} reduces and expands as E_{gp} increases. This trend is consistent with expectations as increasing the remuneration reference rate has the effect of increasing the differential between GPs independent practice income and specialists training income. Because of their later entry into independent practice, specialists then have to earn at a higher rate to achieve the same lifetime income as GPs.

Table 8ES: Index number variations with E_{gp}

Medical Category	GP Reference Rate					
	$65	**$67.50**	**Base Model**	**Base Model**	**$72.50**	**$75**
Anaesthetists	1.17	1.17	1.18	$82.31	1.18	1.18
Cardiothoracic Surgeons	1.28	1.29	1.30	$91.03	1.31	1.32
Colorectal Surgeons	1.17	1.18	1.18	$82.77	1.19	1.19
Dermatologists	1.15	1.16	1.16	$81.46	1.17	1.17
ENT Surgeons	1.17	1.18	1.18	$82.83	1.19	1.19
Emergency Physicians	1.17	1.17	1.18	$82.54	1.18	1.19
General Surgeons	1.17	1.18	1.18	$82.77	1.19	1.19
General Practitioners	1.00	1.00	1.00	$70.00	1.00	1.00
Neurosurgeons	1.25	1.26	1.26	$88.54	1.27	1.28
Obstetricians & Gynaecologists	1.16	1.16	1.17	$81.85	1.17	1.18
Ophthalmologists	1.19	1.20	1.21	$84.41	1.22	1.22
Orthopaedic Surgeons	1.19	1.20	1.20	$84.19	1.21	1.21
Paediatric Surgeons	1.25	1.26	1.26	$88.55	1.27	1.28
Physicians	1.22	1.22	1.23	$86.30	1.24	1.25
Plastic Surgeons	1.28	1.29	1.29	$90.55	1.30	1.31
Psychiatrists	1.17	1.17	1.18	$82.43	1.18	1.19
Radiation Oncologists	1.17	1.17	1.18	$82.49	1.18	1.18
Rehabilitation Physicians	1.16	1.16	1.17	$81.92	1.18	1.18
Urologists	1.20	1.21	1.22	$85.09	1.22	1.23
Vascular Surgeons	1.29	1.30	1.31	$91.37	1.31	1.32

The base model assumed CME time input of 120 hours for GPs and 200 hours for specialists. This was one of the four CME input time modelling options. The others involved using the one band for CME time (all doctors have the same CME), three-bands (GPs 120 hours, physicians and ophthalmologists 230 hours, all other doctors 170 hours) and four-bands (GPs 120 hours, psychiatrists and anaesthetists 200 hours, physicians and ophthalmologists 230 hours, all other doctors 170 hours). As the Board decided not to choose from this options within the RRS, the effect of using all four options for the base model (E_{gp} of $70) is illustrated in Table 9ES. To assist with the interpretation of the data, the number and proportion of doctors (in-scope for the RRS) in each category as drawn from the Medicare database in 1998/99 has been included in the table.

Table 9ES: Index number variations CME time input option for the base model

Medical Category	Number of Doctors[1]	Proportion of total	CME time option (number of bands)			
			One	Two	Three	Four
Anaesthetists	2,022	6.5%	1.12	1.18	1.16	1.18
Cardiothoracic Surgeons	101	0.3%	1.24	1.30	1.28	1.28
Colorectal Surgeons[2]	81	0.3%	1.13	1.18	1.16	1.16
Dermatologists	298	1.0%	1.11	1.16	1.14	1.14
ENT Surgeons	329	1.1%	1.13	1.18	1.16	1.16
Emergency Physicians	91	0.3%	1.13	1.18	1.16	1.16
General Surgeons[2]	1,100	3.5%	1.13	1.18	1.16	1.16
General Practitioners	17,836	57.4%	1.00	1.00	1.00	1.00
Neurosurgeons	104	0.3%	1.21	1.26	1.24	1.24
Obstetricians & Gynaecologists	907	2.9%	1.12	1.17	1.15	1.15
Ophthalmologists	708	2.3%	1.15	1.21	1.23	1.23
Orthopaedic Surgeons	659	2.1%	1.15	1.20	1.18	1.18
Paediatric Surgeons	47	0.2%	1.21	1.26	1.24	1.24
Physicians	4,212	13.6%	1.18	1.23	1.25	1.25
Plastic Surgeons	223	0.7%	1.24	1.29	1.27	1.27
Psychiatrists	1,735	5.6%	1.13	1.18	1.16	1.18
Radiation Oncologists	146	0.5%	1.13	1.18	1.16	1.16
Rehabilitation Physicians	122	0.4%	1.12	1.17	1.15	1.15
Urologists	223	0.7%	1.16	1.22	1.20	1.20
Vascular Surgeons	111	0.4%	1.25	1.31	1.28	1.28
Total number of doctors	31,055	100%				

(1) Source Medicare database 1998/99

(2) General Surgeons numbers reduced by 81 Colorectal Surgeons as advised by the Colorectal Surgical Society of Australia

Review of the data in Table 9ES demonstrated that CME had a significant impact on the index numbers. As expected, use of either the three or four band system reduced the range of the index numbers from 1.00 - 1.31 for the two-band system down to from 1.00 - 1.28. The use of a single band produced the narrowest index numbers range from 1.00 to 1.25. In term of relativities between the groups, as expected the categories most affected by the three band system were physicians and ophthalmologists (increase in index numbers by 0.02 while the other categories index numbers typically reduce by 0.02 relative to the two-band system). In the four-band system psychiatrists and anaesthetists maintained their index numbers, physicians and ophthalmologists increased their index numbers by 0.02 while the other categories index numbers typically reduced by 0.02 relative to the two-band system.

1
Introduction

A review of the General Medical Services Table (GMST) of the Medicare Benefits Schedule (MBS) is being conducted by a joint Commonwealth/Australian Medical Association (AMA) Board (the Board) supported by a joint Medicare Schedule Review Taskforce (the Taskforce). Members of the Board and the Taskforce are listed in Appendix A. The review, commonly called the Relative Value Study (RVS) consists of three largely parallel streams of work, the Professional Relativities Study (PRS), the Practice Costs Study (PCS) and the Remuneration Rates Study (RRS). The framework for bringing these studies together is provided by the 'General Formula for Costing Medical Fees' (the general formula, see Appendix B).

Healthcare Management Advisors (HMA) was engaged to carry out the RRS in September 1998 and commenced work on the project in October 1998. HMA put together and managed a project team that drew together health economics, remuneration, medical, actuarial and statistical consulting expertise (members of the project team are listed in Appendix A). This document represents HMA's final report on the RRS.

1.1 REMUNERATION RATES STUDY

The principal purpose of the RRS, as expressed in the project brief provided to the consultants, was to:

> ***"calculate remuneration rates which may be used to convert assessments of work values or relative work value units to monetary values"***

As indicated by the statement of purpose, the RRS was designed to generate the remuneration rates to be used in conjunction with the relative value units derived from the PRS. By attaching a dollar value to professional work value units, and then combining the results of the PRS and the PCS, the fee for each item in the MBS can be calculated using the general formula (see Appendix B).

Underlying the RRS was the principle that fair and reasonable remuneration rates for doctors should be calculated relative to earnings of other professional groups in the community. Another important principle was that the RRS should not duplicate (double count) factors impacting on remuneration that had already been considered in either the PRS or the PCS. Thus the RRS was designed to concentrate on analysing "human" or "intellectual" (the terms are used interchangeably in this report) capital factors, such as costs and length of medical training rather than costs of being in practice such as rent or professional indemnity premiums (the PCS) or the time and intensity of work performed (the PRS).

To give effect to the fairness principle, there was no analysis of current Australian earnings of private sector doctors as part of the RRS. Rather, the RRS focused on generating remuneration data from external markets (ie markets that are not largely reliant on MBS fees for remuneration). The most important data were derived from models of what other professionals in Australia would earn if they were following career paths and performing work similar to medical work. Additionally, data were derived from examining remuneration levels for doctors working in the public sector in Australia and from examining the earnings of doctors in other countries.

All remuneration data presented in this report are calculated as close as possible to December 1999 (there is some variation to this principle for the overseas data, but much of these data are presented as ratios to average earnings, thereby largely eliminating the time value effect).

1.2 TERMS OF REFERENCE

The five specific terms of reference for the RRS were as follows:

(a) justify and select a category of doctor on which to establish a base remuneration reference rate from which to relate other categories of doctor accessing the MBS;

(b) establish an annual and an hourly remuneration reference rate for the selected category of doctor, specified in relation to the particular work undertaken by that category of doctor, as dollar amounts;

(c) identify the other categories of doctor to which different remuneration rates should apply;

(d) identify and quantify the factors which discriminate in terms of human capital eg training and working life, (but, excluding those factors already included in the professional component relativities) which distinguish between different categories of doctors and expressing those factors in the form of a percentage of the base rate for each category; and

(e) produce as a result of (a), (b) and (c) remuneration reference rates for use in the general formula which distinguish between different categories of doctors, specified as a dollar amount for each category of doctor.

As the study progressed it became clear that the major terms of reference were (a), (b) and (d). The work on terms of reference (c) and (e) was effectively absorbed into term of reference (d) and is therefore reported with that work.

As indicated by the terms of reference, the remuneration reference rate is the key product of the RRS. Throughout the study and in the general formula the remuneration reference rate is referred to as "E_p". Once the reference group had been determined as GPs the remuneration reference rate also became known as "E_{gp}". Both E_p and E_{gp} are used to refer to the remuneration reference rate in this report.

1.3 STUDY METHODOLOGY

The methodology for carrying out the study was very closely aligned to the principal terms of reference. In effect the study consisted of three major pieces of work. The first and smallest component of the work supported the selection of the reference category of doctors, for which the remuneration reference rate was to be developed. The second and largest component of the work supported the determination of the remuneration reference rate. The third component of the work derived index numbers that took account of human capital factor differences between doctors in the reference group and all other in-scope doctors, and allowed remuneration rates for the other categories of doctor to be calculated from the remuneration reference rate. Each of these three components of work are presented as separate chapters (2-4) and the technical methodology for each of these components is presented as part of the relevant chapter. A consultative framework was established to engage the medical profession in the project. The framework consisted of two reference groups as follows:

(1) **Reference Group on Remuneration Rates** (RGRR). The RGRR met seven times during the course of the project to provide advice to HMA on issues arising in the RRS. As well as reviewing the overall RRS methodology, the RGRR reviewed the rationale for selecting the reference category of doctor and the other (non-medical) professional groups to be used in remuneration comparisons. The key role of the RGRR was to advise on and review the career models developed for each medical category. Members of the RGRR also provided valuable data on behalf of their constituent subgroups that informed the development of these career models.

(2) **General Practice Monitoring and Reference Group** (GPMRG). The GPMRG also met seven times, specifically to oversee and advise on the General Practice Work Value Points Study (GPWVPS). The GPWVPS (see Section 3.4.1) produced work value points for a range of GP positions. The work value points were used to determine that subset of practitioners in the comparator professions whose work was most similar to GP work for use in the standardised career models. The GPMRG was involved in all stages of the GPWVPS in both a monitoring and advisory role.

1.4 REPORTING APPROACH

As indicated, this document presents HMA's final report on the RRS. It is written at a summary level to allow readers to quickly appreciate the work carried out and the results obtained. This summary report is supported by a series of resource materials that contain the detail of the work on each of the major steps in the methodology. Readers wishing to understand the detailed workings of any aspect of the RRS should consult the relevant resource document, as listed in Appendix E of this summary report.

It is important to highlight that this report does not reach the point of recommending fair and reasonable remuneration rates for doctors. The report sets out the complete methodology for determining the remuneration reference rate and the associated index numbers. It also illustrates the method by presenting worked examples. As with any modelling approach, there were areas where key assumptions needed to be made to parameterise the models. In some of these areas there was disagreement within the Board on how and/or whether particular factors should be included in the models. These areas are highlighted in this report as "disagreed matters" and, as per the Board's directive, HMA has not expressed any view on these matters.

2

Selecting the reference category

Term of reference (a) for the RRS required HMA to:

> **"justify and select a category of doctor on which to establish a base remuneration reference rate from which to relate to other categories of doctor accessing the MBS"**

2.1 METHODOLOGY

The process of selecting the reference category commenced by agreeing, through discussion with the Board, a short-list of four categories of doctor for detailed evaluation, as follows:

- general practitioners;
- consultant physicians;
- urban general practitioners; and
- urban general physicians.

The "general practitioners" group was defined as all vocationally registered GPs. The principal location of practice of the doctor (where the doctor provides the most services and/or earns the most revenue) defined urban GPs as a subset of GPs. Using the standard Health Insurance Commission (HIC) definition, urban included areas such as Newcastle, Gold Coast, and Wollongong.

The consultant physician group included all Fellows of the Royal Australasian College of Physicians (billing using items 110, 116 and 119 on the current MBS) except consultants in paediatric medicine. The urban general physician group was defined as a subset of the consultant physician category by choosing the consultants in internal medicine practising in urban areas.

The evaluation methodology is set out in Table 1 and consisted of the assessment of the four candidate doctor groups against eleven criteria. The desirable features and the associated rationale are also presented for each criterion in Table 1.

Table 1: Criteria for choosing reference category of doctor

Criterion	Desirable feature	Rationale
• Number of doctors	• Should be significant.	• Modelling of career earnings profile will be more reliable. • Extrapolations to other groups will be from a significant base.
• Mix of services	• Should be relatively homogenous in terms of complexity and intensity of service.	• Translation of the E_p derived for the reference category will be more accurate if the service mix is homogeneous. • Adjustments for intensity are made within the PRS and therefore do not need to be considered in the RRS.
• Sources of revenue	• High proportion of revenue should come from Medicare benefits payments.	• As the RRS is concerned with Medicare earnings, a category of doctors which derive their income mainly from Medicare will allow for more accurate modelling of earnings. • HIC data will be more valuable in the modelling process if it represents the major proportion of earnings.
• Data availability	• Earnings data for the reference group should be easily available. • Multiple data sources are preferred.	• More data will result in a better understanding of the earnings patterns for the reference group, therefore allowing more informed choice of other (non-medical) professional groups for comparison and study of earnings.
• Career characteristics	• Doctors within the reference group should experience similar: - training programs (length, required investment, intensity etc); - requirement for continuing training/education; - career span; - length of peak earnings periods; - proportion of doctors engaged in full time private practice; - retirement patterns; and - impact of work on lifestyle.	• Consistency in terms of these career experiences within the reference group will enable easier identification of other professional groups for comparison. • Homogeneity in these factors within the reference group will improve the validity of using the group as the basis for factor adjustment to determine the E_p for other medical groups.

Table 1: Criteria for choosing reference category of doctor (continued)

Criterion	Desirable feature	Rationale
• Representativeness of the medical profession	• The reference category should be the most acceptable to the medical profession as being representative of all doctors for the purposes of building earnings models. • The relationship between the reference category and other groups of doctors in terms of human capital factors impacting on earnings should be easier to define than for other categories.	• Acceptance of the reference category by the profession is crucial to the (face) validity of the RRS. • Easier to translate from E_p for the reference category to E_p for other categories of doctor.
• Comparability with public sector doctors	• Remuneration arrangements for the reference category should be the easiest to compare with earnings of doctors working in the public sector.	• The earnings of doctors practising in the public sector represent an important source of information; the validity of comparing these data to the earnings patterns of doctors in the reference group should be maximised.
• Comparability with other professional groups	• Working arrangements for the reference category of doctors should enable better comparison of their earnings with those of other professional groups.	• The earnings of other (non-medical) professional groups represent a key source of information; the validity of comparing these data to the earnings patterns of doctors in the reference group should be maximised.
• Comparability with overseas doctors	• The reference group should be comparable with a similar group of doctors overseas.	• Consistency of categorisation will make the comparisons of Australian doctor earnings with overseas doctor earnings more meaningful.
• Fit with PRS	• The reference category of doctor should fit well with the design of the PRS.	• Combination of PRS relative values with RRS derived E_p values ultimately determines the remuneration outcome.
• Fit with PCS	• The reference category of doctor should be the same as, be wholly contained within, or wholly contain the categories used for the same doctors in the PCS.	• The final formula relies of profession specific components from both the RRS and PCS and these need to be consistently defined.

2.2 EVALUATION OF CANDIDATE GROUPS

As illustrated by the methodology, the essence of the evaluation was to ensure that the doctors within the reference group were as homogeneous as possible in terms of service mix and career characteristics. Information on the four groups of doctors against each of the eleven evaluation criteria was collected and, based on a review of this information, an evaluation score was allocated to each of the potential reference groups against each criterion. Scores out of ten were allocated, with high scores indicating a better fit with the desirable characteristics for that criterion. The evaluation for the two key criteria is summarised below.

2.2.1 Number of doctors

The remuneration rate for the reference group needed to apply to a large number of doctors, as it was to form the basis for the remuneration rates for the other categories of doctor. Logically, the basis would be improved if the reference group consisted of a significant proportion of the medical profession. Data on the numbers of doctors for each of the four categories of doctor under consideration, as taken from the Medicare database, are presented in Table 2. Full time equivalents (FTE) are defined by the Medicare Estimates and Statistics Section of the Department as doctors who bill in excess of a threshold level. The threshold level was different for each specialty.

Table 2: Numbers of doctors (headcount and FTE) in candidate reference groups

Group characteristic	GPs	Urban GPs	Consultant Physicians	Urban General Physicians
Number of doctors (headcount)	18,440	13,981	3,494	765
Number of doctors (FTEs)	13,825	10,473	2,125	355

Source: Commonwealth Department of Health and Aged Care, Medicare Data, 1997/98

GPs were the largest group in terms of raw numbers and FTEs. The FTE data are difficult to interpret as only the level of MBS benefits drawn was used to estimate the proportion of time that a doctor chooses to work. Whilst this approach is likely to produce a reasonable estimate of FTEs for GPs, it is known that the great majority of doctors in the physician groups also spend a significant proportion of their time working as Visiting Medical Officers (VMOs) in the public sector. Accordingly, the FTE data based on MBS revenue for physicians did not represent the full FTE picture. It is reproduced for only for information.

Based on the numbers of doctors in the candidate reference categories, the all GPs group was highest ranked on this criterion (evaluation score nine), marginally ahead of the urban GPs group (evaluation score eight), followed by consultant physicians (evaluation score six) and urban general physicians (evaluation score four).

2.2.2 Mix of services

A narrower mix of services by doctors in the reference category would produce a more reliable result when calculating the remuneration reference rate. For doctors who provide a wide range of services, the greater variation in the intensity of service (which is more likely as the number of services increases), the greater the variation underlying the estimate of the F. For this reason a narrow service mix was preferred.

Data on the numbers of services provided by each of the four categories of doctor under consideration, as taken from the Medicare database, are presented in Table 3. The table shows that the most homogeneous group in terms of the narrowest range of services provided is urban GPs. Only ten MBS item numbers accounted for 95% of all services provided by urban GPs and seventeen items accounted for 95% of MBS benefits paid for services provided by urban GPs. The all GPs group was only marginally less homogenous than the urban GP group with twelve items accounting for 95% of MBS services provided and twenty-two items accounting for 95% of MBS benefits paid for services provided to "all GPs".

By examining the higher percentiles, it was clear that the distribution of the number of items required to account for MBS services (or benefits) provided by the "all GPs" group and the "urban GPs" group is very similar. Up until the 97th percentile only two additional item numbers were required to account for all services provided by the "all GP" group relative to the urban GP group (the same as at the 95th percentile). By contrast the two "consultant physician" groups were significantly more heterogeneous than the two GP groups. The "urban general" physicians group was more homogenous than the "consultant physician" group (narrower range of service provided).

Table 3: Numbers of MBS items used by doctors in candidate reference groups

Group characteristic	All GPs	Urban GPs	Consultant Physicians	Urban General Physicians
Number of items which generated:				
20% of MBS services	1	1	1	1
40% of MBS services	1	1	1	1
60% of MBS services	1	1	2	1
80% of MBS services	2	2	12	4
90% of MBS services	5	4	37	17
95% of MBS services	12	10	77	41
96% of MBS services	14	12	95	51
97% of MBS services	18	16	120	65
98% of MBS services	27	23	158	85
99% of MBS services	49	43	232	123
100% of MBS services	1597	1432	1232	608
Number of items which generated:				
20% of MBS benefits	1	1	1	1
40% of MBS benefits	1	1	2	1
60% of MBS benefits	1	1	4	2
80% of MBS benefits	2	2	14	2
90% of MBS benefits	8	6	34	11
95% of MBS benefits	22	17	75	35
96% of MBS benefits	29	23	93	49
97% of MBS benefits	38	32	117	60
98% of MBS benefits	55	46	154	81
99% of MBS benefits	92	79	226	120
100% of MBS benefits	1597	1432	1232	608

Source: Commonwealth Department of Health and Aged Care, Medicare Data, 1997/98

To obtain further insight into the difference in homogeneity, the actual item numbers used for the "all GPs" and "urban GPs" groups were examined. The top twenty-two item numbers accounted for 97.5% of services provided by the "all GPs" group and 97.9% of services provided by the "urban GP" group (marginal difference). Twenty-one of the top twenty-two item numbers were common to both groups with the top twenty being identical (although there is some minor variation in their order). Nine of the top ten item numbers were for consultations for both the "urban GPs" and the "all GPs" groups (the other was for pregnancy tests). The first procedural item number occurred at number eleven for the "all GPs" group and number twelve for the "urban GPs" group and related to performance of an electro-cardio graph. The first surgical item number occurred at number fourteen for the "all GPs" group and number fifteen for the "urban GPs" group and related to the removal of a small skin lesion.

In terms of MBS benefits paid, the top twenty-two item numbers accounted for 95% of benefits paid to the "all GPs" group and 95.8% of benefits paid to the "urban GPs" group (again a marginal difference). Twenty-one of the top twenty two item numbers that accounted for benefits paid were common to both groups (as with services provided, there is some minor variation in the order). The top ten item numbers were for consultations for the "urban GPs" group and nine of the top ten were consultation item numbers for the "all GPs" group. The first procedural item number occurred at number eight for the "all GPs" group (appeared at number eleven for the "urban GPs" group) and related to the removal of a small skin lesion.

Based on these data, the "urban GPs" group was the most homogeneous in terms of services provided (evaluation score nine), marginally ahead of the "all GPs" group (evaluation score eight) followed by "urban general physicians" (evaluation score six) and "consultant physicians" (evaluation score five).

2.3 CHOICE OF REFERENCE GROUP

Table 4 summarises the scores for each group against each evaluation criterion. By adding up the scores (without any weighting), it was possible to obtain a deterministic recommendation for the reference group. Without weighting, the "all GPs" group emerged as the preferred choice for the reference category of doctor. It obtained the highest aggregate score (eighty-five) ahead of the score for the "urban GPs" group (score of seventy-eight). Both the GP groups ranked well ahead of the physician groups (scores of sixty-two and fifty-seven respectively). Accordingly, the analysis clearly demonstrated that, given the design of the RRS (and to a lesser extent the RVS), a GP group was the best choice for the reference category of doctor.

Table 4: Summary of evaluation scores for each group

Criterion	Evaluation Score			
	All GPs	**Urban GPs**	**Consultant Physicians**	**Urban General Physicians**
Number of doctors	9	8	6	4
Mix of services	8	9	5	6
Sources of revenue	8	9	6	6
Data availability	8	6	4	3
Career characteristics	7	8	7	7
Representativeness of the medical profession	9	8	6	5
Comparability with public sector doctors	6	5	8	8
Comparability with other professional groups	7	6	5	4
Comparability with overseas doctors	7	5	5	4
Fit with PRS	8	7	5	5
Fit with PCS	8	7	5	5
Totals	**85**	**78**	**62**	**57**

Given the relative similarity of the evaluation scores, the final choice between the "all GPs" and the "urban GPs" group depended on the weighting given to the criteria. It was clear that while all the criteria were relevant (and therefore important), they did not have equal weight. In particular those criteria that related to the homogeneity of services provided, the homogeneity of career characteristics, and the availability of comparative data would attract higher weights. A weighted evaluation score was therefore likely to lead to a closing of the gap in the evaluation scores between the "all GPs" group and "urban GPs" group.

Following consideration by the Board, weighting the criteria did not prove to be necessary. Closer examination of the scores of the individual criteria showed that the "all GPs" group had the highest score on seven of the eleven criteria. In terms of homogeneity of service mix, the analysis showed that although "urban GPs" was the highest ranked group, the difference between the "urban GPs" and "all GPs" group was marginal. A similar conclusion was reached in respect of the homogeneity of career characteristics. On this basis the "all GPs" group was chosen as the reference category of doctor without pursuing the process of weighting of the criteria.

3

Determining the remuneration reference rate

Term of reference (b) for the RRS required HMA to:

> **"establish an annual and hourly remuneration reference rate for the selected category of doctor, specified in relation to the particular category of work undertaken for that category of doctor, as dollar amounts"**

3.1 METHODOLOGY

The methodology for term of reference (b) was based around the development, in parallel, of remuneration data in three major areas.

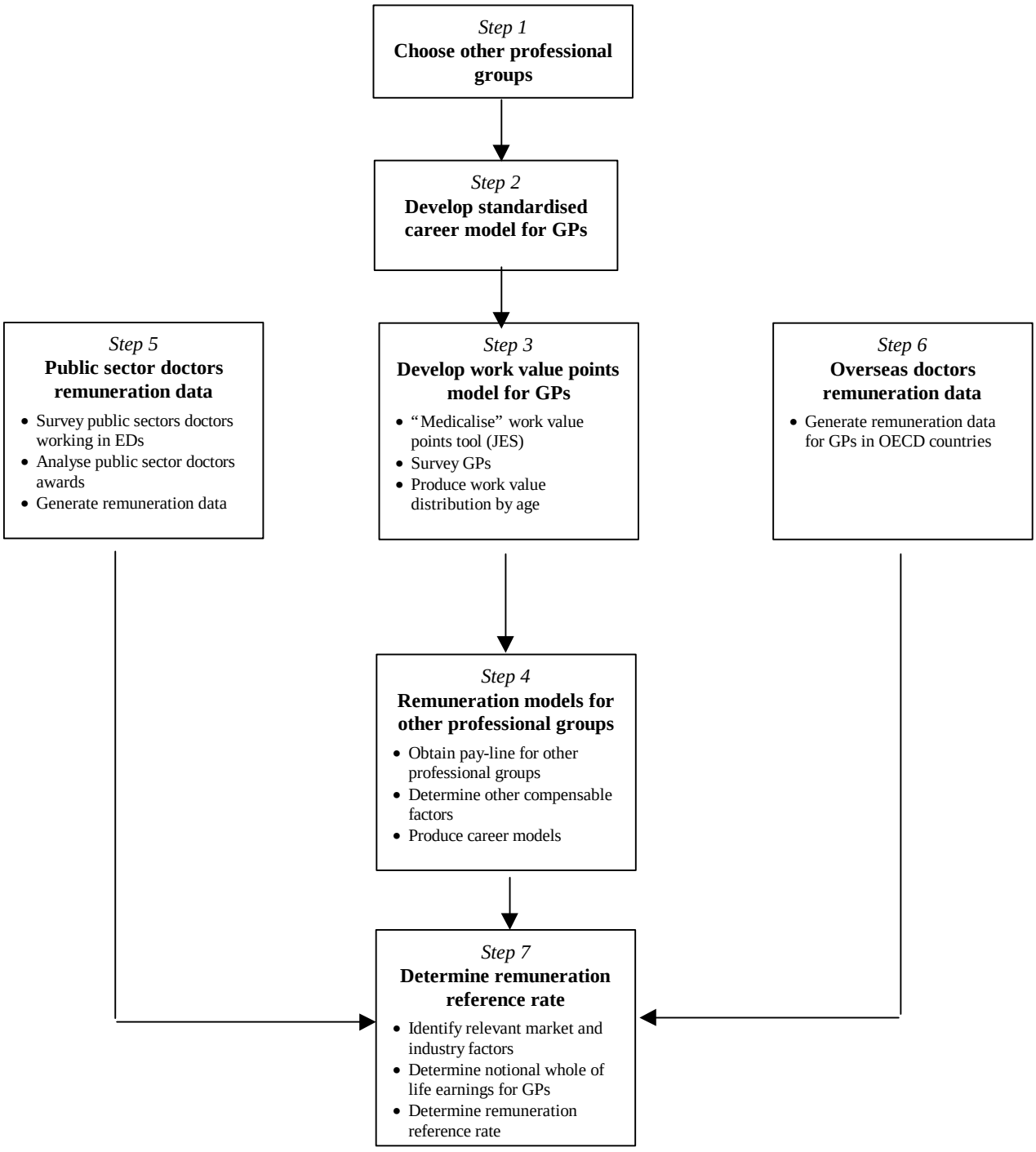
The first, and most important, area was the development of standardised career models for other (non-medical) professional groups. These models estimated the whole of life earnings a range other professional groups (eg accountants) on the basis of following the same career path and undertaking work of similar value to GPs. Building these standardised career models therefore required a measure of the similarity of work between GPs and other professionals. The measure used is known as work value points. The work value points were used to ensure that the practitioners in the other professional groups to be used in the remuneration comparisons were doing similar work to GPs.

Measuring the work value points for GPs became a major component of the RRS. The method used was the Job Evaluation System (JES), which is commonly used by the remuneration sub-consultants Mercer Cullen Egan Dell (MCED) to advise on salaries for professionals in Australian industry. More information on the JES is included in section 3.4.1 of this report. MCED made available to the RRS a database containing information on work value points and remuneration levels for a range of professionals in Australian industry. In order to use this database a survey of sixty GPs was conducted to determine the distribution of work value points across the GPs' career. The work value points were used to link the remuneration levels for the other professional groups to equivalent GP work by using "pay-lines". The choice of pay-line (median, 75th percentile and so on) may be influenced by consideration of a range of other compensable factors that are not taken account of in the allocation of work value points.

The second area for investigation generated reference data on the remuneration of doctors in the public sector. A direct survey of doctors working in Emergency Departments in public hospitals was conducted to generate the data. A series of industrial Awards (Commonwealth and State) for doctors working in the public sector were also examined to gain insight into interpreting the survey data.

The third area generated reference data on the remuneration of overseas doctors (GPs or their equivalents) by examining a range of published datasets, largely from OECD countries. The methodology for calculating the remuneration reference rate for GPs is illustrated in Figure 1.

Figure 1: Methodology for term of reference (b)



The process of moving from deriving the three datasets (standardised career models, public sector doctors, and overseas doctors) through to the determination of the remuneration reference rate for GPs was complex. Of necessity, the process mixed quantitative analysis with qualitative judgements to determine a fair and reasonable remuneration reference rate for GPs.

The detailed career earnings models had to be interpreted in conjunction with the higher level (broader) remuneration data for public sector and overseas doctors in producing the remuneration reference rate. This process involved consideration of a range of industry and market factors that compared GPs with the other professional groups. It also involved a weighing up of the impact data on average annual earnings (public sector doctors and overseas doctors) should have on the remuneration reference rate relative to the impact of the whole of career earnings models for the other professional groups.

The balance of this chapter summarises the findings in respect of each of the seven steps identified in the methodology (see Figure 1).

3.2 CHOOSING THE OTHER PROFESSIONAL GROUPS

The first step of the work on term of reference (b) was to select the other (non-medical) professional groups for which standardised career models were to be developed. These professional groups were carefully chosen using clear criteria that searched for similarity between the intellectual capital factors of practitioners in those groups with intellectual capital factors for GPs, whilst having regard to practical factors such as the availability of remuneration data.

Broadly, the selection method consisted of two phases. The first phase used a number of simple criteria to reduce the potential number of professional groups to be studied from in excess of two hundred (drawn from the Australian Standard Classification on Occupations (ASCO)) to a list of fourteen for further consideration. The second phase reduced the list of fourteen professional groups by considering the availability of data on remuneration for practitioners in each group.

3.2.1 First level assessment

The ASCO classification system comprises major occupation groups ranging from Managers & Administrators to Labourers and related workers. ASCO Major Group 2 – "Professionals" was used as a starting point for the selection process in the RRS. The use of ASCO Major Group 1 – "Managers and Administrators", was considered but the majority of categories in this part of the classification represented the line managers of the professionals that were defined in Major Group 2. As Major Group 1 added very few new categories, it was excluded from the selection process.

Each Major Group had four levels of sub-groups within its bounds. The groups became increasingly detailed. The Unit level was the third level of detail. As an example, the following tree shows the categorisation for GPs in the ASCO system.

2. Professionals (Major Level)
23. Health Professionals (sub-group 1)
231. Medical Practitioners (sub-group 2)
2311 Generalist Medical Practitioners (sub-group 3)
2311-11 General Medical Practitioner (sub-group 4)
2311-12 Medical Practitioner in Training (sub-group 4)

All professional occupations at the Unit level (sub-group 3) of the ASCO structure were considered. The Unit level was chosen due to the availability of Labour Force survey data from the Australian Bureau of Statistics (ABS). The only data gathered at the next level of classification (Occupation - six digit) was in the five-yearly ABS population census.

At the Unit level, ASCO Unit level consisted of 79 categories of professionals. Two were excluded as they related to medical practitioners, thereby leaving 77 categories for detailed evaluation. The following selection criteria were tested for use as the first step in the selection of other professional groups.

(1) Exclude groups where the number of practitioners was relatively small.

(2) Exclude groups where a significant number of practitioners derived income from methods other than remuneration for professional time input (eg margins on product sales or margins on the sale of the professional time of employees).

(3) Exclude groups that did not have a formal continuing education program.

(4) Exclude groups where there was not an active professional body that represented a significant proportion of practitioners in the group.

(5) Exclude groups where practitioners in the group required a TER score below a minimum level to gain access to study for professional qualifications (ie less than 65).

In order to apply these criteria, a professional organisation for each of the Unit level classifications was identified. These organisations were contacted to find if their members earned significant income through means other than remuneration for professional time and if they had a continuing professional education program. Data on numbers of practitioners were obtained from the most recent ABS Labour Force survey. Data on TER scores were obtained from the most recent edition of the "Good Universities Guide" and from a number of State-based Tertiary Admissions Centres.

After eliminating all the groups that did not meet the first and second criteria, and making a series of adjustments to consolidate various groups (eg group auditors with accountants), there were fourteen groups that met all three remaining requirements. The fourteen groups as shown in Table 5 formed the working list for choosing the other professional groups. The remaining major consideration was the availability of remuneration data on each of the short-listed other professional groups.

Table 5: Candidate groups for second level evaluation

Profession	Evidence of a Formal Continuing Education Program	Presence of a Representative Professional Body	Require a Tertiary Entrance Score above 65
Chemists	✓	✓	✓
Geologists and Geophysicists	✓	✓	✓
Architects and Landscape Architects	✓	✓	✓
Engineers	✓	✓	✓
Accountants	✓	✓	✓
Mathematicians, Statisticians and Actuaries	✓	✓	✓
Dental Practitioners	✓	✓	✓
Occupational Therapists	✓	✓	✓
Physiotherapists	✓	✓	✓
Speech Pathologists	✓	✓	✓
Podiatrists	✓	✓	✓
Medical Imaging Professionals	✓	✓	✓
Veterinarians	✓	✓	✓
Legal Professionals	✓	✓	✓

3.2.2 Second level assessment

Due to the decision to use work value points to ensure that the subset of practitioners in the other professional groups were doing similar work to GPs, the second level assessment focused on the availability of remuneration data against work value points.

The remuneration sub-consultants to the project, MCED, advised that data linking income to work value points were available for five of the shortlisted groups as set out below:

- Engineers;
- Lawyers;
- Accountants;
- Chemists; and
- Geologists.

Accordingly, these five professions were chosen as the other professional groups for developing the standardised career models.

3.3 DEVELOPING STANDARDISED CAREER MODEL FOR GPs

The second step of the work on term of reference (b) was the development of a standardised career model for GPs. This model was the basis for calculating the whole of life earnings for GPs using market rates of pay for the other (non-medical) professional groups and was required to address both terms of reference (b) and (d). As part of the work on term of reference (d), career models were formulated for twenty categories of doctor (including GPs). The process for developing the career models is reported in more detail in Chapter Four.

The career models were designed to specifically take account of a range of intellectual capital factors including:

- the pre-fellowship, fellowship and post fellowship training periods;
- typical hours required for continuing medical education (CME);
- standardised practice hours (40 hours per week);
- standardised career entry and exit ages; and
- typical earnings through the training period.

The model represented the career progression of 100 doctors who eventually end up in independent practice as general practitioners. These doctors are assumed to embark on undergraduate medical studies in the year they turn eighteen and move continuously through the various career phases until they retire from general practice. The model has a number of standardising assumptions that prevent it from being compared directly to the actual distribution of any particular group of 100 doctors who end up as practising GPs. Simple assumptions, for example, that all doctors are 18 years old in their first undergraduate year have the effect of standardisation, which is necessary, but in practice there are many individuals for whom this assumption is not true. Remuneration rates derived through a standardised model, however, do not disadvantage those doctors whose career path follows a different course.

The career model was formulated by defining six major phases over the course of a full medical career as follows:

- Undergraduate education;
- Pre-fellowship;
- Fellowship training;
- Post-fellowship;
- Independent practice; and
- Retirement.

The principal information sources for preparing the model were the results of a survey of RGRR members (the "human capital factor survey"); data obtained from the Royal Australian College of General Practitioners (RACGP) and University Medical Schools; and an extensive analysis of the Medicare database (cross sectional data from 1998/99 and longitudinal data from 1994/95 to 1998/99). Various other information sources were pursued in the course of developing the model including a number of follow-up discussions with RGRR members and the RACGP.

By combining the standardising assumptions with the data obtained on the intellectual capital factors (as defined above), the career model for GPs was produced as illustrated in Table 6.

Table 6: Extract from standardised career model for GPs

Career Stages	Age															
	18-22	23	24	25	26	27	28	29	30	31	32	33	34	35-59	60-64	65+
Undergraduate Education	100	95	35	7												
Pre-Fellowship Training		5	64	78	54	29	9	2								
Fellowship Training			1	15	46	70	77	55	32	11	3					
Post Fellowship Training							7	19	21	18	10	4	1			
Independent Practice						1	7	24	47	71	87	96	99	100	90	
Retirement															10	100
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

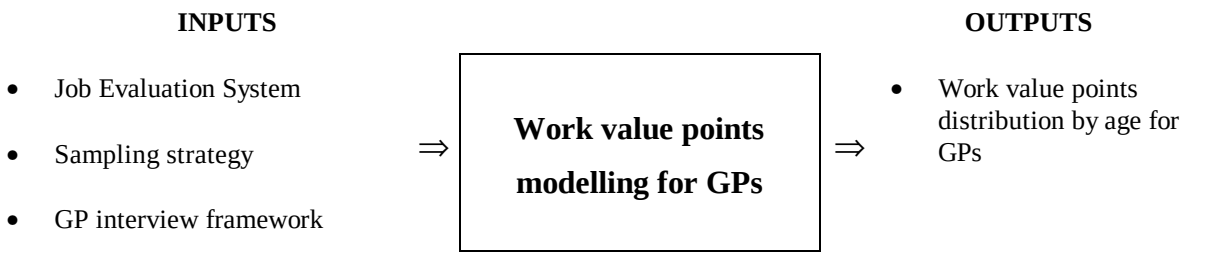
The model illustrates the effect of standardisation. In the model, all doctors started undergraduate education at age eighteen and retired at age sixty-five. The first doctors graduated (from undergraduate training) at age twenty-three (five-year medical degrees) and moved into fellowship training (FRACGP) at age twenty-four. Under the standardising assumptions the first GPs reach independent practice at age twenty-seven and all GPs have reached independent practice by age thirty-five.

3.4 DEVELOPING THE WORK VALUE POINTS MODEL FOR GPs

The third step of the work on term of reference (b) became known as the GPWVPS. After much research and consideration it was determined that the work value points approach was the best available method for ensuring that the remuneration levels for other professional groups used to determine the remuneration reference rate were the most comparable to GPs. In essence, the work value points approach was used to identify that subset of practitioners in the other professions doing similar work to GPs. Only this subset of remuneration levels was used in the standardised career models.

In order to generate the data necessary to build the career models, and to complement the data available for the other professional groups, the distribution of work value points by age applicable to GP roles needed to be estimated. Figure 2 illustrates the key inputs in finding the work value points distribution by age for GPs.

Figure 2: Finding the work value points distribution for GPs



3.4.1 The Job Evaluation System

In order to identify the subset of practitioners in other professional groups that was doing similar work to GPs a measure of similarity was required. It was clear that the nature of work varied within the other professional groups, and also differed between those groups and GPs. For example, it is intuitively reasonable to expect that a barrister involved in a complicated criminal trial would be working harder than a lawyer doing routine property conveyancing transactions. Such a difference is present even though the work involved may take the same amount of time to complete. This example illustrates the concept of intensity of work.

Following a detailed investigation it was determined that the best measure of similarity could be derived from the job evaluation systems used by remuneration consulting firms when they are engaged to recommend remuneration packages for specific positions (a core activity for such firms). MCED, the remuneration sub-consultants to the RRS, use a technique known as the Job Evaluation System (JES) for this purpose. JES, and a number of similar systems in the remuneration consulting industry, assign "work value points" based on an assessment of the primary factors relating to each job, not the job's occupant. This is a very important JES principle; it is the work value of the job that is being evaluated, not the performance of the person doing the job. The resultant work value points can be used as a surrogate measure of intensity of work.

The work value points score assigned to each job reflects the "value" of the work being done. The process involves the preparation of a detailed job description (if it does not already exist) for the position under evaluation. Work value points for the position are then determined by the assessment of the job description against three primary factors of "expertise", "judgement" and "accountability". The JES produces work value scores for professional positions in the range from 250 to 1,000 points. The 250 point level reflects an entry level graduate position and 1,000 points applies to a professional position requiring an international "guru" in the professional discipline. Scores for all but the top 12% of positions occupied by professionals range between 250 and 730 points.

Although the JES had been widely used in the health system, it had not been widely used for doctors doing clinical work. Accordingly, it was decided to pilot test the JES for use in relation to GP work by evaluating five GP jobs. It was also decided to closely involve GPs in the process by creating the GPMRG to work with the project consultants to address the JES refinement issues. There were two outcomes of the pilot testing process. The first outcome was a series of adjustments to "medicalise" the JES and make it more applicable to general practice work. The second was the identification of a number of compensable factors relating to GPs that should be considered within the RRS and that could not be fully taken account of within the JES. These factors, which became known as the "super-added" factors, were worked on concurrently with the GP interviews (see below).

This conclusion did not mean the JES should not be used to determine the work value points distribution for GPs. On the contrary, the JES proved to be suitable for a very important and substantial part of the job, that is narrowing the comparative base for the other professional groups and providing an indication of any change in the nature of work across a GP's career. No other practicable method was identified to achieve these objectives.

3.4.2 The sampling strategy

To give effect to the JES, a sample of GPs had to be selected that represented the age profiles of all GPs. Each of these sampled GPs was subject to a 60-90 minute interview by a job analyst from MCED to enable the preparation of a detailed job description for evaluation. The sampling strategy was determined, within a limitation of sixty sample points to balance location (state and rurality), age and gender. Sixty GPs were drawn from six age cohorts (twelve GPs from four age cohorts and six from the other two) to meet certain criteria including:

(1) Only GPs in age cohorts 25-29 (6 GPs), 30-34 (12 GPs), 35-39 (12 GPs), 45-49 (12 GPs), 55-59 (12 GPs) and 60-64 (6 GPs) were selected.

(2) Only GPs who have a level of Medicare income consistent with active practice were included in the sample population (generate >$100,000 per annum in schedule fees).

(3) A stratified sample using gender and practice location (Rural, Remote and Metropolitan Areas (RRMA) categories) was drawn for each age cohort (equal number of data points in each stratum).

(4) Only GPs practising in NSW and Queensland were selected (this criterion was used only to simplify the logistics associated with the survey as there appears to be no reason why GPs work value should be different across States).

Using these assumptions a sample of GPs was selected in each age cohort at random. A back-up list, also at random, was selected for each cohort in case the originally sampled GP was not available to, or chose not to, participate in the survey. As indicated above, not all age groups could be directly sampled within the sixty-point limit. The final distribution of the sixty sample points is shown in Table 7:

Table 7: Sampling schema within each strata cell

RRMA category	Number of sample points for each age cohort								
	25-29 years			30-34, 35-39, 45-49, and 55-59 years			60-64 years		
	M	F	Tot	M	F	Tot	M	F	T
Categories 1 & 2 combined	2	2	4	3	3	6	1	1	2
Category 3 only	1	1	2	1	1	2	1	1	2
Categories 4 & 5 combined				1	1	2	1	1	2
Categories 6 & 7 combined				1	1	2			
Total	3	3	6	6	6	12	3	3	6

The sampling process provided the data to allow a curve-fitting approach to be used to determine the distribution of work value points by age. The curve-fitting approach also generated a statistically sound estimate of the work value points for the age groups that were not directly sampled. It is important to note that the stratified approach meant that not all sample points counted equally towards the estimate. Each point counted in the proportion that GPs with its characteristics were present in the GP population as a whole. For example, the sampling ratio of males to females was 50%, but the actual ratio of males to females in the work value points estimate was adjusted to be the same as for the GP population.

3.4.3 The interview framework

A formal interview framework was developed by working with the GPMRG. This framework was faxed to GPs in advance of their interview with the job analyst for the purpose of preparing a job description. Following the interview, GPs were given the opportunity to review a draft job description and to modify it as necessary by working with the job analyst. The interview framework generated the information required to prepare and subsequently evaluate the job description. Only minor changes between the draft job description prepared by the job analyst and the job description approved by the interviewed GP resulted from the review process.

3.4.3 The work value points distribution by age

It was important to find the distribution of work value points by age as this provided information as to how the work of a GP changed across his/her career. Because it was known that work value points varied considerably across the career of other professionals, it was reasonable to expect that there would be similar variation for doctors. For the sixty sampled GPs the GPWVPS-specific JES assigned work value points to the work they carry out. The statistical sub-consultants to the RRS, AdStat Solutions from the University of Adelaide completed an analysis of the survey data.

Table 8 presents the mean and 95% confidence intervals by age cohort derived from the quadratic curve fitted to the sixty sample data points.

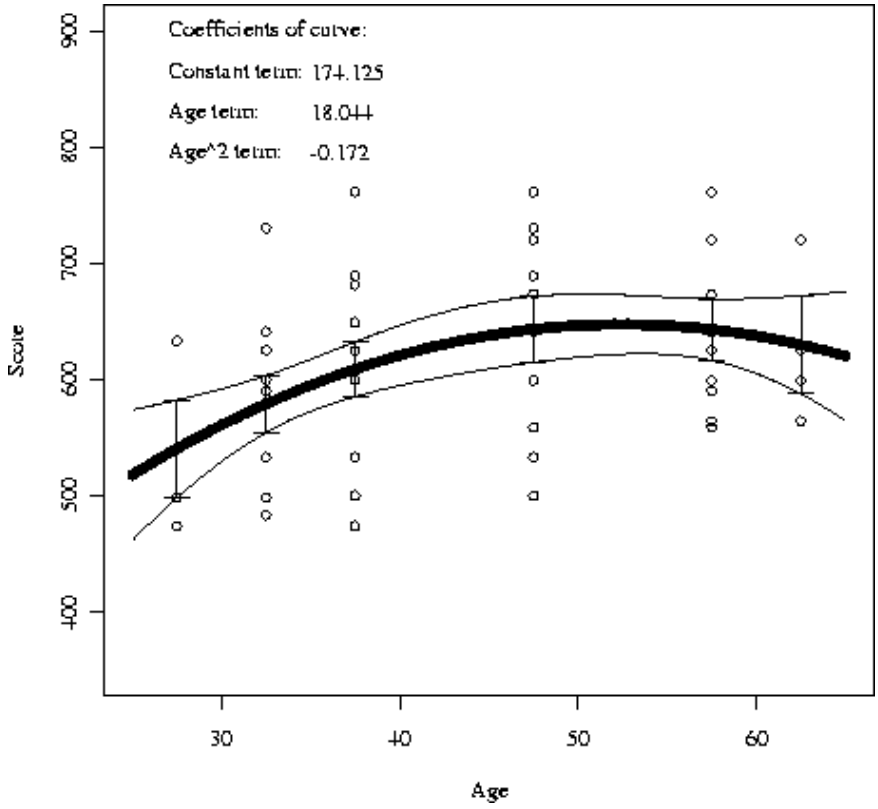
Table 8: Population-weighted estimates of work value points by age cohort: all GPs

Age cohort	Mean	95% confidence interval	
		Lower bound	Upper bound
25-29 years	540.2	498.2	582.3
30-34 years	578.8	554.3	603.4
35-39 years	608.8	585.2	632.4
40-44 years	630.2	602.5	658.0
45-49 years	643.0	614.6	671.4
50-54 years	647.2	621.7	672.7
55-59 years	642.8	616.3	669.3
60-64 years	629.8	587.6	672.1
Total	629.7	609.0	650.4

The estimate of the mean reflects the value of the curve at the mid-point in each age cohort, in other words the estimated average work value points for the age cohort. The confidence interval measures the range for which there is a 95% probability that the population mean will be within the predicted interval. Use of the fitted curve also allowed estimates to be made of the mean and standard deviation for GPs in the two age cohorts not sampled (40-44 and 50-54) weighted according to the entire Australian GP population. Using these data the mean work value points of the Australian GP population was 629.7.

Figure 3 presents the quadratic curve (from which the data in Table 8 are derived) fitted to the work value data points and displays the envelope within which it was possible to be 95% confident that the actual curve would lie.

Figure 3: Work value points fitted to curve: all GPs

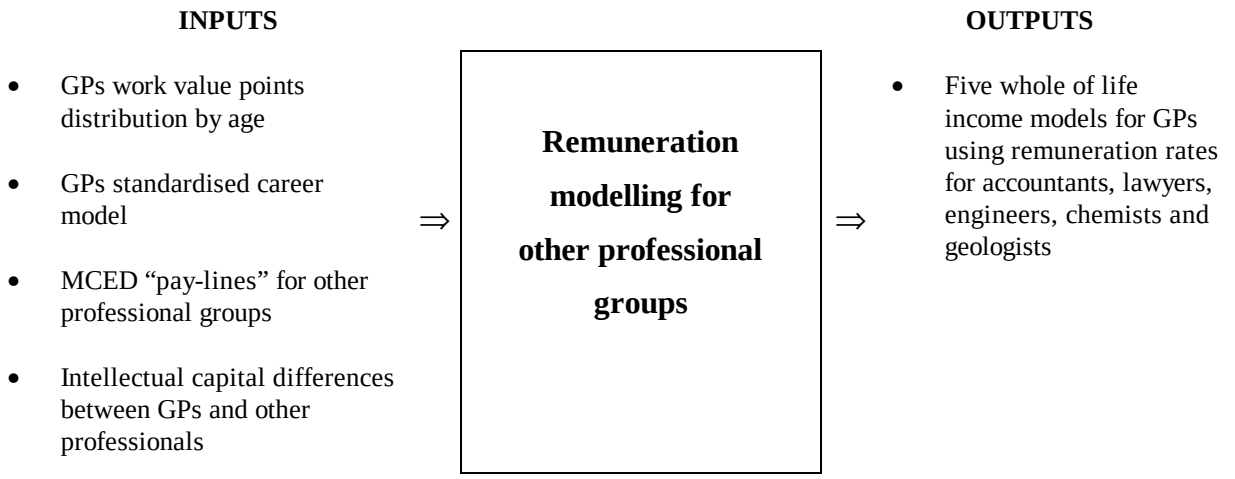


Review of the data showed that the GPWVPS has demonstrated that there was variability in the value of GP work as measured by the JES. This variability was in a narrower range than for other professionals but it was still higher than anticipated. There were 10,760 GPs in the in-scope GP population (excluding those aged 65 plus), thus the sample of 60 represented only 0.56% of the population. Given the relatively small sampling fraction, the 95% confidence interval for the mean, was a little wider than desirable (around fifty points for the age cohorts where twelve sample points and around eighty-five points for those age cohorts with six sample points, and around 40 points for the overall mean). Nevertheless, the data provided reasonably reliable estimates of the mean work value points in each age cohort.

3.5 REMUNERATION MODELS FOR OTHER PROFESSIONAL GROUPS

The fourth step in the work on term of reference (b) was to develop five career earnings models for the other five professional groups (accountants, lawyers, engineers, chemists and geologists). As already indicated a key assumption underlying the RRS was that the remuneration data to be used for comparison purposes in determining a fair and reasonable income for GPs was derived from outside the current Medicare system. The key source of comparative data was the remuneration levels of other professional groups, which had similar intellectual capital requirements (in terms of formal qualifications) and career characteristics to GPs. The career models were developed for each group using the GP career path with the earnings levels applicable to practitioners in each group doing work of similar value to GPs. Figure 4 illustrates the key inputs to, and outputs from, the process of developing the standardised career models.

Figure 4: Remuneration modelling for the other professional groups



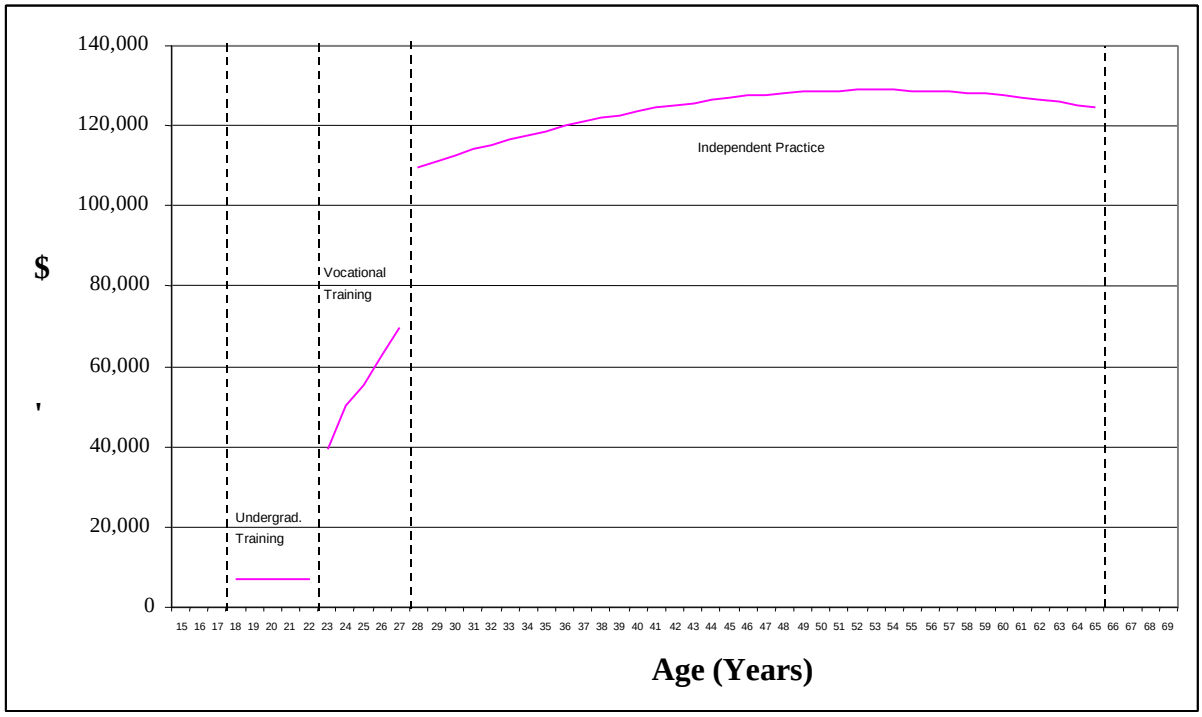
Although the five other professional groups (accountants, lawyers, engineers, chemists and geologists) were selected on the basis of having comparable intellectual capital characteristics to doctors (and also with regard to the availability of remuneration data), none of these groups was a perfect comparison group for GPs. In fact, the work on the RRS revealed that there were no perfect comparator groups. Also, by working with the GPMRG, a number of intellectual capital factors that might not directly (or adequately) have been taken into account by the JES were identified. Examples of these factors included differential lengths and cost of training, different commitments required to continuing education and so on.

The presence of these factors meant that the work value points attributed to a job could not alone determine the "right" remuneration for that job. For every work value points number for a given profession there are a range of remuneration levels in the market place. Given the work value points distribution for GPs it was still necessary to decide at which remuneration level (eg 50^{th} percentile, 75^{th} percentile and so on) to link a GP with the same work value points number as a practitioner in another professional group. This process proved to be extremely complex and in the end did not reach a final conclusion. There were different views within the Board as to whether and how to take account of the impact of potentially compensable factors (the "super-added" factors) that may not have been completely accounted for by the JES in choosing the appropriate pay-line. Nevertheless, this report describes the full process using illustrative examples.

3.5.1 Building the standardised career models

Figure 5 illustrates the standardised career earnings model for GPs highlighting the three distinct career phases (Phase A: undergraduate training, Phase B: vocational training, and Phase C: professional practice). **Note the income levels shown are only for illustrative purposes.** Figure 5 highlights the standardising assumptions that were applied so that all models are based on individuals starting their career when they turn eighteen (18) and completing their career (retiring) when they turn sixty-five (65). Figure 5 is simpler (for illustrative purposes) than the actual model that was used in the analysis as it indicates that all doctors make the transition from one career stage to another (ie A to B or B to C) in the one year. The actual model allows for this transition to take place over a number of years, based on what happens in practice, as was illustrated in Table 6.

Figure 5: Standardised career earnings model for GPs



In producing this model for the five comparator groups, the fact that individuals pursuing a career in each of the professions spent different lengths of time in each career stage relative to GPs needed to be taken into account. Assumptions were needed to derive the appropriate income level for the other professional groups for each GP career phase. To illustrate the approach taken, each career phase is considered in turn using accountants as an example.

- ***GPs in Undergraduate Training***

When GPs are in undergraduate training, accountants could be in any one of three career phases as set out below.

Accountants in undergraduate training

For the years where GPs are in undergraduate training and accountants are in undergraduate training, the income figure for accountants is the standardised $7,000 per annum for the career earnings model (derived from the youth allowance, assumed to be net of direct education costs). For the standardised career model for accountants this assumption applies to ages eighteen, nineteen and twenty.

Accountants in vocational training

For the years where GPs are in undergraduate training and accountants are in vocational training, a representative earnings figure had to be chosen for use in the career model. As GPs are not working it was not possible to use work value points to link to remuneration levels for accountants through "pay-lines" to derive a representative income for accounts doing work that is similar to GP work. It could be argued that the representative earnings level for accountants should continue to be $7,000 per annum. This assumption is not appropriate as it ignores the income foregone by GPs in pursuing a medical degree. The income that

accountants earn while they are in vocational training (and GPs are in undergraduate education) effectively represents an opportunity cost for GPs.

Accordingly, the income figure used was an estimate of the salaries of accountants at the ages when they are in vocational training. The actual earnings figure used in the model was the representative annual salary less direct education expenses (vocational training fees and HECS repayments) at the same age. For the accountants' career model, this situation occurs at ages twenty-one and twenty-two.

Accountants in independent practice

The situation where GPs are in undergraduate training and accountants are in professional practice is analogous to when the accountants are in vocational training. Accordingly, the income figure used in this situation was an estimate of the salaries of accountants at the ages when they are in the early years of professional practice. As above, the actual earnings figure used in the model for accountants was the representative annual salary less any continuing education expenses (professional society memberships, any remaining Higher Education Contribution Scheme repayments) at the same age. For the accountants' career model this situation occurs (in part) at ages twenty-three, twenty-four and twenty-five.

Summary

The income levels that apply at each age in the career model where there is at least one GP in the undergraduate training phase are shown in Table 9 for all the comparator professions. Representative incomes have been taken largely from the Graduate Careers Council of Australia's Graduate destination survey published in December 1999. The career model for GPs (see Table 6) shows that there are some GPs in undergraduate education for ages eighteen through to twenty-five.

Table 9: Income by year when GPs are in undergraduate education

Age	GPs	Accountants	Engineers	Lawyers	Chemists	Geologists
18 years	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000
19 years	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000
20 years	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000
21 years	$7,000	$29,000	$7,000	$7,000	$33,000	$33,000
22 years	$7,000	$31,000	$35,000	$30,000	$35,000	$35,000
23 years	$7,000	$34,000	$37,000	$33,000	$37,000	$37,000
24 years	$7,000	$38,000	$40,000	$37,000	$40,000	$40,000
25 years	$7,000	$43,000	$43,000	$42,000	$43,000	$43,000

Source: Based on the Graduate Careers Council of Australia's Graduate destination survey, December 1999

It is important to appreciate that for those years where not all GPs are in the same career stage (in this case undergraduate education) the actual income used in the career model is the weighted average for all the stages where there is at least one GP.

- ***GPs in vocational training***

For the years where GPs are in vocational training, all accountants are in professional practice. In this situation the GPs have commenced work (albeit not in independent practice) as have all the accountants. Four options for choosing the representative earnings to be used in the career model for these years were considered, as follows:

(1) Estimate of accountants' income at same age. This option disregards the fact that the value of the work that GPs are doing may be different to the work that accountants are doing even though their age is the same.

(2) Estimate of GPs' income at the same career stage. This approach recognises that the income the GPs are actually paid when they are working as interns and registrars is likely to be a reasonable estimate of what an accountant would be paid if he/she were doing similar work to GPs at the same age.

(3) Estimate of work value points for GPs in vocational training used to estimate earnings for accountants doing work of same value. The basis of estimation would be the work value points curve produced for the independent practice years for GPs.

(4) Measurement of the work value points for GPs in vocational training used to estimate income for accountants performing work of same value. This option is identical to that being used in the independent practice phase. It would have involved the evaluation of GPs' jobs in the intern, registrar and post-fellowship training periods of the GPs' career.

Option (4) was the most consistent with the work value points approach. It would have required the application of the JES to interns, GP registrars and GPs in post-fellowship training. This work was outside the scope of the GPWVPS and option (4) was therefore not pursued. Option (1) was eliminated because it ignored the fact that GPs are likely to be doing work of different value to accountants.

Option (3) relies on the assumption that the continuous curve describing the relationship between work value points and age for GPs in the independent practice years (see Figure 4) can be used to estimate the same relationship in the pre-independent practice years. There was no evidence base for this is assumption. In fact, the limited information available (without direct measurement) and reasonable intuition suggested that there is a stepped jump in work value points when GPs obtain their Fellowship. The use of a continuous curve to estimate work value points would have been inappropriate in these circumstances.

Accordingly, option (2) was used as the best estimate of the applicable earnings in the accountants' career model for the period where accountants are in professional practice and GPs are in vocational training. For accountants, this situation occurs (in part) for ages twenty-three through to thirty-four. Table 10 presents the income figures used for the years when GPs are in vocational training.

Table 10: Income by year when GPs are in vocational training

Age	Pre-Fellowship Training				Fellowship Training				Post-Fellowship Training	
	year 1	year 2	year 3	year 4	year 1	year 2	year 3	year 3R	year 1	year 2
23 years	$39,500									
24 years	$39,500	$44,000			$50,500					
25 years	$39,500	$44,000	$48,000		$50,500	$55,500				
26 years	$39,500	$44,000	$48,000	$55,000	$50,500	$55,500	$63,000			
27 years		$44,000	$48,000	$55,000	$50,500	$55,500	$63,000	$63,000	$70,000	
28 years			$48,000	$55,000	$50,500	$55,500	$63,000	$63,000	$70,000	$70,000
29 years				$55,000	$50,500	$55,500	$63,000	$63,000	$70,000	$70,000
30 years					$50,500	$55,500	$63,000	$63,000	$70,000	$70,000
31 years						$55,500	$63,000	$63,000	$70,000	$70,000
32 years							$63,000	$63,000	$70,000	$70,000
33 years									$70,000	$70,000
34 years										$70,000

Table 10 highlights that, in the vocational training phase of the career (phase B), the income used in the model depends only on point of progression that the GP has reached, rather than his/her actual age. Naturally it is not possible for GPs to reach certain stages before a particular age (eg no GP is in post-Fellowship training until age 27 years and so on). The data shown in Table 10 were used in the career models for all the comparator professional groups. They were also used in the standardised career model for GPs.

- ***GPs in independent practice***

When GPs are in independent practice, all accountants are in professional practice. For these years, work value points were used to determine the representative earnings for an accountant carrying out work similar to GP work at the same age. The GPWVPS was constructed specifically to measure the relationship between work value points and age for GPs. Table 11 (taken from Table 8 earlier in this report) illustrates the work value points distribution by age, by providing the values at the mid-point of each age cohort.

Table 11: Work value points distribution by age for GPs

	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Average points	540	579	609	630	643	647	643	630

3.5.2 The MCED pay-lines

The MCED "pay-lines" model the relationship between work value points and remuneration for other professional groups. The lines were derived from market data obtained by MCED. For a given percentile the line represents the best fit (least squares regression) between the work value points and remuneration. The variation is caused by factors such as industry within which the job is located, supply, demand, location of job and so on. Five pay-lines were produced, one for each of the other professional groups under study. For accountants, lawyers, engineers, and chemists/geologists, the "pay- lines" show the 25th, 50th and 75th percentile remuneration levels for a given value of work value points. For chemists and

geologists individually (ie not the combined group) only the median "pay-lines" are shown due to the limited spread in the distribution of the available MCED data points.

In using the pay-lines, the data source from which they were derived needs to be carefully considered. MCED has the largest database on the remuneration of professionals in Australia. Nevertheless, the database was drawn largely from MCED clients, which are not statistically representative of the total Australian labour market. Specifically, MCED advised that the pay-lines provided were likely to overestimate the true market medians for the professional categories because:

- the MCED database is skewed towards organisations that have a higher capacity to pay;
- industry sectors that tend to pay lower are underrepresented in the MCED database;
- the MCED database largely contains jobs that are based in Sydney and Melbourne, where the rates of pay tend to be higher.

It was not possible to estimate the extent of over-estimation, as general market data that measure the relationship between JES work value points and remuneration were not available. Thus, the issues of data bias (overestimation of the true market median remuneration) need to be considered when using the pay-lines.

3.5.3 The super-added factors

Using the "pay-lines", judgements could be made about the most appropriate level to choose when comparing GPs to each of the professional groups in turn. It was considered likely that a different choice would be appropriate for each professional group (for example, the 50th percentile may be appropriate for lawyers but the 75th percentile may be more appropriate for geologists). The key consideration in choosing the pay-lines was the impact of the super-added factors (ie those compensable factors that may not have been adequately taken account of by the JES work value points).

By working with the GPMRG and conducting independent investigations, seven potentially compensable factors that may not have been adequately accounted for within the JES framework were identified. These factors were investigated in some depth with the result that there was agreement within the Board on how some factors should be used in the career models but disagreement on others. Each of these factors is defined below and its status at the time of concluding work on the RRS is reported.

- ***Length of Training***

This factor refers to the differential undergraduate and vocational training undertaken between GPs and the comparator professions. The standardised career model for GPs estimated the median age of entry into independent practice for GPs at around thirty years. Estimates for the comparator professions showed accountants entering independent practice at twenty-three years and lawyers at twenty-four years. This difference in training time (undergraduate and vocational) was not completely accounted for through the JES although the "knowledge and experience" sub-factor had regard to the level of qualifications required to carry out a specific job. However, it was agreed that these differences were directly accounted for in the standardised the career models by including the earnings of the other professionals while GPs are still in undergraduate training in the standardised career models. The results of the career models therefore included the impact of differential lengths of training.

- ***Costs of training***

This factor refers to the additional direct costs incurred by GPs as part of their undergraduate education and fellowship training relative to the comparator professions. The research supporting the development of the standardised career models demonstrated that there were differences in the costs expended by GPs on their undergraduate and postgraduate training relative to the comparator professions. As with length of training, the JES made no direct (or even indirect) adjustment for differential costs of training, so it was appropriate to consider the issue outside the JES framework. However, it was agreed that the differences were directly accounted for in the standardised career models. The results of the career models therefore included the impact of differential costs of education.

- ***Continuing education***

This factor refers to the additional requirement for continuing education (CE) for GPs relative to the comparator professions. It was suggested that GPs had a different requirement (in terms of time input) for CE than the comparator professions. The JES did not directly take account of the CE requirements of professional groups (it focused on evaluating the job). Accordingly, it was agreed to consider adjusting the standardised career models directly for any differences in continuing education.

Analysis of CE in the comparator professions showed that the minimum time for those practitioners who participated in the relevant CE programs was accountants (thirty-five hours per year); lawyers (no widespread programs); engineers (fifty hours per year); chemists (thirty hours per year) and geologists (fifty hours per year). The minimum time for GPs was estimated at forty-five hours per year, with the typical time (as advised by the RACGP) being 120 hours per year. It was therefore possible to conclude that for those practitioners who participated in CE programs there was not much difference in the minimum CE time requirement with GPs falling into the same range as the other professional groups. For these reasons, no direct quantitative adjustment for difference in CE time was made to the standardised career models.

However, the GP program was compulsory (assuming the GP wished to maintain Vocational Registration status) and the participation rate was known to be very high. Investigations showed that the participation rates for the other professional groups were low, with the exception of accountants where CE was required for accountants wishing to sign-off on audited reports of public companies. It could therefore be argued that participation in CE for GPs was higher than all the comparator professions. Accordingly a qualitative adjustment for CE (for example, choosing a higher pay-line for lawyers could reflect the fact that lawyers had little or no participation in CE relative to GPs who had very high participation) was considered. There was no agreement within the Board on whether an adjustment was appropriate.

- ***Human management risk***

This factor refers to the risks associated with the conduct of professional practice. For doctors, human management risk was largely about the risk associated with seeing and correctly diagnosing 30 – 40 patients per day. A number of GPMRG representatives stressed that, although it occurs infrequently, there are significant consequences for doctors associated with misdiagnosing cases where life-threatening conditions are involved. It was argued that these consequences extend well beyond any financial penalties that are insurable through

professional indemnity. It was also argued that these consequences are more serious for GPs than for the comparator professions (and hence the impact of a GPs work is greater).

The JES had an "Impact" sub-factor but it was considered that this factor did not adequately deal with human management risk. Accordingly it was agreed that it was reasonable to consider an adjustment for human management risk outside the outside the JES. There was no specific methodology in use in the remuneration industry to consider such risks, rather they were normally considered on a case by case basis and usually subject to individual judgement. Accordingly, a number of possible methods for quantifying the human management risk factor were considered.

Following detailed consideration, there was no agreement within the Board on a method for quantifying the human management risk factor. Some Board members believed that human management risk could not be quantified while others believed that it was possible to quantify. It was agreed that human management risk was one of the factors that should be considered when choosing the appropriate pay-line for each of the other professional groups. The consideration of how human management risk should influence the choice of pay-line was a disagreed matter.

- ***Nature of GP work***

The nature of GP work factor evolved from the merger of the breadth of work and the undifferentiated nature of GP work factors initially identified by the GPMRG. The breadth of work factor was about the amount of knowledge, skill and experience required to carry out an individual task in professional practice. It did not refer to the number of different types of tasks carried out in professional practice over time by an individual. This latter area is the basis of the score for the "breadth" sub-factor (part of the overall "expertise" factor) in the JES. It was suggested that GPs drew on more knowledge and skills in one clinical consultation than other professional practitioners may in their typical tasks.

The undifferentiated work factor was about GPs not being able to predict the types of problems or issues they will be required to deal with on a daily basis or being able to take steps to limit the types of problems or issues presented. The nature of GP work is that there is limited control or prior knowledge of the types of problems or needs that patients present to the GP on any day. It was argued that a GP could see 30 – 40 different patients in one day and each could present with completely different needs and problems. This element of undifferentiation was considered to add complexity to the work of a GP. Accordingly, it was suggested that GPs work was more undifferentiated than the comparator professions.

After some consideration, the Board agreed that these two factors were different ways of expressing the same concept. If work is undifferentiated, then it follows that the work has wide breadth. The combined factor was referred to as nature of GP work. The JES contained some element of the nature of GP work factor in the "Expertise – Knowledge and Experience" sub-factor where positions were assessed against proficiency in applying the learnings of the discipline and the "Judgement – Reasoning" sub-factor where the impact of diverse influencing factors on problem solving was recognised. It was, however, agreed that the two JES sub-factors did not sufficiently capture the complexity of this issue in relation to GP work and an adjustment outside the JES should be considered.

As with human management risk, a number of methods for quantifying the impact of the nature of GP work factor were discussed. However, no agreed measure could be identified as there were differing views amongst Board members about the merit of various approaches. It was agreed that some consideration of the nature of GP work outside the JES was warranted. The method for that consideration was a disagreed matter amongst Board members.

- ***Return of investment in intellectual capital***

This factor is concerned with the need for an individual to obtain a return for an investment; in this case the investment was the building up of intellectual capital by undertaking the training needed to practice in a profession. It was different from the direct dollar costs of extended training and the reduction in years available for earning income that were dealt with by specific factors. This factor referred only to the difference in the investment in intellectual capital during the course of undergraduate and vocational training between GPs and the comparator professions.

The job focus of the JES meant that it was not designed to deal with return on investment in intellectual capital issues. Individuals confront this issue when they make choices as to career directions. As part of making such choices, they will presumably consider career prospects (including remuneration) associated with obtaining qualifications in a particular profession. Such remuneration considerations are likely to be based on what the market is offering to pay for professionals in the various disciplines being evaluated.

It seemed appropriate that the fair and reasonable hourly rate for GPs should generate an internal rate of return that was commensurate with the other professional groups under study. This principle was accepted by the Board, and a number of approaches for measuring the return on investment in intellectual capital were suggested by various stakeholders in the RRS. As no agreement could be reached on the most appropriate method to use, the return on investment in intellectual capital factor was classified with continuing education, human management risk, and nature of GP work as a disagreed matter.

- ***Intellectual capital on entry into undergraduate education***

This factor relates to the intellectual capital on entry to the required undergraduate degree for the chosen profession. A proxy measure for the difference in intellectual capital was the Tertiary Entrance Ranking (TER) score. Entry into Medicine required a higher TER than entry into any of the comparator professions. In addition, the TER was different between the comparator professions. While it was possible to quantify the TER differences amongst the professional groups under consideration, the question remained as to the appropriateness of considering TER to be a compensable factor.

Whatever the merits of the TER score as a compensable factor, it was not directly accounted for in the allocation of work value points by the JES (the JES evaluates the job). Review of the data confirmed that medicine required a higher TER score to gain entry into the necessary undergraduate education than the comparator professions. Using TER and a range of other criteria, medicine was rated as tougher to get into than the courses required for all the comparator professions. Nevertheless, the Board agreed that intellectual capital on entry into undergraduate education (proxy TER score) should not be a directly compensable factor in the context of the RRS. It was agreed that the emphasis of the RRS should be on ensuring that the fair and reasonable remuneration rate for GPs should reflect an adequate return on investment in intellectual capital to be a doctor (undergraduate and vocational training).

- ***Summary***

Table 12 highlights the Board's final position on the super-added factors. It shows that the Board reached agreement on how three of the seven factors should be treated, but not the other four.

Table 12: Status of super-added factors influencing the choice of pay-lines

Factor	Position
1 Length of training	Included in career models, agreed by Board
2 Cost of training	Included in career models, agreed by Board
3 Continuing education	Compensable, accounting method disagreed
4 Human management risk	Compensable, accounting method disagreed
5 Nature of GP work	Compensable, accounting method disagreed
6 Return on investment in intellectual capital	Compensable, accounting method disagreed
7 Intellectual capital on entry to undergraduate education	Not compensable, agreed by Board

Assuming the median as a reasonable benchmark, it was possible to summarise that the super-added factors - continuing education, human management risk and nature of GP work - suggested a choice of pay-line above the median. The fact that the MCED database overestimated the true market median suggested a choice of pay-line below the market median. Due to the disagreement on methods within the Board, there was insufficient work done to determine whether the return on investment in intellectual capital factor suggested a choice of pay-line above or below the median.

3.5.4 Completing the standardised career models

Given that the Board could not agree on methods for dealing with the super-added factors, it was not possible to complete the development of the standardised career models. **For the purposes of illustrating the methodology the median pay-line for each of the comparator professions has been used.** By making this choice, a value for the remuneration reference rate that produced the same whole of life income for GPs as the standardised career model for each comparator profession could be found. To illustrate this process, the estimated average work value points for a GP aged 25-29 was 540. For the accountants' model, a representative remuneration for 540 point accounting jobs, taken from the median "pay-line", was $102,463. For a GP aged 30-34 years, the estimated average work value points is 579. Again for the accountants model the median remuneration for 570 point accountants was $107,171. Similarly, for all of the other age cohorts the representative remuneration level can be calculated. The remuneration data produced from this process are presented in Table 13.

Table 13: Career model for accountants standardised for GPs work value points by age

	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Average income	$102,463	$108,583	$113,291	$116,587	$118,627	$119,255	$118,627	$116,587

Note: For illustrative purposes, these data are based on the use of median pay-lines

In practice, the career model used the GP actual age in years rather than using the mid-point of a five-year range. That is for the 30-34 year age cohort, ages thirty, thirty-one, thirty-two, thirty-three, and thirty-four were modelled individually rather than being assigned the modelled value for the mid-point of the range. The NPV of this career model can be interpreted as the present value of the career earnings of accountants who follow the GP career path, do work of similar value to GPs, and are paid according to market rates for accountants. This same process was used for all the other professional groups to produce the NPV for their career earnings that was comparable to GPs. Table 14 presents these results for each comparator group. The full mathematical representation of the remuneration rate calculation model is contained in Appendix C.

Table 14: Remuneration reference rate generated by the comparator professions(1)

Comparator Profession	Career NPV	GP hourly equivalent(2)	GP annual equivalent(2)
Accountants	$1,355,437	$67.30	$123,826
Lawyers	$1,441,930	$72.42	$133,262
Engineers	$1,364,197	$67.82	$124,782
Chemists	$1,217,915	$59.15	$108,828
Geologists	$1,157,354	$55.55	$102,217
Chemists/Geologists	$1,169,806	$56.29	$103,576

(1) For illustrative purposes, the comparative data are based on the use of median pay-lines
(2) GP equivalent remuneration is based on Medicare income earned from personal exertion by working the standardised 1840 hour year, excluding profits or losses from other activities (e.g. engaging locums)

Table 14 shows that the career models produced data in a fairly wide range, moving from an annual rate of $102,217 (geologists) to $133,262 (lawyers). The differences in remuneration for positions with similar work value points across the professional groups effectively estimated the differences in the labour markets for the other professions. In hourly rate terms, this range represented $55.55 using the geologists' model through to $72.42 per hour using the lawyers' model. **These figures are illustrative only.** They do not include any adjustment for the super-added factors or for data bias.

The impact of a different choice in "pay-lines" is illustrated in Table 15. It presents the equivalent values of E_{gp} if other than the median "pay-lines" were used. Note that the 37.5^{th} percentile value is estimated by interpolation from the 25^{th} and 50^{th} percentile values and the 62.5^{th} percentile value is estimated by interpolation from the 50^{th} and 75^{th} percentile values.

Table 15: E_{gp} variations with choice of "pay-line"

Comparator Profession	Pay-line percentile				
	25th	37.5th	50th	62.5th	75th
Accountants	$54.60	$60.95	$67.30	$74.58	$81.86
Lawyers	$68.40	$70.41	$72.42	$81.26	$90.11
Engineers	$61.13	$64.48	$67.82	$72.20	$80.59
Chemists			$59.15		
Geologists			$55.55		
Chemists/Geologists	$46.97	$51.63	$56.29	$59.69	$63.09

Review of Table 15 highlights there was quite a significant range even within a particular comparator profession's model. For example, moving from the 25th percentile to the 75th percentile for accountants moved the equivalent E_{gp} from $54.60 to $81.60. This result was consistent with expectations, as remuneration levels in the market are known to be in a wide range. There are four principal predictors of pay for any particular job; work value, merit, performance and markets. The methodology controlled for variation in the work value points, while (of necessity) leaving the variation due to other factors. This analysis highlights the importance of the choice of pay-line in determining E_{gp}.

3.6 PUBLIC SECTOR DOCTORS REMUNERATION DATA

An important part of the agreed methodology was the inclusion of "public sector doctors" as one of the other professional groups. The Board decided to focus this part of the work on producing broad annual income comparisons for doctors working in the public sector doing work that could be compared to GP work. Doctors working in public hospital Emergency Departments providing care to undifferentiated patients without direct supervision were chosen as the best comparison group. A survey targeted at this group of doctors was designed and distributed with the cooperation and support of the Australasian College of Emergency Medicine (ACEM). Some seventy-six survey returns (about 20% response rate) were received and processed and seventy were used in the analyses. The data received were found to be of reasonable quality and internally consistent.

The overall results of the survey showed that the income for the target group of public sector doctors was in a fairly narrow range. The representative figure (mean or median) for doctors working fulltime in public hospital Emergency Departments was $149,000. For doctors with FACEM qualifications the average was higher at around $158,000, whereas for doctors with FRACGP qualifications only, the average was much lower at around $88,000. There were only four doctors with FRACGP qualifications who responded to the survey, so it was not possible to draw any conclusions about this group.

To allow more meaningful comparisons of the emergency physicians data with fair and reasonable remuneration levels for GPs, two subsets of the survey population were created. The first (subgroup one) was focused on capturing full-time doctors who spent at least 50% of their time on patient care. The nature of Emergency Department work (as borne out by the survey) is that many doctors in the target group will also spend significant amounts of their

time supervising the work of interns, residents and registrars. For this reason, subgroup two was formed by taking all those doctors above the patient care time threshold of 50% and further removing doctors undertaking a high proportion of administrative work by excluding Departmental Directors and Deputy Directors from the analysis (subgroup two). Table 16 presents the results for each survey group.

Table 16: Average and percentile annual incomes for public sector doctors(1)

Income measure	All Respondents	Subgroup 1	Subgroup 2
Average income	$148,578	$149,786	$142,578
25th percentile	$131,289	$140,072	$135,246
50th percentile	$149,117	$152,053	$149,397
75th percentile	$170,341	$167,022	$159,940

(1) Mainly Emergency Physicians holding FACEM qualifications working in public hospital EDs

Review of Table 16 shows that there was very little difference in the median income for the three groups. It was reasonable to conclude that a consistent estimate of the remuneration range for Emergency Department doctors working full-time in public hospitals with FACEM or other specialist Fellowship qualifications was from around $135,000 to $160,000 (25th percentile to 75th percentile). The remuneration range for subgroup one, which included Departmental Directors and Deputy Directors was, as expected, somewhat higher being from around $140,000 to $167,000. Given the nature of GP work, the more relevant comparator reference point is the $135,000 to $160,000 remuneration range.

Naturally, these figures could not be directly compared to remuneration levels for GPs. Although adjustments were made for factors such as salary packaging, provision of fringe benefits and leave loading, the nature of the survey process is such that it was impossible to ask sufficiently detailed questions to allow an understanding and quantification all of the remuneration differences. A variety of factors to be considered in using the $135,000 to $160,000 remuneration range for emergency physicians, as part of the process of determining the remuneration reference rate for GPs, are set out below.

3.6.1 Differences between Emergency Physicians and GPs work

It was clear that the work of GPs and Emergency Physicians was not identical. While it could be argued that for Emergency Department patients in triage categories 4 (semi-urgent) and 5 (non-urgent) there are considerable similarities to GP's patients (and therefore work), the same argument would probably not apply to patients in triage categories 1 (resuscitation) and 2 (emergency). Patients in triage category 3 (urgent) are more difficult to classify in this way with the argument being that some of these could be similar to GP's patients while others would not be similar. Table 17 sets out data on the distribution of emergency patients by triage categories taken from a 1996/97 survey of twenty-eight Australian hospitals carried out by Coopers & Lybrand for the (then) South Australian Health Commission and the (then) Commonwealth Department of Health and Family Services.

Table 17: Distribution of Emergency Department Patients by Triage Category, 1996/97

Triage Category	Hospital Type				
	Teaching	Specialist	Other Metropolitan	Large Country	All Hospitals
1 Resuscitation	1.5%	0.6%	0.7%	0.3%	1.0%
2 Emergency	11.5%	5.6%	2.8%	2.9%	7.5%
3 Urgent	30.2%	36.5%	20.6%	12.4%	24.8%
4 Semi-urgent	52.3%	41.4%	35.1%	45.0%	47.3%
5 Non-Urgent	4.5%	15.9%	40.7%	39.3%	19.5%

Source: South Australian Health Commission and Commonwealth Department of Health and Family Services 1998, Outpatient Costing and Classification Study, by Coopers and Lybrand

The data demonstrates the types of patients that presented to Emergency Departments. It highlights the fact that GPs would not typically see a significant proportion of patients presenting to Emergency Departments as categories 1, 2 and at least some of 3. Equally, it shows that GP patients would comprise of Emergency Department categories 4, 5 and some of 3. On this basis it can be argued that there is some overlap between the patients of emergency physicians and GPs. It is, however clear that relative to GPs, emergency physicians deal with a much more complicated group of patients with life threatening conditions in a very different setting for which they are specifically trained.

3.6.2 Intellectual capital differences between emergency physicians and GPs

Intellectual capital differences between GPs and Emergency Physicians stem largely from the different lengths and costs of the respective training programs and different requirements for CME. Much of the difference arose from the fact that emergency physicians typically underwent a five-year fellowship training program compared to a three-year fellowship training program for GPs. The index numbers model (see Chapter Four) measured the intellectual capital difference between GPs and emergency physicians for doctors working in independent practice (effectively the private sector) so the results were not directly applicable to the public sector (different experiences in terms of type of work and associated costs). The area where there was the least applicability of the index numbers model results is CME time required. Public sector doctors typically carried out a range of CME activities in normal (standard) time, whereas these activities resulted in a reduction in the available patient care time in independent practice (thereby reducing income).

3.6.3 Difference in standard working hours and conditions

The standardised career models used in the RRS assumed forty hours of patient care work per week for forty-six weeks each year for doctors in private sector. Other activities such as administration, practice development, and CME were assumed to take place outside the standardised forty hours. In the public sector, the survey showed that Emergency Physicians also worked around forty hours (excluding overtime) in a normal week. This time, however, typically included activities such as administration and CME.

Within salaried time emergency physicians typically had access to five weeks annual leave, at least ten days sick leave and three months long service leave for every ten (this figure varied across States) years service. The majority of salaried emergency physicians also reported

access to conference, study and sabbatical leave. The survey did not provide sufficient information to determine the take-up rates for such leave (eg although long service leave is generally available, many doctors do not receive it because they change employers before they qualify). In contrast, the standardised career model provided for four weeks annual leave. Any other leave (sick leave, long service leave, study leave, conference leave or sabbatical leave) represented a reduction in the time available for patient care, thereby reducing income.

3.6.4 Market factors

Remuneration for public sector doctors working in Emergency Departments is set on a much smaller market than private practice income (which is determined by Medicare rebates and individual doctors charging policies). Accordingly the remuneration levels for emergency physicians will have factored in the need to attract these doctors to work unsociable hours, perhaps in non-preferred locations and so on. Private sector doctors can determine their practice location to a much larger extent.

Aside from the differences in working hours and conditions, there are sometimes other benefits in working in the public sector. For example emergency physicians working in teaching hospitals may have access to academic appointments with their associated Universities. Such appointments may not carry any additional salary, but may nevertheless be valued by many doctors.

3.6.5 Employed versus self-employed

A number of the differences highlighted above stemmed from the fact that the survey (deliberately) targeted salaried doctors working in the public sector. The comparative group was GPs working in the private sector, many of whom were self-employed, effectively running (usually) small professional services businesses. As such private GPs carry business risks, whereas salaried emergency physicians carry little (if any) business risks. These risks relate to developing a viable practice, employing staff, and providing medical services to a high standard. This issue is highlighted because it is relevant to the use of the survey results, but it is also highlighted that dealing with issues related to the self-employed nature of most private practitioners was outside the scope of the RRS.

3.6.6 Summary

The public sector doctors survey was not intended to be definitive. The key conclusion of the survey was that the income range of $135,000 to $160,000 ($25^{th}$ to 75^{th} percentile) represented a reliable estimate of the remuneration applicable to public sector doctors working in hospital Emergency Departments who had attained Fellowship qualifications. A range of factors, for which the impact could not be reliably quantified within the scope of the survey need to be taken into account when using these figures as reference points in setting the fair and reasonable remuneration reference rate for GPs.

3.7 OVERSEAS DOCTORS REMUNERATION DATA

Consistent with the methodology for term of reference (b), information on the earnings of overseas doctors was the other the data source to be considered as input into setting the remuneration reference rate for GPs. Data on earnings of doctors overseas were collected for the purposes of comparison with the earnings of equivalent doctors in Australia. As GPs were

the reference group for the RRS, the focus of the comparisons was on overseas doctors carrying out a similar role to that carried out by GPs in Australia.

Various methods in searching for overseas income data were used. Large volumes of data were considered but there were very serious limitations on the use and presentation of the data because the associated definitions and timeframes were not consistent and comparable across countries. The analysis focused only on those countries where data on doctors that were similar to GPs in Australia could be obtained. The best source of international data that we could identify was the OECD Health Data 99 publication. Census data were also reviewed, but were found to be of little value. The best source of Australian data was the average drawings on MBS by GPs (which do not give the full remuneration picture).

Using the data obtained, some useful comparisons between Australia and other countries were produced. In all the analyses the United States led the way with the highest income for General (Family) Practitioners. This ranking was in spite of the US not requiring a gatekeeper role of their GPs (US patients do not need to see a GP before they visit a specialist). Australia ranked third in GP income behind USA and UK when comparing on the Purchasing Power Parity (PPP) scale. PPP converts individual currencies to a measure that allows the purchasing power of each currency to be retained while still allowing comparisons across countries. The PPP is set in such a way that a given sum of money will buy the same basket of goods and services in all countries. PPP eliminates the effect of differences in price levels between countries. In terms of average earnings, Australian GPs were shown to earn 2.79 times average earnings. This was the second biggest differential behind USA, where GPs were shown to earn 3.28 times average earnings. Norway had the smallest differential with GPs earning 1.42 times average earnings.

When considering only those countries where GPs have a gatekeeper role, Australian GPs are closely comparable to UK GPs and generally earn more than their counter-parts in other countries using a PPP based comparison. The picture was slightly different when a standard currency is used, but the PPP comparison is the best one to use. Table 18 summarises the results for all countries used in the comparison.

Table 18: GP remuneration comparisons, various countries

Overseas Doctors	Annual earnings ($AUD)	Relative Index Value	Annual earnings (PPP)	Gatekeeper Role?
Australia[1,2,3]	$88,877	2.79	68,367	Yes
Finland[1]	$76,691	1.78	47,078	Yes
France[1]	$83,304	1.57	50,677	No
New Zealand[1,4]	$57,156	2.39	47,316	Yes
Norway[1]	$68,531	1.42	37,835	No
United Kingdom[1,5]	$110,737	2.59	69,505	Yes
United States[1]	$215,538	3.28	139,000	No

(1) OECD Health Data 99, OECD, Paris, 1999
(2) Australian Health Insurance Commission 1998/99
(3) Australian Bureau of Statistics, Employee Earnings and Hours 1998
(4) New Zealand 1996 Census Data
(5) RCGP Information Sheet No 5 April 1999 – Health Service Expenditure

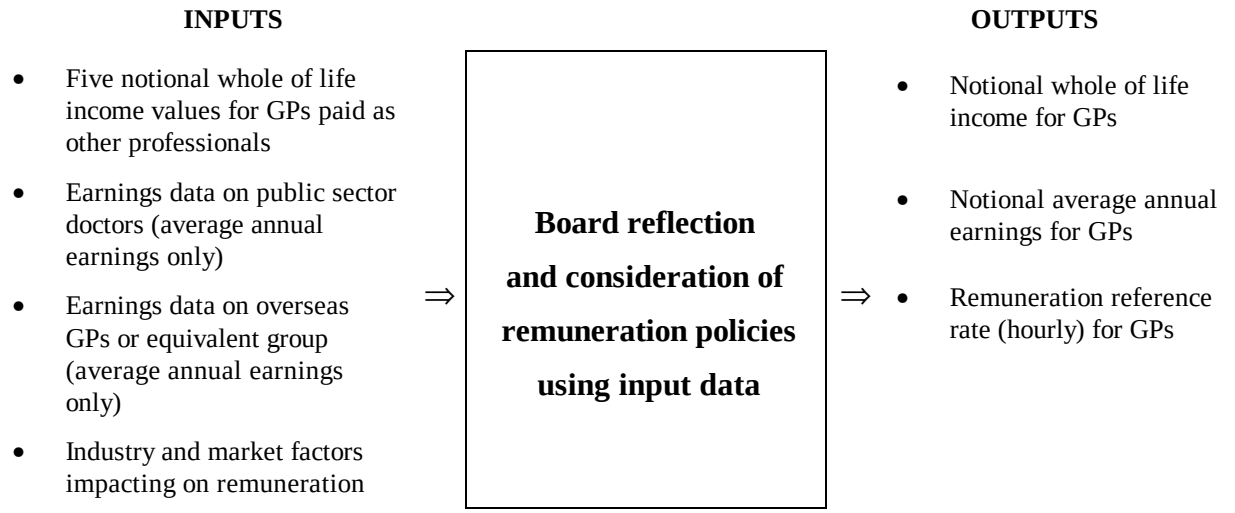
Table 18 shows that, in terms of remuneration, Australian GPs compared well to all other countries considered with the clear exception of the United States where all doctors, including GPs, earned considerably more than their counterparts overseas by any measure. The significant difference in GP earnings between GPs in Australia and the UK when considered in standard currency terms is largely eliminated when PPP based comparisons were used (i.e. the purchasing power of the currency removes most of the difference). It was also interesting to note that the gatekeeper role did not appear to explain remuneration differences, as there were countries where GPs were not gatekeepers where their earnings were more than Australian GPs (USA) and less than Australian GPs (France, Norway).

Overall, in the context of the RRS, the analysis of overseas doctors' remuneration proved to be of limited value. The comparisons between the countries able to be reported upon were of interest. However, the quality, comparability and amount of information available on relative doctors' incomes across countries severely limited the comparative base and hence the utility of the analysis. Equally, it was clear that the results produced are largely as expected (the US being significantly different to other countries). The nature of the findings were such that they could not be expected to have any significant impact on setting the remuneration reference rate for GPs in Australia in the context of the RRS.

3.8 CALCULATING THE REMUNERATION REFERENCE RATE

The final stage in completing the work on term of reference (b) was to determine the notional whole of life income for GPs and convert this value into an hourly remuneration reference rate. The key inputs into this step were the career earnings models, the public sector doctors remuneration data and overseas doctors' remuneration data. Figure 6 illustrates the key inputs to, and outputs from, the process of determining notional whole of life income for GPs and the associated remuneration reference rate.

Figure 6: Determining the remuneration reference rate



The decision on the notional whole of life income for GPs needed to be made from the five values obtained for whole of career earnings by using the market rates for the other professional groups. In taking this decision, the remuneration levels for GPs overseas and for the relevant subset of public sector doctors working in Australia needed to be considered, although these data were not on a whole of career basis. Clearly the decisions made in this step largely reflect the Boards consideration of, and reflection on, a range of industry and market related factors that influence remuneration.

3.8.1 Industry and market factors impacting on remuneration

The standardised career models produced values for whole of life incomes for the comparator professions (standardised for GP work) based on market rates of pay prevailing around December 1999 (the Board's reference date). The purpose of considering industry and market factors impacting on remuneration was to attempt to measure the degree to which the observed remuneration rates (December 1999) may vary from the long-term market average. The JES process did not reflect the impact of industry and market factors (JES only measured work value). It was considered that putting the standardised career model results into the context of the prevailing market conditions at the time the data were extracted (December 1999) would assist in determining how the results of the standardised career models should be used to set the remuneration reference rate.

Accordingly, an analysis of industry and market factors was carried out specific to the comparator professions. The industry and market factors considered were:

- Industry capacity to pay;
- Demand for labour;
- Supply of labour;
- Competition for employment;
- Industry stability;
- Turnover of labour;
- Job security; and
- Availability of a career path.

In many areas the analysis was, by necessity, subjective and relied on a compilation of expert opinion rather than detailed empirical studies. Reliance on opinion was necessary as the type of analysis that was being carried out for the purposes of the RRS had no precedent that could

be drawn upon. Overall, it was found that, in the context of the RRS, some of the industry and market factors were more relevant to setting the remuneration reference rate than others. All the factors considered were typically used (in addition to work value points) by organisations considering where to pitch their remuneration levels for particular jobs, relative to the market. By their nature the industry and market factors are related and therefore not mutually exclusive.

The analysis focused on considering the relationship between the market norm and the NPV of the standardised career model for each comparator group. The nature of the industry and market factors was that some of the factors suggested that the market norm remuneration would be above the outcome of the standardised career model for a given professional group, some indicated an outcome about equivalent, while others suggested a choice below. When taken as a group the impact of the industry and market factors suggested an overall position of the market norm would be below the NPV of the standardised career model for accountants and lawyers, about the same as engineers and above the chemists and geologists. Table 19 brings together the impact of the industry and market factors and the results of the standardised career models (taken from Table 14).

Table 19: Remuneration reference rate generated by the comparator professions(1)

Comparator Profession	Career NPV	GP hourly equivalent(2)	GP annual equivalent(2)	Market norm
Accountants	$1,355,437	$67.30	$123,826	Below
Lawyers	$1,441,930	$72.42	$133,262	Below
Engineers	$1,364,197	$67.82	$124,782	About
Chemists	$1,217,915	$59.15	$108,828	Above
Geologists	$1,157,354	$55.55	$102,217	Above
Chemists/Geologists	$1,169,806	$56.29	$103,576	Above

(1) For illustrative purposes, the comparative data are based on the use of median pay-lines
(2) GP equivalent remuneration is based on Medicare income earned from personal exertion by working the standardised 1840 hour year, excluding profits or losses from other activities (e.g. engaging locums)

The Board was not able to reach agreement on the value of the analysis on the industry and market factors. Accordingly, the method for including this analysis in the determination of the remuneration reference rate became a disagreed matter.

3.8.2 Determining the notional whole of life income for GPs

The industry and market factor analysis left open the question of the relationship between the notional whole of life income for GPs (I_{gp}) and the market norm for the individual career models. A key issue that was to be addressed was should I_{gp} reflect the approximate position of the market norm derived from the results of standardised career model, or should any other factors be used to influence the positioning of I_{gp} relative to the market norm? In reaching a final decision on I_{gp}, the impact of the other two key pieces of information (earnings of public sector doctors and earnings of GPs (or their equivalents) overseas) also needed to be considered. Table 20 consolidates all of the available information to support the determination of the notional whole of life income for GPs.

Table 20: Comparisons to determine notional whole of life earnings of reference group

Remuneration comparisons with Australian Professionals	Career NPV[(1)]	Hourly rate[(2)]	Annual rate[(2)]	Impact on choice of I_{gp}
Accountants	$1,355,437	$67.30	$123,826	?
Lawyers	$1,441,930	$72.42	$133,262	?
Engineers	$1,364,197	$67.82	$124,782	?
Chemists	$1,217,915	$59.15	$108,828	?
Geologists	$1,157,354	$55.55	$102,217	?
Chemists/Geologists	$1,169,806	$56.29	$103,576	?
Public sector doctors	N/A	$81.52	$150,000	?
Remuneration comparisons with Overseas Doctors	**Annual rate ($AUD)**	**Index on average earnings**	**Annual earnings (PPP)**	**Impact on choice of I_{gp}**
Australia	$88,877	2.79	68,367	?
Finland	$76,691	1.78	47,078	?
France	$83,304	1.57	50,677	?
New Zealand	$57,156	2.39	47,316	?
Norway	$68,531	1.42	37,835	?
United Kingdom	$110,737	2.59	69,505	?
United States	$215,538	3.28	139,000	?

(1) For illustrative purposes, the comparative data are based on the use of median pay-lines
(2) GP equivalent remuneration is based on Medicare income earned from personal exertion by working the standardised 1840 hour year, excluding profits or losses from other activities (e.g. engaging locums)

It was not possible to develop a formula that took all these data, compared them across the professions under consideration, and produced a deterministic result. Rather, solving the problem called for a series of difficult judgements about the impact of all the data on the final choice of I_{gp}. The RRS provided a range of supporting information to allow the judgments to be made. The standardised career models, the public sector doctors and overseas doctors remuneration information provided the quantitative information. The analysis of super-added factors, industry and market factors and the advice on the limitations of the source data provided the qualitative information.

3.8.3 Determining the remuneration reference rate for GPs

Once the notional whole of life earnings figure for GPs (I_{gp}) had been determined, the hourly remuneration reference rate (E_{gp}) could be calculated. The mathematics of this process are deterministic, because the average annual earnings required to generate the career NPV could be calculated and that figure then used to derive an hourly rate by using the standardising assumptions (specifically the forty hours per week for forty six weeks per year or 1840 hours in total). For example, working backwards, an hourly rate of $70 per hour would be derived from a notional annual earnings figure of $128,800 ($70 x 1840 = $128,800), which in turn would be derived from a notional whole of life earnings figure for GPs of $1,401,000.

As described, the systematic process for producing a fair and reasonable value for E_{gp} necessarily mixed quantitative analysis (the career models and the earnings comparisons) with qualitative judgements (the super-added, market and industry, and data bias factors). The process did not yield an hourly rate due to a number of disagreed matters within the Board, particularly in relation to whether and how the qualitative factors might be used.

For the purposes of taking the analysis to the next step (to allow the calculation of the index numbers), it was assumed that E_{gp} should be around the market norm. By making this assumption, a reasonable interpretation of the remuneration data might be that (in hourly equivalent terms) E_{gp} should be between $65 and $75 per hour. **This result is illustrative, as the impact of the disagreed super-added factors, industry and market factors and the potential data bias has not been included. This remuneration range has, however, been used in the next Chapter to calculate the index numbers.**

3.8.4 Determining the rate per unit of work for GPs

Once the hourly remuneration reference rate (E_{gp}) had been calculated, the task for the Relative Value Study (RVS) was to use E_{gp} to calculate the remuneration rate per unit of work (define as EW_{gp} for the purposes of this discussion). This task was not within the terms of reference for the RRS, however, as per the Board's request a high-level methodology for calculating EW_{gp} has been developed and included in this report.

The key product of the work in term of reference (b) was the fair and reasonable annual income for GPs (which led to the calculation of E_{gp}). Work value points generated by the GPWVPS were a critical determinant of this annual income. In deriving the work value points, the medical work of a sample of GPs was considered (ie not just consultation or not just procedures or not just enhanced primary care items). The mean work value points were then used to derive E_{gp}. Accordingly in deriving EW_{gp} the **average service mix** of GPs must be used (ie not just consultations). A possible method for carrying out the work is set out below.

(1) Determine the average service profile for a full-time GP. Using the Medicare database (preferably the most recent data for doctors in the target population as defined by the GPWVPS sampling strategy), determine the proportion of services against each item number that makes up the average service mix.

(2) Translate to the new MBS item number structure. Map the item numbers present in the average service mix to the new item number structure (which has restructured the existing GP attendance items based on time and content of service) to produce an average service mix for GPs using the new item number structure.

(3) Calculate the number of services that can be provided in a standardised year. Using data on standard time for each service from the Professional Relativities Study, calculate the number of services in the average service mix that can be performed within the standardised working year.

(4) Calculate the number of relative value units generated in a standardised year. Using the standardised annual service profile and the results of the PRS, calculate the number of work value units generated by the average service profile in a year.

(5) Calculate EW_{gp}. Divide the number of relative value units generated by the average GP service mix in a standardised year into the fair and reasonable annual earnings for GPs to produce EW_{gp}.

This process should produce the best single point estimate for EW_{gp}. As a matter of assurance, it is suggested that the calculations are repeated for various subsets of GPs. For example, the

results of the GPWVPS can be used to produce fair and reasonable annual earnings for metropolitan GPs or for rural GPs or for GPs in specified age cohorts. It may be valuable to repeat the process suggested above to ensure that the EW_{gp} produces remuneration outcomes that are close to the GPWVPS modeling for these groups. It may be that some iteration is required to arrive at a value for EW_{gp} that produces the intended remuneration outcomes. In so doing the impact of the standardised GP working hours (40 hours per week for forty-six weeks per year) on income should be considered. In particular, the effect of the use of locums (used by GPs to keep their practices operational while they are on annual leave for four of the six standardised non-working weeks) on the remuneration outcome should be considered in determining EW_{gp}.

Naturally, this whole process is subject to the limitation that the GPs' service mix may change as a result of implementation of the new item and fee structures. A process of post RVS implementation review and possible adjustment would be required to deal with this limitation.

4

Measuring human capital differences between doctors

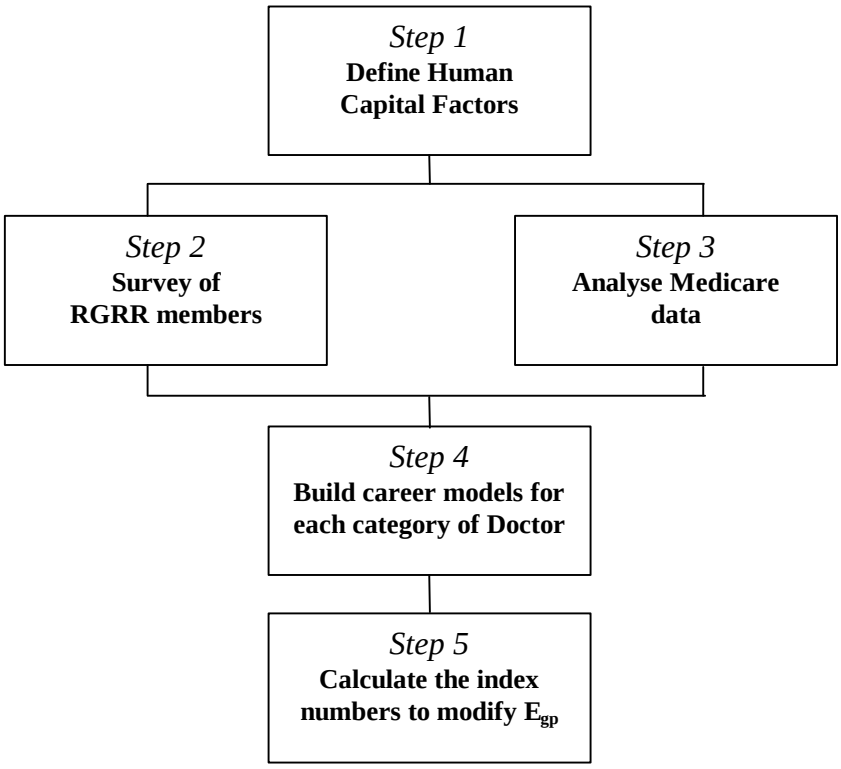
Term of reference (d) for the Remuneration Rates Study (RRS) specifically required HMA to:

> ***"identify and quantify the factors which discriminate in terms of human capital eg training and working life, (but, excluding those factors already included in the professional component relativities) which distinguish between different categories of doctors and expressing those factors in the form of a percentage of the base rate for each category"***

4.1 METHODOLOGY

The methodology for term of reference (d) was based around the development of standardised career models for the twenty-seven categories of doctor represented on the RGRR. Figure 7 illustrates the methodology for term of reference (d).

Figure 7: Methodology for term of reference (d)



The percentage loading (the percentage of the base rate as expressed in the terms of reference) was derived from the standardised career models for each of the identified medical categories.

The models were designed to quantify the impact of the different human capital factors applying to each of the twenty-seven categories represented on the RGRR. For example, the general surgeons' model generated an index on the remuneration reference rate (for GPs) that would result in general surgeons earning the same amount (in NPV terms) across their career as GPs. Importantly the models considered only intellectual capital factors (eg length and costs of training, requirement for CME) and not the differences in the work performed (as this was considered in the PRS) or the differences in the costs of being in practice (as this was considered in the PCS).

For this purpose, the Board approved the development of a standardised model for each of the twenty-seven medical categories that had a representative on the RGRR. Following development of the first draft models, the physician sub-specialty groups advised that they wished to be modeled as one homogeneous group. Accordingly, twenty career models were developed with the eight physician sub-groups being consolidated into one larger group.

The principal information sources for preparing the models were the results of a survey of RGRR members (the "human capital factor survey"). This survey sought information on the typical progression of doctors in each category from undergraduate education through to retirement. Issues covered included the length of the fellowship training program, typical pre and post fellowship training periods, requirement for CME activities, and typical retirement ages. Throughout the whole process of developing the models the Board adopted the principle that typical, rather than minimum or average times was used.

Results of the human capital factor survey were supplemented by a series of direct enquiries made to medical Colleges and the medical schools at Universities. The information obtained from this process focused on resolving issues, particularly the modelling of CME time input (which in the end the Board decided to leave unresolved). Also all the career models were refined through three draft stages (sometimes four) by working with the RGRR (as a group) and by a number of follow-up discussions with individual RGRR members and the Colleges and sub-Specialty Societies they represented.

The other major input into the career models was a comprehensive analysis of the Medicare database. First cross sectional data from 1998/99 were analysed to determine the number of in-scope doctors and their career earnings profiles. Longitudinal data from 1994/95 to 1998/99 were then used to examine issues such as the age at which doctors first accessed Medicare in their chosen specialty and the age at which they retired (including their retirement rate). These data analyses were designed to support and corroborate the information obtained through the human capital factor survey.

4.2 HUMAN CAPITAL FACTORS

The first step in the process was to identify the human capital factors to be considered in developing the standardised career models. This process included a review of the literature, which was found to be relatively sparse on this issue, as well as a series of discussions with the RGRR and the Board. Through this process eight human capital factors that could potentially be included in the career models were identified.

4.2.1 Length of training program

The length of training program factor was defined by the time required to attain the minimum level of qualification necessary to practice as a doctor in the subspecialty/craft group. For example, for GPs it was the time required to obtain a FRACGP and for general surgeons it was the time required to obtain a FRACS. Data on training programs and the time required to complete them was obtained from the medical Colleges and Societies via their representatives on the RGRR. For the most part, these data allowed identification of the minimum and typical time required to complete the programs. Through discussions with both the Board and the RGRR it was decided that the typical practice entry age was preferred to the minimum practice entry age. This conclusion effectively meant that typical training time was preferred to minimum training time. Typical time was determined from the responses to the human capital factor survey supported by an analysis of the Medicare database.

4.2.2 Intensity of training

Intensity of training refers to the effort required to successfully complete the medical training program. It was initially raised as a potential human capital factor by some RGRR members, in addition to the time required to complete the training program. Discussions within the RGRR did not produce an acceptable definition (or measure) of intensity of training. Subsequent RGRR discussions concluded that while it might have been desirable to differentiate between the intensity of some training programs, such differentiation was impractical. Accordingly it was agreed that intensity of training should not be considered as a differentiating factor between medical categories. This left length of training (time required) as the major differentiating factor relating to initial training.

4.2.3 Requirement for postgraduate training

Survey returns from RGRR members indicated that postgraduate qualifications (defined as qualifications beyond the initial fellowship of the College that allowed registration to practise) were a feature of the training and education of doctors in many subspecialties/craft groups. For the most part, these qualifications were not, strictly speaking, necessary to enable practitioners to draw on Medicare, but were obtained by a significant proportion of practitioners. The key issue was whether the standardised career model should include a component for obtaining postgraduate qualifications. As already indicated, discussions with the Board and the RGRR identified that the actual practice entry age profile should be used in the calculation of index numbers. This decision implied that the time taken to complete postgraduate training was included in the index number calculations to the extent that it influenced the typical amount of time required before entry into independent practice.

4.2.4 Requirement for continuing training/education

All subspecialty/craft groups have requirements (although most of the programs are not compulsory) for Continuing Medical Education (CME). Returns from RGRR members identified typical CME activities undertaken by doctors in the subspecialty/craft groups they represented. In many cases the level of CME activity identified was well above the minimum required to comply with the program. Again a key issue became whether the allowance for CME time in the standardised career model should reflect minimum time required to maintain registration or the typical time input. The CME issue proved to be the most difficult to resolve. The Board decided that typical CME time should be modelled, however, it proved to be very difficult for the Board to agree on the typical CME time for each medical category.

Two rounds of investigations were carried out including a supplementary survey (to the human capital factor survey) of RGRR members, and a series of follow-up discussions were initiated. Through this process it became clear that there were considerable difficulties in comparing CME programs across the medical craft groups. Whilst it would have been possible, with considerable effort, to produce a reasonable comparison of the CME programs if only minimum time was considered, it proved to be impossible (within the framework of the RRS) to do so using typical time. Even comparisons based on minimum time would be challenging, given that the types of activities that are counted and the credit points allocated to each activity vary considerably across the craft groups.

Table 21 summarises the original and revised submissions in respect of CME time for each medical category and assesses the quality of the supporting evidence. Categories of evidence ranged from one, which represented an expert opinion by a representative of the craft group; two, which represented an opinion based on the results of a "once-off" survey; and three, which represents a figure drawn from an ongoing data collection designed to capture CME time (voluntary CME participation). Category four was the same as category three except CME participation was compulsory.

Table 21:Comparison of reported CME times

Medical Category	CME time in hours per year		
	Original survey	**Follow-up survey**	**Category of Evidence**
Anaesthetists	200	290	2
Cardiothoracic Surgeons	200	200	1
Colorectal Surgeons	170	N/P	1
Dermatologists	210	209	1
Emergency Physicians	250	N/P	1
ENT Surgeons	280	N/P	1
General Practitioners	100	120	4
General Surgeons	N/P	220	1
Neurosurgeons	240	N/P	1
Obstetricians & Gynaecologists	175	N/P	1
Ophthalmologists	198	232	3
Orthopaedic Surgeons	N/P	N/P	-
Paediatric Surgeons	230	N/P	1
Physicians	220	229	3
Plastic Surgeons	120	N/P	1
Psychiatrists	150	201	3
Radiation Oncologists	N/P	200	1
Rehabilitation Physicians	125	N/P	1
Urologists	175	N/P	1
Vascular Surgeons	500	N/P	1

N/P Not Provided

Analysis of the table shows that the predominant figure was 200 hours per year across the groups. There were some outliers: the vascular surgeons in the first survey and the anaesthetists in the second survey. Most of the information obtained was based on category one evidence. Accordingly, it was difficult to use the actual estimates from these groups with

confidence. Based on the information available, it was concluded that there were real differences in CME between GPs and (at least some) specialist groups. The real difference was highlighted by contrasting the GP CME figure of 120 hours (based on category four evidence) with the figures of 229 for physicians, 232 for ophthalmologists, and 201 for psychiatrists (based on category three evidence); and 290 for anaesthetists (based on category two evidence).

Due to the difficulties in resolving the issue, four models for CME time were developed from the available data. The first, a one-band model involved assuming that CME was undifferentiated across the craft groups. The second, a two-band model put GPs into 120 hour band and all other groups into the two hundred hour band. The third model created three bands at 120, 170 and 230 hours and placed craft groups into each band according to the survey results. The fourth model created four bands at 120, 170, 200 and 230 hours and placed groups into each band. The placement of craft groups into each CME time option is shown in Table 22.

Table 22: Classification of CME time into bands

Medical Category	CME time in hours per year (option)				
	category of evidence	**one-band**	**two-band**	**three-band**	**four-band**
Anaesthetists	2	120	200	170	200
Cardiothoracic Surgeons	1	120	200	170	170
Colorectal Surgeons	1	120	200	170	170
Dermatologists	1	120	200	170	170
Emergency Physicians	1	120	200	170	170
ENT Surgeons	1	120	200	170	170
General Practitioners	4	120	120	120	120
General Surgeons	1	120	200	170	170
Neurosurgeons	1	120	200	170	170
Obstetricians & Gynaecologists	1	120	200	170	170
Ophthalmologists	3	120	200	230	230
Orthopaedic Surgeons	-	120	200	170	170
Paediatric Surgeons	1	120	200	170	170
Physicians	3	120	200	230	230
Plastic Surgeons	1	120	200	170	170
Psychiatrists	3	120	200	170	200
Radiation Oncologists	1	120	200	170	170
Rehabilitation Physicians	1	120	200	170	170
Urologists	1	120	200	170	170
Vascular Surgeons	1	120	200	170	170

All these options were input into the index numbers model and are reported later in this Chapter. Review of the data demonstrated the importance of the CME issue as the choice of modelling approach had a significant impact on the final index numbers. The Board decided that the final decision on which CME time model to use would be made outside the RRS.

4.2.5 Career span

The career span represents the time over which human capital is "consumed". Human capital that is consumed over a shorter period needs to be remunerated higher than human capital that is consumed over a longer period to achieve the same remuneration outcome (this principle is the essence of developing the index numbers). The Board decided that career span should be a factor in the standardised career model and that it should be standardised. The major points of standardisation were the entry and exit (retirement) ages. It was also relevant to consider the age at entry into independent practice as the difference between that age and the retirement age determines the career span over which the built up intellectual capital is consumed.

Accordingly, it was determined that the starting age for the models would be standardised and the models assumed that all doctors start their undergraduate education in the year they turn eighteen. For age of entry into independent practice, it was decided that the age profile in the standardised career model should reflect the age profile derived from analysis of the Medicare data (and supporting information). Following this principle, the age at entry into independent practice was different for each category of doctor (depending on length of training). It was also decided that the career model should have a common exit age. Accordingly, 60-64 was the last age cohort considered, implying retirement on reaching age sixty-five.

4.2.6 Career earnings pattern

The earnings pattern from independent practice across a career varied across the categories of doctor. Review of the Medicare data showed that doctors in some medical categories seemed to reach peak income fairly quickly, held that level for most of their career and then tail off. Doctors in other categories seemed to take considerably longer to reach peak earnings and also to exhibit tailing off. It was theoretically possible to recognise multiple levels of independent practice, for example low earning years, medium earnings years, high earning years, in the standardised career models. However, given the use of an NPV of lifetime earnings approach, the differential career earnings patterns were not considered to be a problem (income earned in later years was weighted lower than income earned in earlier years by using the NPV approach). The use of three different stages of independent practice would have added unnecessary complexity to the standardised career models.

4.2.7 Retirement patterns

The retirement patterns factor could be separated into two parts. The first part dealt with the issue of early retirement before the standardised exit age. To the extent that some groups of doctors are forced (rather than elect) to retire before age 65, then there was a case to include early retirement as a factor in the standardised career models. In this circumstance the need to retire was defined as the doctor's intellectual capital had been consumed (i.e. s/he could no longer practice in their chosen sub-specialty). Resolution of this issue was informed by a detailed analysis of the Medicare data, following a cohort of doctors from the age group 55-59 to the age group 60-64 (see below).

The second part of the retirement patterns factor dealt with the possibility that doctors in a number of the categories (particularly surgeons) changed their pattern of practice in the latter years of their career. The key to considering this human capital factor was whether the change impacted on income earning capacity from independent practice. A measurable and differential change in income earning capacity across the doctor groups was required to support a distinction in the career models between the earlier independent practice years and the later

ones. Again, resolution of this issue was informed by a detailed analysis of the Medicare data. Both the mix of services from which income was derived in earlier years of career relative to later years and the income generating capacity were considered. For example, if a doctor continued to work and earn income (i.e. did not retire), then there was no argument for modifying the hourly rate for surgeons (for example) on the basis that some of them may do only consultative work later in their career.

4.2.8 Impact of work on lifestyle

This human capital factor was taken directly within the RRS terms of reference. Discussions within the RGRR failed to identify a reasonable method to quantify the impact of work on lifestyle. In fact, it was concluded that it was too difficult to find objective measures that differentiated the medical categories on this factor. In considering this issue the Board decided that the preference was to recognise that work needed to occur outside of normal hours and pay a loading for that work when it occurred. Accordingly, this factor was not further pursued as part of the development of the standardised career models.

4.2.9 Summary

Table 23 summarises the human capital factors considered for inclusion in the career models and the position on each. The Board reached an agreed position on all the factors except the treatment of CME time input.

Table 23: Human capital factors considered for inclusion in career models

Factor	Position
1 Length of training	Included in career models, agreed by Board
2 Intensity of training	Included in career models, agreed by Board
3 Requirement for postgraduate training	Included in career models (to the extent supported by the data), agreed by Board
4 Continuing medical education	Four options developed for inclusion in career models, Board decided to defer decision
5 Career span	Included in career models and standardised where appropriate, agreed by Board
6 Career earnings pattern	Excluded from career models, agreed by Board
7 Retirement patterns	Included in career models (to the extent supported by the data), agreed by Board
8 Impact of work in lifestyle	Excluded from career models, agreed by Board

4.3 BUILDING THE CAREER MODELS FOR EACH CATEGORY OF DOCTOR

As summarised in the methodology, the standardised career models were developed by defining six major phases over the course of a full medical career as follows:

- Undergraduate education;
- Pre-fellowship;
- Fellowship training;
- Post-fellowship;
- Independent practice; and
- Retirement.

All physician sub-specialties associated with the RACP were treated as a single group (physicians) for the purposes of the career modeling exercise. The physician group described in the career model comprised the following sub-specialties:

- General physicians;
- Cardiologists;
- Neurologists;
- Gastroenterologists;
- Rheumatologists;
- Paediatricians;
- Renal Physicians; and
- Thoracic physicians.

4.3.1 Number of in-scope doctors

The number of doctors in each specialty group for the 1998/1999 financial year, as reported in the Medicare database is shown in Table 24.

Table 24: Number of Doctors by Specialty 1998/99

Specialty	Number of Doctors	% of Total
General Practitioner	17,836	55.4%
General Practitioners	***17,836***	**55.4%**
Cardiologist	578	1.8%
General Physician	1,952	6.1%
Gastroenterologist	385	1.2%
Neurologist	277	0.9%
Paediatrician	746	2.3%
Renal Physician	119	0.4%
Rheumatologist	155	0.5%
Physicians	***4,212***	**13.1%**
Cardiothoracic Surgeon	101	0.3%
ENT Surgeon	329	1.0%
General Surgeon	1,181	3.7%
Neurosurgeon	104	0.3%
Ophthalmologist	708	2.2%
Orthopaedic Surgeon	659	2.0%
Paediatric Surgeon	47	0.1%
Plastic Surgeon	223	0.7%
Urologist	223	0.7%
Vascular Surgeon	111	0.3%
Surgeons	***4,824***	**15.0%**
Anaesthetist	2,022	6.3%
Dermatologist	298	0.9%
Emergency Physician	91	0.3%
Obstetrician/Gynaecologist	907	2.8%
Psychiatrist	1,735	5.4%
Radiation Oncologist	146	0.5%
Rehabilitation Physician	122	0.4%
Other	***5,321***	**16.5%**
Total	***32,193***	**100.0%**

Source: Medicare Database 1998/99 – DHAC

Review of Table 24 shows that GPs were by far the largest group in the Medicare data comprising over half of all the doctors being analysed. Some medical specialties within scope, such as Emergency Medicine, have a high proportion of salaried work and do not spend significant amounts of their time providing services that attract Medicare rebates. Colorectal surgeons and Thoracic physicians were not separately identifiable from the Medicare database, although they had individual representatives on the RGGR. At the request of the Colorectal Surgical Society of Australia, specific data for Colorectal surgeons were extracted from the Medicare database and a separate career model was constructed for that group.

4.3.2 Undergraduate education

The undergraduate education component of the model was the same for all specialties. The key source of the data used in compiling the profiles was the AIHW/AMWAC report *'Characteristics of students entering Australian medical schools 1989 – 1997'*. The following tables provide the background information used to determine undergraduate characteristics. As not all undergraduate medical degrees take the same time to complete, an average length of the course was calculated based on the distribution of students across the Universities. Table 25 shows that distribution as at 1998.

Table 25: Profile of medical students as at 1998 by University

University	Student numbers	Time to complete (years)	Percentage of all medical students
Flinders University	56	7/8	5%
Monash University	135	6	11%
University of Adelaide	91	6	7%
University of Melbourne	180	6	15%
University of New South Wales	144	6	12%
University of Newcastle	64	5	5%
University of Queensland	228	7/8	19%
University of Sydney	143	7/8	12%
University of Tasmania	59	6	5%
University of Western Australia	121	6	10%
Total students	1,221		

Source: Medical Labour Force Statistics – 1997 – *AIHW*

Using the profile in Table 25, the percentages passing through the various degree courses were determined. The postgraduate medical courses (Sydney, Queensland and Flinders universities) were counted as seven or eight year courses depending on the length of the initial undergraduate degree. Table 26 presents the percentage of students by length of course.

Table 26: Percentage of medical students by length of course – 1998

Degree length	Student numbers	% of all medical students
Five year degree	64	5%
Six year degree	730	60%
Seven or eight year degree	427	35%
Total students	1,221	100%

Source: Medical Labour Force Statistics – 1997 – *AIHW*

Using these data it was determined, for the purposes of the standardised career model, that the majority of doctors completed their undergraduate degree at the age of twenty-four and all doctors finished undergraduate education at age twenty-five. Data on the background (in term of their undergraduate degrees) of medical students undertaking postgraduate programs were obtained from the University of Sydney. These data showed that about 80% of the students came from a three-year undergraduate degree course and 20% from a four-year course

(including honours students). Medical graduates from postgraduate programs were spread across the seven and eight year programs in accordance with this ratio.

4.3.3 Pre-fellowship

The pre-fellowship period was defined as the typical period spent from internship to gaining formal entry into a fellowship training program. Data regarding this period were drawn largely from the human capital factor survey responses and from submissions by RGRR members of behalf of their medical craft groups. Using these data, assumptions were made about the minimum period of clinical experience required before commencing the fellowship program, as well as the maximum and the usual time required before commencing the fellowship program. Based on these assumptions, Table 27 shows that the standardised career models reflected a range in pre-fellowship clinical experience from two to five years with four years being the most common required period.

Table 27: Pre-fellowship clinical experience

Medical Category	Minimum period (years)	Maximum period (years)	Average (years)
Anaesthetists	2	4	3.0
Cardiothoracic Surgeons	3	5	4.0
Colorectal Surgeons	3	5	4.0
Dermatologists	2	5	3.8
Emergency Physicians	2	4	3.0
ENT Surgeons	3	5	4.0
General Surgeons	3	5	4.0
GPs	1	4	2.4
Neurosurgeons	3	5	4.0
Obstetricians & Gynaecologists	2	4	2.8
Ophthalmologists	2	5	4.0
Orthopaedic Surgeons	4	5	4.5
Paediatric Surgeons	3	5	4.0
Physicians	2	4	2.3
Plastic Surgeons	4	5	4.5
Psychiatrists	2	5	3.4
Radiation Oncologists	2	4	2.8
Rehabilitation Physicians	2	3	2.5
Urologists	3	5	4.0
Vascular Surgeons	3	5	4.0

Within the standardised career models, GPs and physicians were very similar in spending the minimum period of pre-fellowship training before commencing formal fellowship training. The greatest period of clinical experience before commencing formal fellowship training, 4.5 years, was spent in two surgical groups.

4.3.4 Fellowship

The fellowship training period was defined as the period from the point that the relevant medical College considered being the point of formal entry into the training program to the completion of the fellowship. The time taken to complete the fellowship was determined by analysing responses to the human capital factor survey, submissions by professional groups, educational reports and the publications of the Colleges. Known failure rates were incorporated into the standardised career models, but repeat failure at any given stage in the Fellowship training program was not allowed for the purposes of the models. Table 28 compares the length of different fellowship training programs reflected in the career models.

Table 28: Length of fellowship training

Medical Category	Minimum Time (years)	Maximum Time (years)	Average (years)
Anaesthetists	5	7	5.6
Cardiothoracic Surgeons	6	7	6.2
Colorectal Surgeons	4	5	4.3
Dermatologists	4	5	4.3
Emergency Physicians	5	7	5.7
ENT Surgeons	4	5	4.3
General Surgeons	4	5	4.3
GPs	3	4	3.1
Neurosurgeons	5	6	5.3
Obstetricians & Gynaecologists	6	8	6.3
Ophthalmologists	5	6	5.2
Orthopaedic Surgeons	4	5	4.2
Paediatric Surgeons	5	6	5.3
Physicians	6	8	6.6
Plastic Surgeons	5	6	5.3
Psychiatrists	5	7	5.7
Radiation Oncologists	5	7	5.8
Rehabilitation Physicians	6	8	6.8
Urologists	5	6	5.2
Vascular Surgeons	6	7	6.3

The number of years taken by doctors to successfully complete the various fellowship training programs ranged from 3.1 to 6.8 years. GPs were required to spend the least time in fellowship training. Physicians (including rehabilitation physicians) undertook the longest fellowship program. The most usual period required for fellowship training was four to five years.

4.3.5 Post fellowship

The post fellowship period was defined as the time from obtaining a fellowship qualification until entering independent practice. Again, responses to the human capital factor survey and College publications were the main sources of information for quantifying the time spent in post fellowship training. Periods of post fellowship discretionary training were included in the standardised career models so as to produce an age profile for entry to independent practice that was consistent with observed experience (determined by analysing the Medicare data).

For some specialties post fellowship time included mandatory post fellowship diplomas, whilst for others it reflected an experience building phase in the career (eg in a research fellowship position or in a hospital overseas). Table 29 compares the length of time spent undertaking post-fellowship training by the various specialties.

Table 29: Post fellowship training times

Medical Category	Minimum Time (years)	Maximum Time (years)	Average (years)
Anaesthetists	1	2	1.5
Cardio Thoracic Surgeons	2	3	2.5
Colorectal Surgeons	1	2	1.5
Dermatologists	1	2	1.5
Emergency Physicians	1	2	1.5
ENT Surgeons	1	2	1.5
General Surgeons	1	2	1.5
GPS	0	2	0.8
Neuro Surgeons	2	3	2.5
Obstetricians & Gynaecologists	0	2	1.3
Ophthalmologists	0	3	1.4
Orthopaedic Surgeons	1	2	1.5
Paediatric Surgeons	2	3	2.5
Physicians	0	6	2.9
Plastic Surgeons	2	3	2.5
Psychiatrists	0	2	1.2
Radiation Oncologists	0	2	1.0
Rehabilitation Physicians	0	2	1.0
Urologists	1	2	1.5
Vascular Surgeons	2	3	2.5

The number of years of post-fellowship training time ranged from 0.8 to 2.9 years. The longest assumed time of 2.9 years occurs for the consolidated physicians group and reflected the relatively larger number of physicians that engaged in extended periods of post fellowship training. The most usual period required for post-fellowship training was 1.5 years.

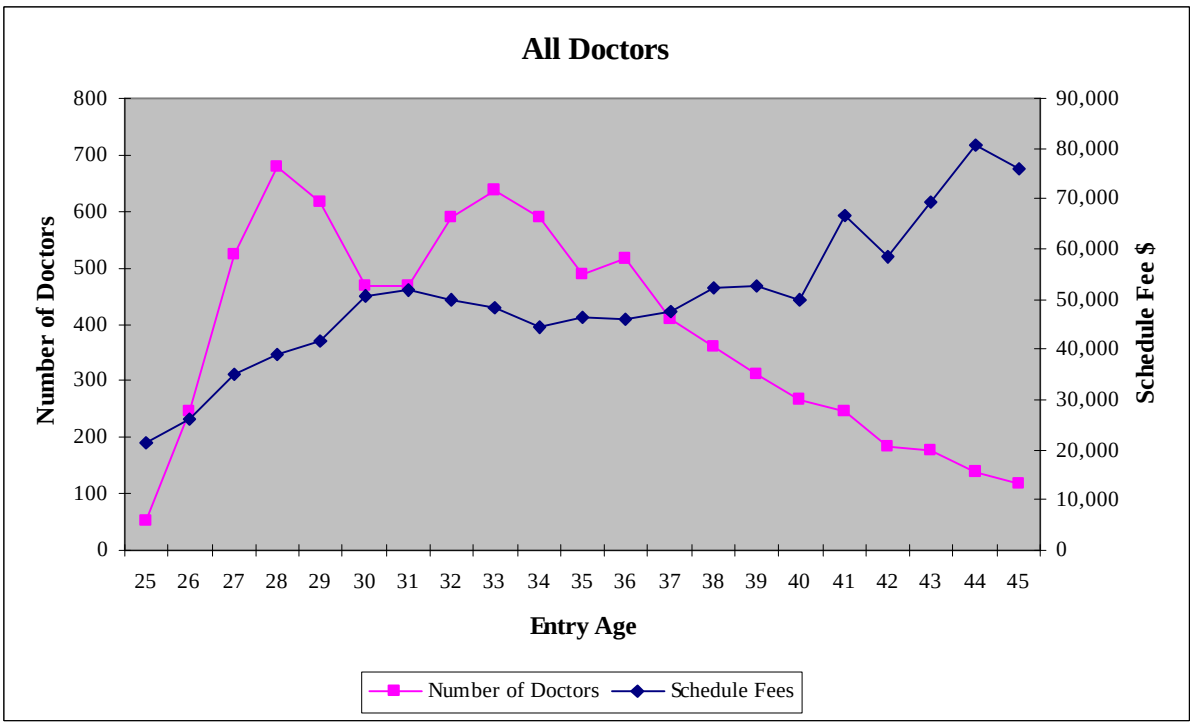
4.3.6 Independent practice

The point of entry into independent practice was considered to be the time at which the doctor typically commenced practising independently as a Fellow of his/her chosen specialty. Delays in entering the specialty due to doctors entering from other medical categories or transferring from overseas were not counted in the standardised models. In practice, late entrants can be found within the age profile for a medical category but they were reflected in the standardised career model (it is not reasonable to differentiate remuneration between specialties on the basis that one had a greater proportion of late entrants than another).

The Medicare database was used to give effect to the Board's decision that the typical independent practice age should be the point at which doctors start drawing on the MBS. Using the Medicare data 'age at first drawing profiles' were developed. To illustrate the

concept, the age at first drawing profile for all doctors who first accessed Medicare as Fellows of their respective Colleges from 1994/95 to 1998/99 is shown in Figure 8.

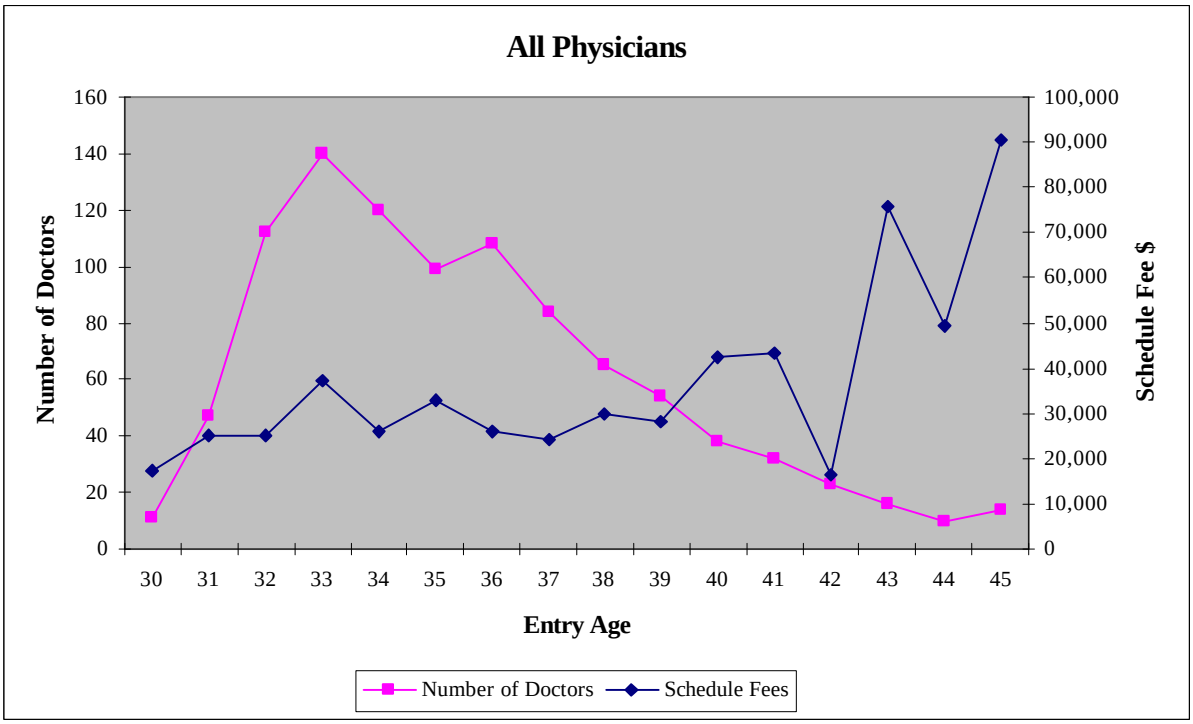
Figure 8: Age at first drawing on Medicare - all doctors



Source: Medicare database 1994/95 – 1998/99 DHAC

The graph is effectively bimodal. The peak at around twenty-eight years of age results from a large number of GPs entering at that age. The subsequent peak at around thirty-three years of age results from a large number of physicians entering at that age. This fact is illustrated by examining the age at first drawing graph for all physicians as shown in Figure 9.

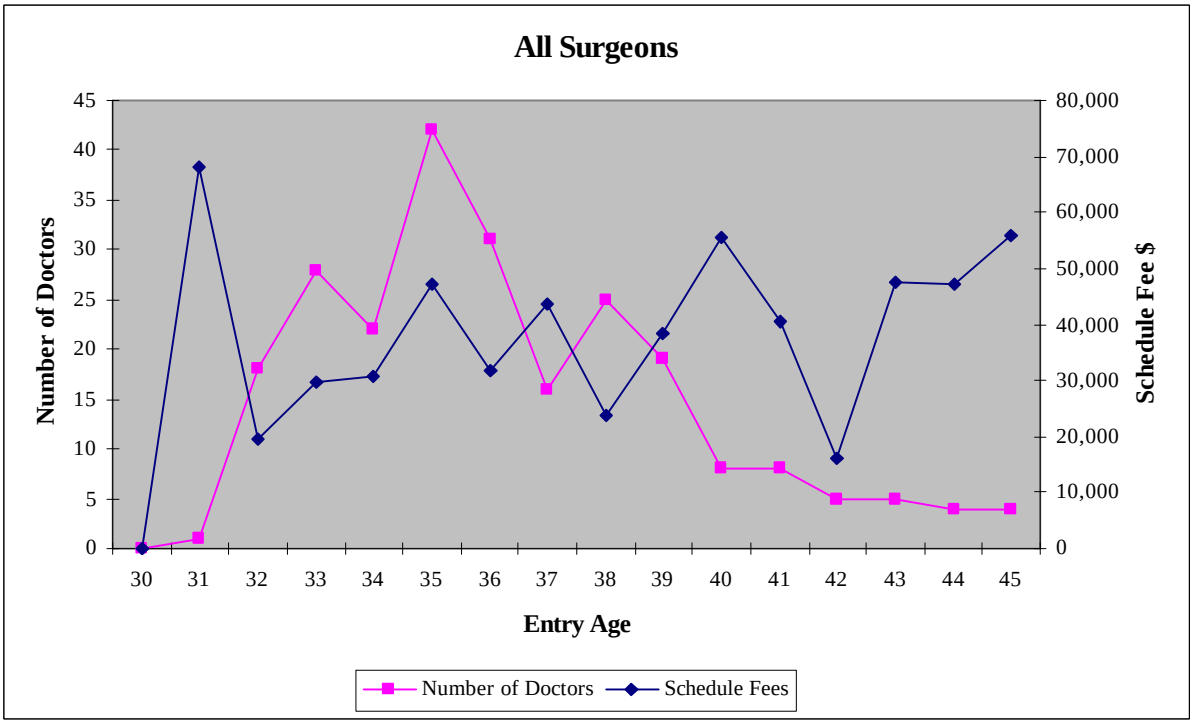
Figure 9: Age at first drawing on Medicare - all physicians



Source: Medicare database 1994/95 – 1998/99 DHAC

Review of Figure 9 confirms the modal entry age of thirty-three years for physicians. The physician numbers were sufficient to cause a local peak in the "all doctors" entry age profile. The surgeons entry age peak occurred at age thirty-five, as shown by Figure 10. However this peak did not cause a peak in the all doctors entry profile, as the numbers were too small relative to the total number of doctors.

Figure 10: Age at first drawing on Medicare - all surgeons



Source: Medicare database 1994/95 – 1998/99 DHAC

In using data similar to these graphs to develop the career models only, little weight was given to independent practice entry ages greater than forty. Doctors entering practice at this age were likely not to have commenced their undergraduate medical training at age eighteen (as required by the standardised career models). Alternatively, these doctors may have taken a break in their career or they may have retrained into the medical category from another category of doctor or they may have transferred from overseas. In all of these cases they were standardised out for the purposes of comparisons (on intellectual capital factors) between medical categories.

All the 'age at first drawing' graphs included the average Medicare schedule fees generated. These numbers were small reflecting the fact that doctors were not practising for a full year in their first year of independent practice (unless, by chance, they started practising and had their birthday on 1 July). It was also likely that, for most groups, there was some ramping up of earnings as experience increased. For these reasons, the standardised career models reflected only a very small proportion of fellows entering in the first year (usually between 1% and 5% of the group). This modelling position was consistent with what was observed from the data and the discussions within the RGRR.

Using these principles, there was a very strong correlation between the independent practice entry ages obtained from the standardised career models and what was observed in practice (taken from the human capital factor survey). Consistent with the agreed definition of typical length of training, the standardised career model entry ages are either the same as, or within one year of, what was observed in the Medicare database. In the cases where there was one year difference, the number of doctors involved was very small (often only one doctor). Table 30 illustrates this correspondence by comparing the ages at which specialists generally enter into independent practice. The age of the youngest doctors recorded in the Medicare database for the period 1994/95 to 1998/1999 is included for comparative purposes.

Table 30: Independent Practice Ages

Medical Category	Model Minimum Starting Age	Medicare Earliest Starting Age	Model Maximum Starting Age	Model Average Age
Anaesthetists	31	30	37	34.4
Cardiothoracic Surgeons	35	35	40	37.1
Colorectal Surgeons	32	N/A	38	34.2
Dermatologists	31	31	38	34.0
Emergency Physicians	32	32	38	34.6
ENT Surgeons	31	31	38	34.2
General Surgeons	32	32	38	34.2
GPs	27	26	35	30.7
Neurosurgeons	33	32	40	36.2
Obstetricians & Gynaecologists	31	31	38	34.6
Ophthalmologists	31	30	39	35.0
Orthopaedic Surgeons	32	32	38	34.6
Paediatric Surgeons	34	34	40	36.2
Physicians	31	30	42	36.2
Plastic Surgeons	35	35	40	36.7
Psychiatrists	31	31	39	34.7
Radiation Oncologists	31	31	38	34.0
Rehabilitation Physicians	32	31	38	34.7
Urologists	33	33	38	35.1
Vascular Surgeons	35	35	40	37.2

The specialty that recorded the youngest age by which most of its doctors were in independent practice was GPs. The standardised career models provide for five of the surgical sub-specialties having a small proportion of fellows that entered independent practice at age forty and for a small proportion of physicians to continue entering until age forty-two. The spread from the minimum age to the maximum expected age by specialty group for entering into independent practice was generally six years. Physicians had the maximum spread between the lowest and highest independent practice entry ages of eleven years. This spread was deliberately modelled, as this group exhibited the most variation, particularly in post fellowship training activities and time.

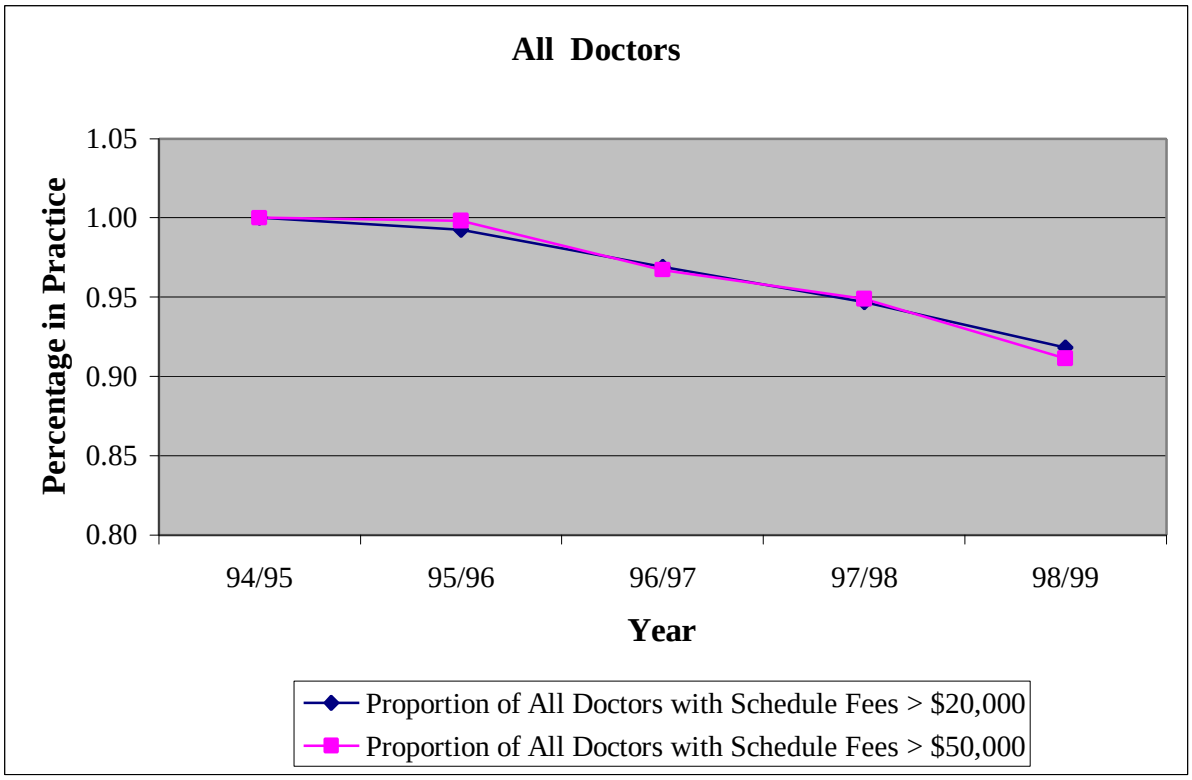
4.3.7 Retirement

For many specialties, retirement age was uncertain. Doctors may gradually move into other work, the retirement data may not be available, or the specialty may be so young that a pattern of withdrawal from practice has not been established. Most survey responses that mentioned retirement age referred to the period from sixty to seventy years as the most common age range for retirement. To give effect to the 'retirement patterns' intellectual capital factor two issues were examined in some considerable detail. The first issue was the actual retirement age, and the second was to examine a possible change in the mix of services provided as doctors near retirement (ie surgeons may do less surgery).

In respect of retirement age, a detailed analysis of the Medicare database was carried out. As many doctors continued drawing on Medicare until many years after they turn sixty-five (65.3% of all doctors aged sixty-five and above who had practised in 1994/95 and generated at least $20,000 in schedule fees still generated at least $20,000 in schedule fees in 1998/99). Even when the threshold figure was increased from $20,000 to $50,000 the proportion was still 61.7%.

Accordingly, a working definition of retirement was required for the purposes of analysing the Medicare data for the five years 1994/95 to 1998/99. After experimenting with a number of approaches, a simple definition was adopted based on the proportion of doctors who generated at least a threshold level of schedule fees in 1994/95 and who still generated that level in 1998/99. Figure 11 tracks the proportion of the 55-59 year age cohort that generated at least $20,000 in 1994/95 and those that generated at least $50,000.

Figure 11: Proportion continuing to generate threshold schedule fee levels -all doctors

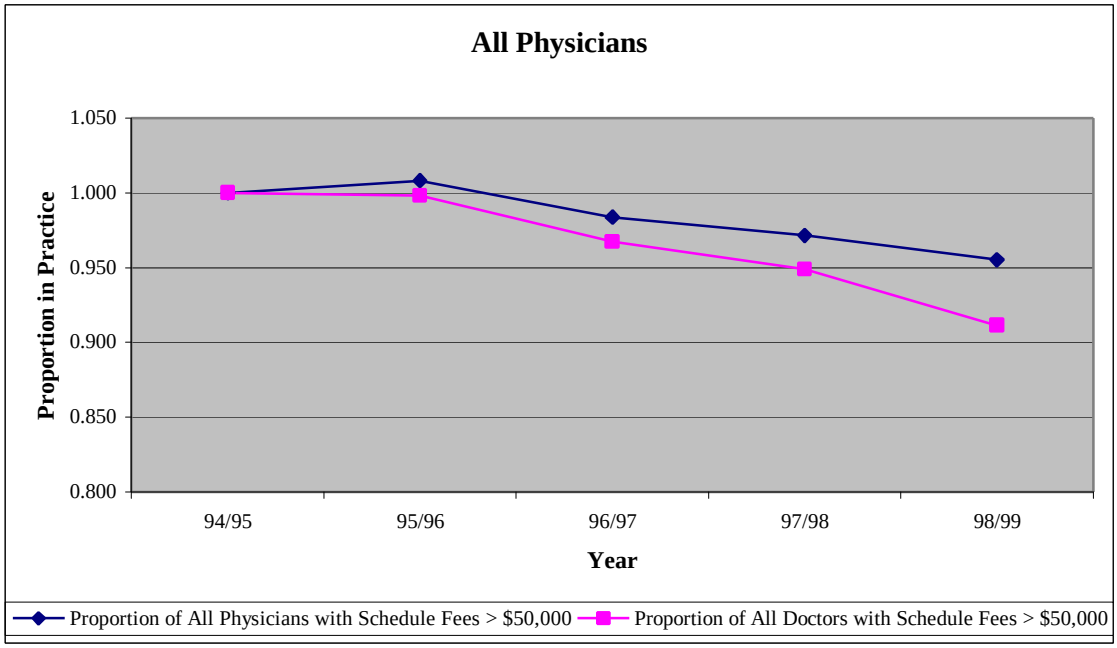


Source: Medicare database 1994/95 – 1998/99 DHAC

Examination of the graph shows that it made little difference as to whether the $20,000 (continuing practice proportion 91.8%) or $50,000 (continuing practice proportion 91.1%) schedule fee threshold was used to estimate the retirement proportions. Accordingly, the $50,000 threshold was adopted for the analysis.

Using this working definition of retirement, the central issue of whether there were significantly different retirement rates across the medical categories was investigated. The detailed category by category analysis is presented with the individual career models in the resource materials supporting this report. Data for the all physicians and all surgeons groups are presented in this report. Figure 12 presents the continuing practice proportions for all physicians and compares it to the profile for all doctors.

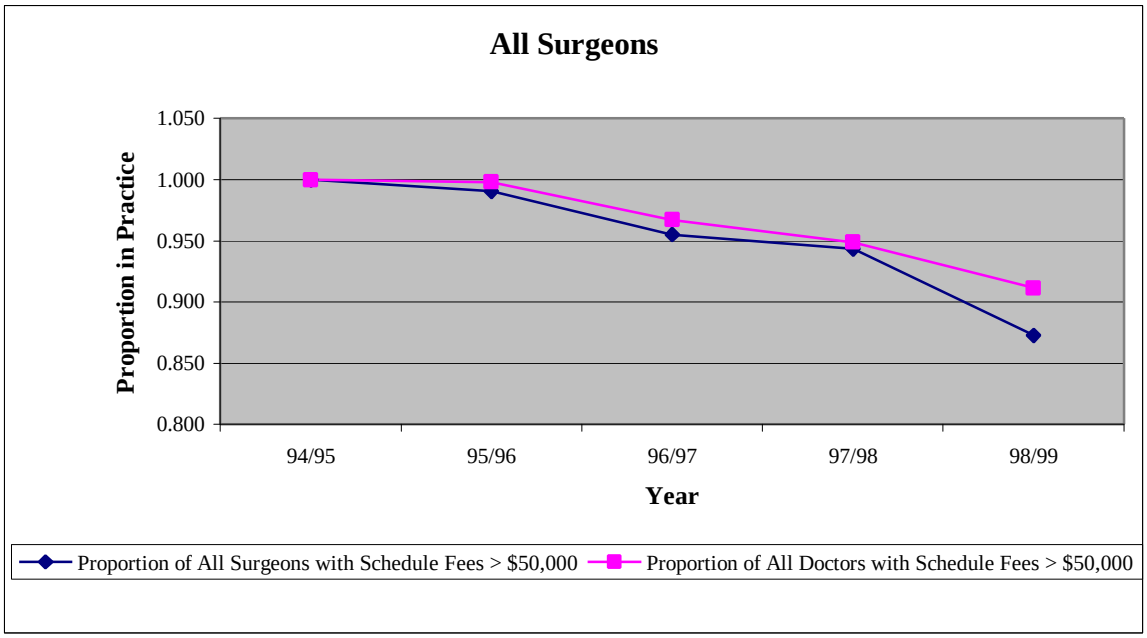
Figure 12: Proportion continuing to generate threshold schedule fee level - all physicians



Source: Medicare database 1994/95 – 1998/99 DHAC

Review of the Figure 12 shows that physicians retired at a slightly slower rate (continuing practice proportion 95.5%) than the "all doctor" average (continuing practice proportion 91.1%). Figure 13 compares the continuing practice proportions for surgeons, also using the $50,000 schedule fee threshold.

Figure 13: Proportion continuing to generate threshold schedule fee level - all surgeons

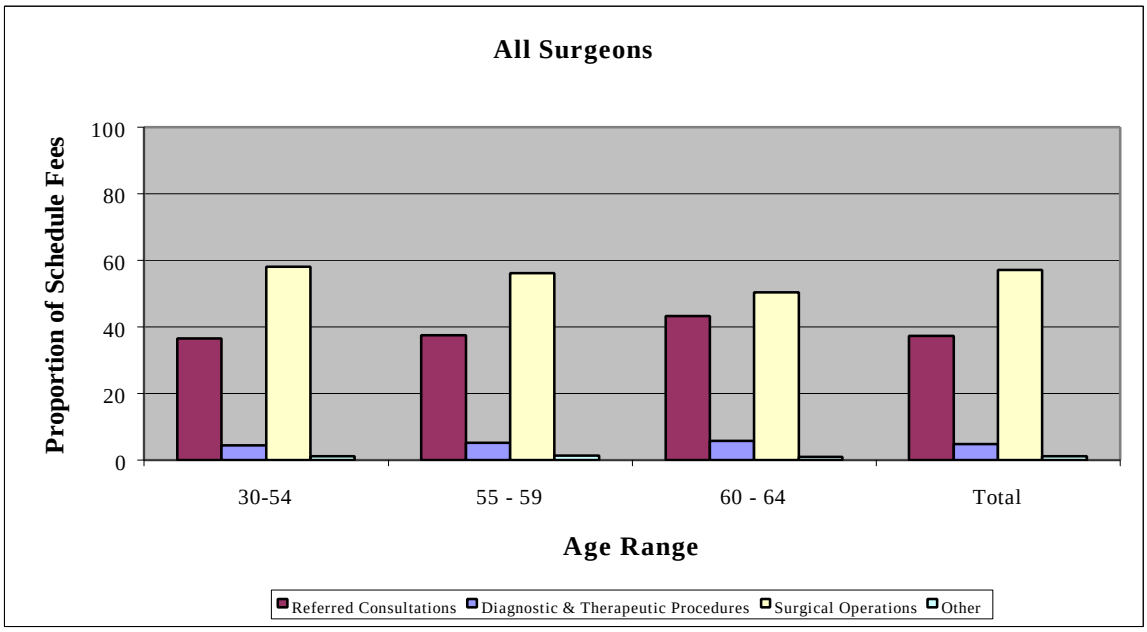


Source: Medicare database 1994/95 – 1998/99 DHAC

Review of Figure 13 shows that surgeons retired at a slightly faster rate (continuing practice proportion 87.3%) than the "all doctor" average (continuing practice proportion 91.1%). The difference between the continuing practice rates of the two groups was therefore 8.2%. Although this difference was measurable, it was not large enough to make any appreciable difference in the index numbers generated by the career models. Review of the individual medical categories highlighted some larger differences in retirement rates, but in a number of cases the number of doctors involved was very small (where one or two retirements make a significant difference to the results). For these reasons, a uniform retirement proportion of 90% was adopted to apply to all medical categories.

The second issue investigated using the Medicare data was the potential change in mix of services provided as doctors approached the end of their careers. Of particular interest was whether surgeons did less surgery. To examine this issue, the schedule fees generated by each doctor were classified into the major categories as defined in the MBS using the 1998/99 data. The proportions of schedule fee revenue for each type of service provided over the course of a career were then compared. As the principal focus was on changes at the end of the career all doctors aged thirty to fifty-four years were grouped into one cohort. Figure 14 shows the proportion for all surgeons.

Figure 14: Proportion of schedule fees generated by service type - all surgeons

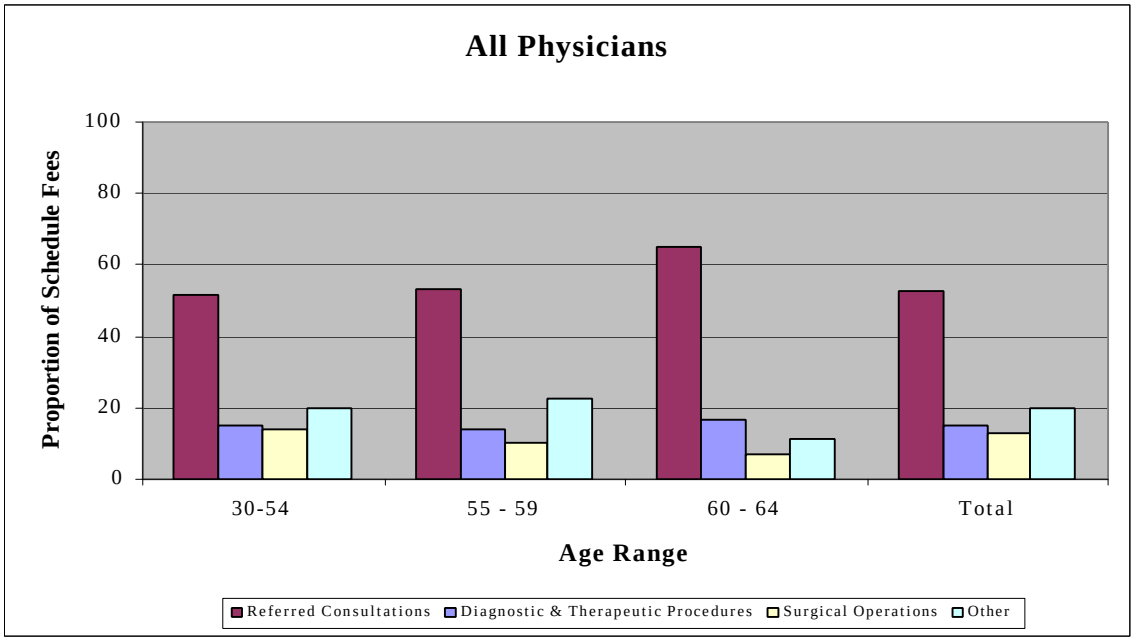


Source: Medicare database 1998/99 DHAC

Examination of the data shows that there was a measurable shift in the proportion of revenue that surgeons generated from performing surgery, particularly in the 60-64 year age cohort where the proportion was (50.3%) relative to the career average proportion of (57.0%). In dollar terms, surgeons generated average schedule fees of $91,970 from surgery at age 60-64 compared to the whole of career average schedule fees generated from surgery of $134,263, a difference of $42,293. The average schedule fees generated from all services provided by surgeons aged 60-64 was $182,923 compared to the whole of career average schedule fees generated from all services of $235,665, a difference $52,742. This latter difference suggested that schedule fee revenue drop from Medicare in the last five years of surgeons' careers was largely due to a reduction in surgery (both in terms of the proportion of schedule fees and total fees).

By way of comparison, similar data were examined for the all physicians group. Surgery performed by physicians (surgery is only a small proportion of a physician's work, performed mainly by procedural physicians) is defined as those items included in groups T8 and T9 of the MBS (the same definition as for surgeons). Figure 15 presents the proportion of schedule fees earned by physicians across the different service types.

Figure 15: Proportion of schedule fees generated by service type - all physicians



Source: Medicare database 1998/99 DHAC

Once again, examination of the data shows that there was a measurable shift in the proportion of revenue that physicians generated from performing surgery, particularly in the 60-64 year age cohort where the proportion was (7.1%) relative to the career average proportion of (12.9%). In dollar terms, physicians generate average schedule fees of $10,997 from surgery at age 60-64 compared to the whole of career average schedule fees generated from surgery of $26,920, a difference of $15,923. The average schedule fees generated from all services provided by physicians aged 60-64 was $155,819 compared to the whole of career average schedule fees generated from all services of $208,510, a difference of $52,691. Therefore, only some 30% of the overall schedule fee reduction could be accounted for by reductions in surgery.

In drawing conclusions the major points were:

- There was a measurable reduction in the amount of surgery performed by surgeons in the 60-64 year age cohort, both in terms of the proportion of schedule fees (6.7%) and total fees ($42,293) generated from surgery.
- Although a small proportion of their work, there was also a measurable reduction in the amount of surgery performed by physicians in the 60-64 year age cohort, both in terms of the proportion of schedule fees (5.8%) and total fees ($15,923) generated from surgery.
- Both surgeons ($52,742) and physicians ($52,691) experienced a significant drop in total schedule fees generated in the last five years of their careers.

On the basis of this information, it was decided not to make any specific modification to the career models across the medical categories. Coincidentally, the quantum of average fee decrease across the surgeons and physicians was almost the same. It is clear that although surgeons did less surgery late in their careers, which had a measurable impact on the average schedule fees they generated, physicians also did less surgery and less work overall resulting in a very similar impact on schedule fees generated.

4.3.8 Total training time

Table 31 shows the average total time spent in training represented in the career models for each medical category by combining the pre-fellowship, fellowship and post fellowship periods together (for the purposes of this comparison undergraduate education is excluded).

Table 31: Comparison of total training time by medical category

Specialty Group	Average total training time (years)
Anaesthetists	10.1
Cardiothoracic Surgeons	12.7
Colorectal Surgeons	9.8
Dermatologists	9.6
Emergency Physicians	10.2
ENT Surgeons	9.8
General Practitioners	6.3
General Surgeons	9.8
Neurosurgeons	11.8
Obstetricians and Gynaecologists	10.3
Ophthalmologists	10.6
Orthopaedic Surgeons	10.2
Paediatric Surgeons	11.8
Physicians	11.8
Plastic Surgeons	12.3
Psychiatrists	10.3
Radiation Oncologists	9.6
Rehabilitation Physicians	10.3
Urologists	10.7
Vascular Surgeons	12.8

The standardised career models show that GPs spent the least amount of time in training (6.3 years) and vascular surgeons the greatest amount of time (12.8 years).

4.4 CALCULATING THE INDEX NUMBERS

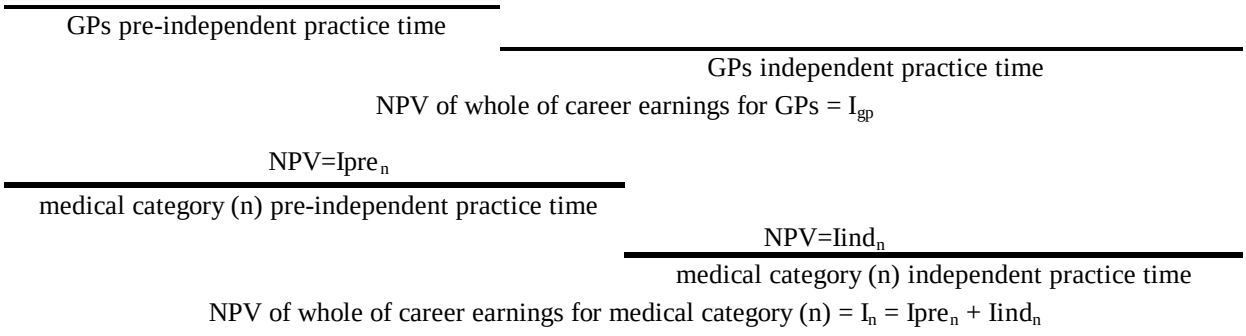
The ultimate outcome of the work on term of reference (d) was a set of index numbers, which could be used to modify the remuneration reference rate for GPs to produce remuneration reference rates for all the other categories of doctor. A computerised model that produces these index numbers was developed using the standardised career models as the key input and supported by a range of assumptions around the remuneration reference rate (E_{gp}), the discount rate for NPV calculations, the standardised number of hours worked, the level of CME time input, and the earnings rates and the education costs for pre-independent practice years. The completed index numbers model could not be used to produce the final index numbers until the remuneration reference rate was determined from the work on term of reference (b). As the Board did not reach agreement on the remuneration reference rate for GPs, this report presents index numbers for a series of values for remuneration reference rate. The chosen values are in

the range from $65 to $75 per hour (equivalent to $119,600 to $138,000 per annum using the Board's standardised input hours of 1840 per year). **The remuneration range and the associated index numbers are presented for illustrative purposes and are not intended to pre-empt any decision that might be made on the final remuneration reference rate.**

4.4.1 Conceptual overview

The key principle underlying the index numbers model was that it produced the percentage loading that needs to be applied to the reference rate for GPs to enable specialists to earn the same amount as GPs (in NPV terms) over their entire career. The model adjusted only for the agreed intellectual capital factors. Specifically, the model did not adjust for differences in the intensity of the work performed or differences in the practice costs incurred, which were dealt with in the PRS and PCS respectively. Figure 16 illustrates the concept.

Figure 16: Career model comparison



This figure defines the net present value (NPV) of GP earnings over the course of the career as I_{gp}. It defines the NPV of pre-independent practice earnings of medical category (n) as $Ipre_n$, the NPV of independent practice earnings of medical category (n) as $Iind_n$, with the NPV of the whole of the career earnings being I_n. The hourly rate for medical category (n) is simply that which results in:

$$Ipre_n + Iind_n = I_{gp}$$

The career model assumptions and E_{gp} define every variable in this calculation except for E_n. The formula can therefore be rearranged to calculate E_n. The mathematical representation of the model is presented in Appendix D.

4.4.2 Pre-independent practice income levels

The first step in deriving the index numbers was to determine the income levels of practitioners in each group prior to entry into independent practice. There were four distinct pre-independent practice career phases to address: undergraduate, pre-fellowship training, fellowship training and post-fellowship training. Table 32 shows the income data that was input into the index numbers model.

Table 32: Annual income by career stage for each medical category

Career stage	GPs	Other Medical Categories
Undergraduate	$7,000	$7,000
Pre-fellowship training		
- year 1	$39,500	$39,500
- year 2	$44,000	$44,000
- year 3	$48,000	$48,000
- year 4	$55,000	$55,000
- year 5	$58,500	$58,500
Fellowship training		
- year 1	$50,500	$58,000
- year 2	$55,500	$61,500
- year 3	$63,000	$65,500
- year 4	N/A	$68,000
- year 5	N/A	$74,000
- year 6	N/A	$78,500
Post-fellowship training	$70,000	$65,000

As is evident by reviewing Table 32, a yearly salary was applied at every stage of the index numbers models. Because the majority of the RACGP Training Program was not hospital based, different assumptions were used for GPs than those that were applied to the other categories of doctor. The most appropriate income figure to use in the model for each training year was based on the investigations described below.

- ***Undergraduate income***

There was a degree of subjectivity in the determination of undergraduate income as the earning levels of students varied considerably. Enquiries were made with some of the universities to determine if any surveys had been carried out on student earnings but no data were available. Accordingly, an alternative approach based on analysing the amount financial assistance available to students from Government was examined. Government financial assistance to students varied depending on parental income, personal income, whether the student lived at home, whether they were single, and whether they had children. With Youth Allowance and the highest rate (as at the reference date, December 1999) of assistance a student could receive up to $177.90 per fortnight (~$4,600 per annum) if they were living at home and up to $270.30 per fortnight (~$7,000 per annum) if they were away from home. Many students supplemented this income with part-time work (students can earn up to a further $230 per fortnight without any reduction in their Youth Allowance). Equally many students did not qualify for Youth Allowance because of parental income. As a standardising assumption, the highest level of Youth Allowance ($7,000 per annum) was used as the representative income for the undergraduate years of medical training.

- ***Pre-fellowship and fellowship training income***

For these stages, income levels were determined by drawing on hospital medical officer awards in each State (as almost all of the training was hospital based). The AMA document "*Medical*

Salaries, Sessional Rates, Fee and Conditions: Public Sector" July 1999 was used as the source of the figures. Salary figures for each year were determined by taking the population weighted average of the relevant salaries from the State-based Awards (salaries were adjusted for those States where salary packaging was used to provide income tax benefits to doctors). Only salary figures were used in the index numbers model (consistent with the standardised 40 hours per week assumption, no provision was made for overtime payments). The same salary numbers were used for each medical category except GPs. That assumption was based on the fact that interns, residents and registrars in all non-GP medical categories earned their salaries from hospital work, where the rates of pay were set by the State-based Awards.

In respect of GPs, further investigations were carried out, as the Basic, Advanced and Subsequent Terms (ie the last two years) of the RACGP Training Program were undertaken in community-based general practices. Information from the RACGP indicated that during the hospital training (first year), GP registrars were paid according to the RMO/HMO Award in their State. Accordingly, the weighted average of RMO/HMO salaries according to the progression in the GPs career model was used to derive a representative earnings level for first year GP Registrars. This method produced a representative salary of $50,500 per annum (compared to the equivalent figure of $58,000 for other first year Registrars).

During the Basic and Advanced GP Terms Registrars were employed by teaching practices. The RACGP Training Program provided guidelines to practices and Registrars, who negotiated terms and conditions of employment on an individual basis. These guidelines, which were State-based set out what were effectively minimum rates of pay for GPs in their Basic and Advanced Terms. The rates of pay were based on the number of years experience post graduation (PGY2, PGY3 and so on). Consistent with the method used for first year GP Registrars, a weighted average of the rates according to the progression described in the standardised career model for each State was calculated. The weighted average of these salaries (using the number of GP registrars in each State as the weights) was then calculated to produce a representative national figure. This calculation resulted in a minimum representative salary of $55,500 for the second RACGP Training Program year (Basic and Advanced Terms) compared to $61,500 for other second year Registrars.

For subsequent GP time (the third RACGP Training Program year), Registrars negotiated their own terms and conditions of employment, and there were no applicable guidelines. It was reasonable to assume that the representative number for the third program year would be higher than the second year (an assumption supported by the RACGP). The percentage increase applicable to the second Training Program year between the Basic and Advanced term was considered as a marker. Using that figure, an increase in salary of around 10% between years two and three was considered to be representative of what might be expected. By applying the approximately 10% level, a representative salary for the third RACGP Training Program year (Subsequent Terms) of $63,000 (compared to $65,500 for other third year Registrars) was derived for use in the index numbers model.

- ***Post-fellowship training income***

This area was more difficult to standardise because of the wide range of activities that Fellows engaged in prior to entering independent practice. Examples included a continuation of training to complete postgraduate diplomas (where registrar level salaries would be appropriate), completing higher degrees by research (where research fellows salaries would be appropriate), pursuing an overseas posting (salary level depended on country and posting),

taking up another salaried position while continuing training (salary depended on position). There were no data available that measured the proportions of doctors pursuing these options.

As with pre-fellowship income, it was necessary to divide the analysis into two parts, GPs and specialists. For GPs, advice from the RACGP suggested that GPs undertaking post-fellowship training (eg Graduate Diploma in Rural Medicine) were likely to earn more than GP Registrars. No specific data were available on the level of earnings, as the terms and conditions under which qualified GPs worked in teaching practices were set by negotiation. As an estimate, an approximate 10% increase was applied to the representative salary calculated for the Subsequent Training Program Year. This calculation resulted in representative post-fellowship earnings of $70,000 per annum for GPs.

For specialists, a number of data sources were investigated, with a particular focus on salaries applicable to Fellows undertaking research towards higher degrees. From these investigations it was concluded that the appropriate range for the representative post-fellowship income for specialists was between $55,000 and $78,500. No detailed data were available, but in determining a representative income figure the $55,000 was considered to be too low (it related to less than 10% of the doctors), and the $78,500 was considered to be too high (as the analysis identified groups of doctors that had lower post-fellowship incomes). In the circumstances, it was determined that a reasonable representative post-fellowship income for specialists was $65,000. This figure compares to the standardised figure for GPs of $70,000.

4.4.3 Pre-independent practice education costs

Only direct course fees (enrollment fees, annual fees and examination costs) were counted as education costs (note Higher Education Contribution Scheme (HECS) costs were modeled separate to direct education costs, see below). Other education related expenditure such as relocation costs associated with pursuing placements in other than the trainees city of residence or pursuing overseas experience post-fellowship were not included. These costs were much more subjective (as they largely depended on choices that trainees made). The proportion of doctors in each category that pursued such opportunities was also unknown. Equally, there was little evidence that these (at least partly) discretionary costs were significantly different across the medical categories, hence their exclusion. Using these assumptions the direct education costs for all medical categories are presented in Table 33.

Table 33: Summary education expenses for each medical category

Specialty	Pre-Fellowship Training Total	Fellowship Training Total	Post-Fellowship Training Total	Total
Anaesthetics	$4,700	$6,525	$3,000	$14,225
Cardiothoracic	$9,745	$11,275	$2,200	$23,220
Colorectal Surgery	$9,745	$8,625	$2,200	$20,570
Dermatology	$0	$4,230	$0	$4,230
ENT	$9,745	$8,625	$2,200	$20,570
Emergency Medicine	$1,010	$5,030	$2,370	$8,410
General Surgery	$9,745	$8,625	$2,200	$20,570
GPs	$0	$2,865	$1,490	$4,355
Neurosurgery	$9,745	$9,950	$2,200	$21,895
Obstetrics/Gynaecology	$0	$6,575	$2,505	$9,080
Ophthalmology	$5,160	$10,150	$2,800	$18,110
Orthopaedics	$9,745	$8,625	$2,200	$20,570
Paediatric Surgery	$9,745	$9,950	$2,200	$21,895
Physicians	$0	$5,480	$1,280	$6,760
Plastic Surgery	$9,745	$9,950	$2,200	$21,895
Psychiatry	$0	$1,900	$0	$1,900
Radiation Oncology	$0	$4,125	$1,900	$6,025
Rehab Physician	$0	$7,950	$2,120	$10,070
Urology	$9,745	$9,950	$2,200	$21,895
Vascular Surgery	$9,745	$11,275	$2,200	$23,220

Review of the data highlights significant differences in the training costs of the various programs from a low of $1,900 (psychiatrists) to a high of $23,220 (cardiothoracic and vascular surgeons). In the index numbers model, the direct education and training costs were then subtracted from the income received in each phase of the medical career to produce adjusted income for each medical category as shown in Table 34 for anaesthetists.

Table 34: Adjusted income by career stage for anaesthetists

Career stage	Income	Education costs	Adjusted Income
Undergraduate	$7,000		$7,000
Pre-fellowship			
- year 1	$39,500		$39,500
- year 2	$44,000	$1,875	$42,125
- year 3	$48,000	$2,825	$45,175
- year 4	$55,000	$2,825	$52,175
Fellowship			
- year 1	$58,000	$925	$57,075
- year 2	$61,500	$925	$60,575
- year 3	$65,500	$2,825	$62,675
- year 4	$68,000	$925	$67,075
Post-fellowship			
- year 1	$65,000	$2,000	$63,000
- year 2	$65,000	$1,000	$62,000

The adjusted income was different at each stage of the career for the medical categories because the education costs varied across the programs. The index numbers model made calculations similar to those for anaesthetists for all the other categories of doctor.

4.4.4 Input standardised career models

As previously indicated the key input into the calculation of index numbers was the twenty standardised career models (one for each category of doctor). Table 35 shows, for example, the type of data that were drawn from the standardised career model for the medical categories into the index number model calculations.

Table 35: Example pre-independent practice career model for a medical category

Stage of career	Age Cohorts											
	18	…	22	23	24	25	...	30	…	38	39	40[#]
Career stage												
- undergraduate	100 %	100 %	100 %	80%	50%	20%						
- pre-fellowship				20%	50%	80%						
- fellowship training								80%				
- post-fellowship								20%		10%	5%	
- independent practice										90%	95%	100 %
Total	100 %	100 %	100 %	100 %	100 %	100 %		100 %		100 %	100 %	100 %

[#] age 40 is chosen for illustrative purposes only

4.4.5 Calculate pre-independent practice income

The data in Tables 31 and 34 provided the information required to calculate the expected value of the pre-independent practice income at each age. For example, using the example medical category, the expected income at age twenty-three was:

$$0.8x\$7,000 + 0.2x\$40,000 = \$13,600$$

The only other influence on income in the standardised career models was the need for doctors to pay HECS fees relating to undergraduate training. As a standardising assumption, HECS fees were modeled on a six-year medical undergraduate program (the actual undergraduate time varied between five and eight years), and resulted in a total repayment of $34,632 ($4,947 per year). The index numbers model assumed that the fees were repaid progressively in equal installments from age twenty-four through to age thirty, a period of seven years. This was a simplifying assumption that ensured that HECS repayment timing differences do not create any significant variation in the index numbers across the medical categories. There was no evidence to support using a different pattern of HECS payments across the medical categories (earnings of doctors in their training years were very similar). Using these assumptions, Table 36 illustrates the process for calculating the expected net income for each medical category for non-GPs (the process for GPs was identical but as previously indicated the income assumptions varied slightly).

Table 36: Illustrative pre-independent practice earnings for medical categories (non-GP)

Earnings Group	Age Cohorts											
	18	…	22	23	24	25	...	30	…	38	39	40[#]
Expected income ('000's)	$7	$7	$7	$13.6	$23.9	$37.1		$70.0		$6	$3	$0
HECS repayment ('000's)	$0	$0	$0	$0	$4.9	$4.9	$4.9	$4.9	$0	$0	$0	$0
Expected net income ('000's)	$7	$7	$7	$13.6	$19.0	$32.2		$65.1		$6	$3	$0

[#] age 40 is chosen for illustrative purposes only

For each category of doctor (n), the present value of pre-independent practice income could be calculated as:

$$Ipre_n = NPV \text{ (expected net income at each age)}$$

The major assumption in this calculation is the discount rate for the NPV. The discount rate reflects a time preference for money (ie a dollar amount in hand is worth more than the promise of having the same dollar amount at some future time). It is not an adjustment for inflation as the model is in constant dollar terms. It reflects that fact money in hand can be invested to produce a return, whereas money received at some future point cannot be invested until that time. After taking actuarial advice, it was agreed that a discount rate of 4.8% should be used in the index numbers model. This figure was based on the prevailing (as at the reference date) indexed bond rate (inflation adjusted) with an adjustment for the risk of death and disability.

4.4.6 Input career earnings for GPs (I_{gp})

As per the RRS methodology, the only group for which it was intended to calculate the actual independent practice income was GPs (the reference group). However, the Board did not reach agreement on I_{gp} (the NPV of the whole of career income for a GP providing an average mix of services) and E_{gp} (the remuneration reference rate for GPs). Accordingly, **to allow the index numbers model to be presented an illustrative value of $70 per hour was used for E_{gp} in the 'base model" (again, there is no attempt to pre-empt the result of any decision that might be made on the remuneration reference rate)**. Also for illustrative purposes, a sensitivity analysis using values of E_{gp} ranging from $65 to $75 per hour is presented.

4.4.7 Input CME time

The Board set the standardised number of hours available for fee earning at forty per week for forty-six weeks per year (1840 hours). The best method for modelling the effect of any CME time differentials in the index numbers model was to amend the standard hours available for fee earning. Four options were developed for modelling CME time and the Board decided that a decision on which option to use would be made outside of the RRS. **Again for illustrative purposes only this report adopts the two-band option (GPs 120 hours, all other medical categories 200 hours) in the 'base model'**. The effects of using any of the other CME time modelling options are examined in the sensitivity analysis (see section 4.5.2).

4.4.8 Calculation of E_p for other medical categories

For the other categories of doctor, there was no calculation of annual earnings but an adjustment of E_{gp} to produce the E_p (for each of the other medical groups). The number that multiplies into E_{gp} to give E_p for a medical category has been referred to as an index number in this report. The process of making the final calculation commenced by drawing from the independent practice component of the standardised career models. The data required are illustrated in Table 37.

Table 37: Example independent practice career models for a medical category

Stage of career	Age Cohorts (proportion of doctors)											
	35#	36	37	38	39	…	...	60	61	62	63	64
Career stage												
- pre-independent practice	30%	20%	15%	10%	5%							
- independent practice	70%	80%	85%	90%	95%			90%	90%	90%	90%	90%
- retirement								10%	10%	10%	10%	10%
Total												

age 35 is chosen for illustrative purposes only

By combining the data in Table 37 with the standardised 1840 hours per year figure (adjusted for CME time input), it was possible to calculate the total hours available for fee earning over the course of a career. For example using the two-band option for CME and the illustrative career model data the standardised hours available for a non-GP at age sixty-one will be:

$$0.9x\ (1840+120-200) + 0.1x0 = 1584$$

The data derived from this process is shown in Table 38 (again the figures are for illustrative purposes only).

Table 38: Independent practice career models for medical categories

Medical Category	Age Cohorts (annual hours)											
	35#	36	37	38	39	…	...	60	61	62	63	64
GPs	1840	1840	1840	1840	1840			1656	1656	1656	1656	1656
Medical category (n)	1232	1408	1496	1584	1672			1584	1584	1584	1584	1584

age 35 is chosen for illustrative purposes only

These data illustrate the difference between the income producing hours available to a GP and the income producing hours available to a doctor in medical category (n) for each career year. The final step was to equalise the NPV of the whole of career earnings for GPs and medical category (n). The idea was to calculate E_n so those doctors in medical category (n) have the opportunity to earn the same as GPs. The formula is derived from:

$$I_{gp} = Ipre_n + Iind_n$$

As the NPV for independent practice was a function of the available hours multiplied by the constant hourly rate (E_n), the formula can be re-arranged to calculate the only unknown (E_n).

This approach increments E_{gp} to produce E_n. (in theory E_n could be below E_{gp} but this situation did not occur in practice as GPs had the shortest training time). Put another way, the hourly rate for medical category (n) was calculated so as to ensure that any income lost (either through lower training income or lower available practice hours) by a decision to pursue training rather than independent practice can be regained over the course of a career through a higher hourly rate.

4.5 ILLUSTRATIVE INDEX NUMBERS

In this section, the results obtained by using the index numbers model are presented. The base model is presented first. Using sensitivity analysis the impact of varying the assumptions in the base model relating to the areas where the Board did not reach a final decision (the remuneration reference rate and CME time) is presented.

4.5.1 Base model

The base model used E_{gp} of $70 per hour, a 4.8% discount rate, 120 GP CME hours per year, and standardised pre-independent practice income (although different for GPs and specialists). The results of using these assumptions are set out in Table 39, in terms of dollars per hour and index numbers.

Table 39: Illustrative results for 'base' index numbers model

Medical Category	Index Number	Dollar Value
Anaesthetists	1.18	$82.31
Cardiothoracic Surgeons	1.30	$91.03
Colorectal Surgeons	1.18	$82.77
Dermatologists	1.16	$81.46
ENT Surgeons	1.18	$82.83
Emergency Physicians	1.18	$82.54
General Surgeons	1.18	$82.77
General Practitioners	1.00	$70.00
Neurosurgeons	1.26	$88.54
Obstetricians & Gynaecologists	1.17	$81.85
Ophthalmologists	1.21	$84.41
Orthopaedic Surgeons	1.20	$84.19
Paediatric Surgeons	1.26	$88.55
Physicians	1.23	$86.30
Plastic Surgeons	1.29	$90.55
Psychiatrists	1.18	$82.43
Radiation Oncologists	1.18	$82.49
Rehabilitation Physicians	1.17	$81.92
Urologists	1.22	$85.09
Vascular Surgeons	1.31	$91.37

Review of the data shows a variation range, purely in terms of intellectual capital factors of 31% (1.00 for GPs to 1.31 for vascular surgeons). Given the relative closeness of the index

numbers, there was the possibility of further grouping the medical categories. For example with surgeons, there appeared to be a group at around 18% higher than GPs (eg general surgeons, ENT surgeons, colorectal surgeons) another group around 26% higher than GPs (paediatric surgeons, neurosurgeons) and a final group around 30% higher than GPs (vascular surgeons, cardiothoracic surgeons). As necessary, this type of analysis could be carried out once the assumptions underlying the index numbers model are finalised.

4.5.2 Variations in the remuneration reference rate

The remuneration reference rate for GPs (E_{gp}) was a key input into this analysis. Table 40 illustrates how the index numbers vary as E_{gp} moves through the range \$65 to \$75 per hour. The base model used a rate of \$70 per hour.

Table 40: Index number variations with Egp

Medical Category	GP Reference Rate				
	\$65	**\$67.50**	**Base Model \$70.00**	**\$72.50**	**\$75**
Anaesthetists	1.17	1.17	1.18	1.18	1.18
Cardiothoracic Surgeons	1.28	1.29	1.30	1.31	1.32
Colorectal Surgeons	1.17	1.18	1.18	1.19	1.19
Dermatologists	1.15	1.16	1.16	1.17	1.17
ENT Surgeons	1.17	1.18	1.18	1.19	1.19
Emergency Physicians	1.17	1.17	1.18	1.18	1.19
General Surgeons	1.17	1.18	1.18	1.19	1.19
General Practitioners	1.00	1.00	1.00	1.00	1.00
Neurosurgeons	1.25	1.26	1.26	1.27	1.28
Obstetricians & Gynaecologists	1.16	1.16	1.17	1.17	1.18
Ophthalmologists	1.19	1.20	1.21	1.22	1.22
Orthopaedic Surgeons	1.19	1.20	1.20	1.21	1.21
Paediatric Surgeons	1.25	1.26	1.26	1.27	1.28
Physicians	1.22	1.22	1.23	1.24	1.25
Plastic Surgeons	1.28	1.29	1.29	1.30	1.31
Psychiatrists	1.17	1.17	1.18	1.18	1.19
Radiation Oncologists	1.17	1.17	1.18	1.18	1.18
Rehabilitation Physicians	1.16	1.16	1.17	1.18	1.18
Urologists	1.20	1.21	1.22	1.22	1.23
Vascular Surgeons	1.29	1.30	1.31	1.31	1.32

Analysis of the data demonstrates that the range of percentage loadings narrowed as E_{gp} reduced and expanded as E_{gp} increased. This trend was consistent with expectations as increasing the remuneration reference rate had the effect of increasing the differential between GPs independent practice income and specialists training income. Because of their later entry into independent practice, specialists would then have to earn at a higher rate to achieve the same lifetime income as GPs.

4.5.3 Variations in CME time

The base model assumed CME time input of 120 hours for GPs and 200 hours for specialists. For the sensitivity analysis, the effects of using the one-band, three-band and four-band CME time input modelling options (see Table 22 for the classification of medical categories into bands) have been illustrated in Table 41. To assist with the interpretation of the data, the number and proportion of doctors in each category as drawn from the Medicare database in 1998/99 has been included in the table.

Table 41: Index number variations with CME time input option for the base model

Medical Category	Number of Doctors(1)	Proportion of total	CME time option (number of bands)			
			One	Two	Three	Four
Anaesthetists	2,022	6.5%	1.12	1.18	1.16	1.18
Cardiothoracic Surgeons	101	0.3%	1.24	1.30	1.28	1.28
Colorectal Surgeons(2)	81	0.3%	1.13	1.18	1.16	1.16
Dermatologists	298	1.0%	1.11	1.16	1.14	1.14
ENT Surgeons	329	1.1%	1.13	1.18	1.16	1.16
Emergency Physicians	91	0.3%	1.13	1.18	1.16	1.16
General Surgeons(2)	1,100	3.5%	1.13	1.18	1.16	1.16
General Practitioners	17,836	57.4%	1.00	1.00	1.00	1.00
Neurosurgeons	104	0.3%	1.21	1.26	1.24	1.24
Obstetricians & Gynaecologists	907	2.9%	1.12	1.17	1.15	1.15
Ophthalmologists	708	2.3%	1.15	1.21	1.23	1.23
Orthopaedic Surgeons	659	2.1%	1.15	1.20	1.18	1.18
Paediatric Surgeons	47	0.2%	1.21	1.26	1.24	1.24
Physicians	4,212	13.6%	1.18	1.23	1.25	1.25
Plastic Surgeons	223	0.7%	1.24	1.29	1.27	1.27
Psychiatrists	1,735	5.6%	1.13	1.18	1.16	1.18
Radiation Oncologists	146	0.5%	1.13	1.18	1.16	1.16
Rehabilitation Physicians	122	0.4%	1.12	1.17	1.15	1.15
Urologists	223	0.7%	1.16	1.22	1.20	1.20
Vascular Surgeons	111	0.4%	1.25	1.31	1.28	1.28
Total number of doctors	31,055	100%				

(1) Source Medicare database 1998/99

(2) General Surgeons numbers reduced by 81 Colorectal Surgeons as advised by the Colorectal Surgical Society of Australia

Review of the data in Table 41 demonstrates that CME had a significant impact on the index numbers. As expected use of either the three or four band system reduced the range of the index numbers from 1.00 through to 1.31 for the two-band system down to from 1.00 to 1.28. The use of a single band (i.e. CME time was undifferentiated across all medical categories) produced the narrowest index numbers range from 1.00 to 1.25.

In term of relativities between the groups, as expected the categories most affected by the three band system are physicians and ophthalmologists (increased in index numbers by 0.02 while the other categories index numbers typically reduced by 0.02 relative to the two-band system). In the four-band system psychiatrists and anaesthetists maintained their index numbers, physicians and ophthalmologists increased their index numbers by 0.02 while the other categories index numbers typically reduced by 0.02 relative to the two-band system.

APPENDIX A

MEMBERS OF THE BOARD, TASKFORCE AND PROJECT TEAM

Medicare Schedule Review Board

Role	Person	Representing
Board Chairperson	Dr Louise Morauta	Department of Health and Aged Care
Board Members	Dr Stephen Clarke	Australian Medical Association
	Mr Ian McRae	Department of Health and Aged Care
	Dr Geoffrey Metz	Australian Medical Association
	Dr Col Owen	Australian Medical Association
	Mr Terry Slater	Department of Health and Aged Care

Medicare Schedule Review Taskforce

Role	Person	Representing
Director	Mr Col Bailey (till Jun '99)	Department of Health and Aged Care
Director	Mr John Popplewell	Australian Medical Association
Director	Mr Allan Rennie (from Jul '99)	Department of Health and Aged Care
Assistant Director	Mr David Reddy	Department of Health and Aged Care

Remuneration Rates Study Project Team

Role	Person	Firm
Project Director	Mr Joe Scuteri	Healthcare Management Advisors
Project Consultants	Mr Paul Zadow	Healthcare Management Advisors
	Ms Lynn Phelan	Healthcare Management Advisors
	Ms Krystyna Parrott	Healthcare Management Advisors
	Ms Sue Bailey (Admin)	Healthcare Management Advisors
	Ms Jackie Lukehurst (Admin)	Healthcare Management Advisors
Medical Advisor	Dr Chris Scarf	Scarf Associates
Remuneration Consultants	Mr Hugh Bucknall	Mercer Cullen Egan Dell
	Mr Hugh Seccombe	Mercer Cullen Egan Dell
	Mr David Leihy	Mercer Cullen Egan Dell
	Mr Chris Carbert	Mercer Cullen Egan Dell
	Mr Andrew Kinder	Mercer Cullen Egan Dell
	Mr Ross McLelland	Mercer Cullen Egan Dell
	Mr Tim Nice	Mercer Cullen Egan Dell
	Ms Belinda Barnett	Mercer Cullen Egan Dell
	Mr Matt Phillips	Mercer Cullen Egan Dell
	Ms Emma Grogan	Mercer Cullen Egan Dell
Actuarial Consultants	Mr Peter Carroll	Carroll Humphreys Ransom
	Mr Eric Ransom	Carroll Humphreys Ransom
Statistical Consultants	Professor Richard Jarrett	The University of Adelaide
	A/Professor Peter Taylor	AdStat Solutions
	Dr Nigel Bean	AdStat Solutions

APPENDIX B

GENERAL FORMULA FOR COSTING MEDICAL FEES

Fee = [Professional Component] + [Practice Cost Component]

$$\mathbf{F = [RVUs_s \times E_p] + [DC_s + OR_{p/s} + PI_{p/s} + WC_p]}$$

$RVUs_s$ = Relative Value Units assigned to each item of service. RVUs are a function of total professional time T_{1s} and T_{2s} and relative service intensity or effort (I_s). Intensity of a service (I_s) is a function of relative complexity (C_s) and risk or "sweat" (S_s).

T_{1s} = Average efficient direct (face to face) service time by doctor.

T_{2s} = Average efficient indirect (non face to face) service time by doctor.

C_s = Relative complexity factor for that service.

S_s = Relative risk or "sweat" factor for that service.

E_p = Standard or base earning rate per RVU for that specialty or class of practitioner taking into account the human capital investment, including training, duration of professional working life etc. that is relevant to that specialty or class.

DC_s = Direct costs such as direct staff (technicians etc.), consumables, dedicated facilities etc. attributable to that service and based on reasonably efficient practice.

$OR_{p/s}$ = General overhead recovery attributable to that specialty -based on the financial modelling of reasonably efficient practice.

$PI_{p/s}$ = Professional indemnity recovery attributable to that specialty.

WC_p = Allowance for working capital based on representative cost/ billing/ payment cycle and levels of debtors and creditors.

NOTES

(1) The above formula does not address "qualitative" (and largely subjective) factors such as the most cost effective process, or measurements of the relative worth of services, their social benefits etc.

(2) Allowances for "profit", return on capital investment etc.are assumed to be built into relevant cost components.

(3) The formula assumes that proper differentiation of services occurs so that globalisation is kept to a minimum.

(4) "Cost neutrality" and changes in the growth or mix of services are not considered to be relevant to the individual fee setting process and are therefore not part of the formula.

(5) In developing the professional component, complexity and risk loadings are not applied linearly to total time ($T_{1s} + T_{2s}$) but lie in varying relationships to direct time (T_{1s}) depending on the nature of the service. The functional relationship between time and intensity is determined from the ranking and rating process.

(6) The recovery of general practice overheads ($OR_{p/s}$) and professional indemnity costs ($PI_{p/s}$) in fees should not be dismissed lightly as being simple percentage mark-ups on the professional component. There are complex costing issues (such as possible differentials between services provided in and out of rooms) that must be addressed otherwise distortions in fee relativities may result.

(7) It is critical that all variables are accurately identified in order that any future changes or indexation are properly applied to ensure that the relativities between fees for items remain reliable.

APPENDIX C

MATHEMATICAL REPRESENTATION OF THE MODEL FOR CALCULATING THE REMUNERATION REFERENCE RATE

STEPS IN CALCULATING THE REMUNERATION REFERENCE RATE

The steps for calculating the remuneration reference rate for General Practitioners using the standardised career model for other professional career groups (accountants is used as the working example) are set out below.

1. Develop standardised career models for all other professions (Accountants, Chemists, Chemists/Geologists, Engineers, Geologists and Lawyers).

2. Work out number of hours per year, the Continuing Education (CE) time for each profession and the salary for each year of non-independent practice in the models. The work value points for each profession from Mercer Cullen Egan Dell are used to calculate the remuneration of independent practice.

3. Calculate the salary for Accountants for each year in independent practice, using the appropriate MCED pay lines. Salary at age i is calculated using the following steps:

$$WVP_{Age_i} = \alpha Age_i^2 + \beta Age_i + \gamma$$

$$Salary_{Age_i} = \delta WVP_{Age_i} + \varepsilon$$

where:

WVP_{Age_i} = work value points for accountants at age i;

α, β & γ = the values determined by the fitting of the quadratic curve to the WVP study results;

δ & ε = the values given by MCED as the equation for the median pay line for accountants.

Pay lines are available for the 25th, 50th and 75th percentile. Other remuneration values (eg the 60th percentile) are estimated by interpolation.

4. Calculate the weighted salary for accountants for each age from 18 to 64 (ie. 47 years) using the career paths in the GPs standardised career model.

Career Stage	Salary	Age_1		Age_i		Age_{47}
1	x_1	y_{11}		y_{i1}		$y_{47\,1}$
2	x_2	y_{12}		y_{i2}		$y_{47\,2}$
3	x_3	y_{12}	…	y_{i3}	…	$y_{47\,3}$
…	…	…		…		…
…	…	…		…		…
…	…	…		…		…
N	X_N	y_{1N}		y_{iN}		$y_{47\,N}$

$$remuneration_{Age_i} = \sum_{j=1}^{N}(x_j y_{ij}) - HECS_{Age_i}$$
$$= (x_1 y_{i1}) + (x_2 y_{i2}) + (x_3 y_{i3}) + \ldots + (x_N y_{iN}) - HECS_{Age_i}$$

where:

y_{ij}	=	proportion of GPs in career stage j for age group i
x_j	=	adjusted earnings for career stage j where adjusted earnings are defined by salaried earnings minus direct education costs
$HECS_{Age_i}$	=	standardised amount of HECS paid by an accountant at age i

and:

$$\sum_{j=1}^{N} y_{ij} = 1 \quad \text{for } i = 1 \text{ to } 47$$

5. Calculate the NPV for Accountants

$$NPV_{Acc} = \sum_{i=1}^{47} remuneration_{Age_i} * (1 + DiscountRate)^{-i}$$
$$= \sum_{i=1}^{47} (\sum_{j=1}^{N} (x_i y_{ij}) - HECS_{Age_i}) * (1 + DiscountRate)^{-i}$$

where the Discount Rate is variable and input as an assumption.

6. Now we use the NPV_{Acc} to help calculate the Remuneration Reference Rate for General Practitioners.

We now use the assumption that

$$NPV_{GP} = NPV_{Acc}$$

to work out what E_{GP} needs to be.

7. Calculate the weighted remuneration for each age but exclude the remuneration from independent practice. Call this value X.

$$X = \sum_{i=1}^{47} (\sum_{j=1}^{N-1} (x_i y_{ij}) - HECS_{Age_i}) * (1 + DiscountRate)^{-i}$$

Now use X to help calculate E_{GP}

$$NPV_{GP} = X + \sum_{i=1}^{47} ((HoursPerYear + (CE_{Acc} - CE_{GP})) * E_{GP}) * y_{iN} * (1 + DiscountRate)^{-i}$$

and we will define the variable Z as

$$Z = (HoursPerYear + (CE_{Acc} - CE_{GP}))\sum_{i=1}^{47} y_{iN} * (1 + DiscountRate)^{-i}$$

[For every profession year N will always represent independent practice]

8. To calculate E_{GP} we use

$$E_{GP} = (NPV_{Acc} - X) / Z$$

$$= \frac{NPV_{Acc} - (\sum_{i=1}^{47}(\sum_{j=1}^{N-1}(x_j y_{ij}) - HECS_{Age_i}) * (1 + DiscountRate)^{-i}}{(HoursPerYear + (CE_{Acc} - CE_{GP}))\sum_{i=1}^{47} y_{iN} * (1 + DiscountRate)^{-i}}$$

9. This same method is applied to all other professions to produceE_{GP} that equates GP career earnings to the results of each standardised career model in turn.

APPENDIX D

MATHEMATICAL FORMULAE FOR INDEX NUMBERS MODEL

STEPS IN CALCULATING INDEX NUMBERS

1. Develop career models for all specialties of doctors.

2. Standardise the number of hours per year, the CME time, direct education costs for each specialty and the earnings for each year of non-independent practice in the models.

3. Determine the Remuneration Reference Rate for General Practitioners (E_{GP}) by completing the work on term of reference (b).

4. The earnings for GPs in independent practice is calculated using the following formula:

$$(HoursPerYear - CME_{GP}) * E_{GP}$$

5. Calculate the expected earnings for GPs for each age from 18 to 64 (ie a period of 47 years).

Career Stage	Earnings	Age_1		Age_i		Age_{47}
1	x_1	y_{11}		y_{i1}		$y_{47\,1}$
2	x_2	y_{12}		y_{i2}		$y_{47\,2}$
3	x_3	y_{12}	…	y_{i3}	…	$y_{47\,3}$
…	…	…		…		…
…	…	…		…		…
…	…	…		…		…
N	x_N	y_{1N}		y_{iN}		$y_{47\,N}$

$$remuneration_{Age_i} = \sum_{j=1}^{N} (x_j y_{ij}) - HECS_{Age_i}$$
$$= ((x_1 y_{i1}) + (x_2 y_{i2}) + (x_3 y_{i3}) + ... + (x_N y_{iN})) - HECS_{Age_i}$$

where:

y_{ij} = proportion of doctors in career stage j for age group i

x_j = adjusted earnings for career stage j where adjusted earnings are defined by salaried earnings minus direct education costs.

$HECS_{Age_i}$ = standardised amount of HECS paid by doctors at age i for i = 24 to 30

and:

$$\sum_{j=1}^{N} y_{ij} = 1 \text{ for } i = 1 \text{ to } 47$$

6. Calculate the NPV for General Practitioners

$$NPV_{GP} = \sum_{i=1}^{47} remuneration_{Age_i} * (1 + DiscountRate)^{-i}$$
$$= \sum_{i=1}^{47} (\sum_{j=1}^{N} (x_i y_{ij}) - HECS_{Age_i}) * (1 + DiscountRate)^{-i}$$

where the discount rate is variable and input as an assumption.

7. Now we use the NPV_{GP} to help calculate the Remuneration Reference Rate for all other specialties. (For illustration we will use Dermatologists).

We now use the assumption that:

$$NPV_{DERM} = NPV_{GP}$$

to work out what E_{DERM} needs to be.

8. Calculate the weighted remuneration for each age but exclude the remuneration from independent practice. Call this value X.

$$X = \sum_{i=1}^{47} (\sum_{j=1}^{N-1} (x_i y_{ij}) - HECS_{Age_i}) * (1 + DiscountRate)^{-i}$$

Now use X to help calculate E_{DERM}

$$NPV_{GP} = X + \sum_{i=1}^{47} ((HoursPerYear - CME_{DERM}) * E_{DERM}) * y_{iN} * (1 + DiscountRate)^{-i}$$

and we will define the variable Z as

$$Z = (HoursPerYear - CME_{DERM}) \sum_{i=1}^{47} y_{iN} * (1 + DiscountRate)^{-i}$$

[For every specialty year N will always represent independent practice]

9. To calculate E_{DERM} we use

$$E_{DERM} = (NPV_{GP} - X) / Z$$
$$= \frac{NPV_{GP} - \sum_{i=1}^{47} (\sum_{j=1}^{N-1} (x_j y_{ij}) - HECS_{Age_i}) * (1 + DiscountRate)^{-i}}{(HoursPerYear - CME_{DERM}) * \sum_{i=1}^{47} y_{iN} * (1 + DiscountRate)^{-i}}$$

10. This same method is applied to all other specialties to produce their rates.

11. For Dermatologists their index is now

$$INDEX_{DERM} = E_{DERM} / E_{GP}$$

Again this is done for all other specialties to produce a list of indices.

APPENDIX E

LIST OF RESOURCE MATERIALS

LIST OF RESOURCE MATERIALS

TERM OF REFERENCE (A)

REPORT ON THE SELECTION OF THE REFERENCE CATEGORY OF DOCTOR

TERM OF REFERENCE (B)

METHODOLOGY FOR TERM OF REFERENCE (B)

REPORT ON THE SELECTION OF THE OTHER PROFESSIONAL GROUPS

REPORT ON THE GENERAL PRACTICE WORK VALUE POINTS STUDY

REPORT ON THE PUBLIC SECTOR DOCTORS REMUNERATION SURVEY

REPORT ON THE OVERSEAS DOCTORS REMUNERATION SURVEY

REPORT ON THE ANALYSIS OF THE SUPER-ADDED FACTORS

REPORT ON POTENTIAL BIAS IN THE MCED PAY-LINES DATA

REPORT ON THE INDUSTRY AND MARKET FACTORS IMPACTING ON USE OF WORK VALUE POINTS

REPORT ON CALCULATING THE REMUNERATION REFERENCE RATE

TERM OF REFERENCE (D)

METHODOLOGY FOR CALCULATING INDEX NUMBERS FOR HUMAN CAPITAL FACTORS

REPORT OF THE CME SURVEY

REPORT ON REMUNERATION FOR RISKS ASSOCIATED WITH INVESTMENTS IN TRAINING

REPORT ON POSSIBLE REVISIONS TO THE PHYSICIANS' CAREER MODEL

REPORT ON THE DEVELOPMENT OF STANDARDISED CAREER MODELS FOR EACH MEDICAL CATEGORY

REPORT ON THE STANDARDISED CAREER MODEL FOR ANAESTHETISTS

REPORT ON THE STANDARDISED CAREER MODEL FOR CARDIOTHORACIC SURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR COLORECTAL SURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR DERMATOLOGISTS

REPORT ON THE STANDARDISED CAREER MODEL FOR EMERGENCY PHYSICIANS

REPORT ON THE STANDARDISED CAREER MODEL FOR ENT SURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR GENERAL SURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR GENERAL PRACTITIONERS

REPORT ON THE STANDARDISED CAREER MODEL FOR NEUROSURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR OBSTETRICIANS AND GYNAECOLOGISTS

REPORT ON THE STANDARDISED CAREER MODEL FOR OPHTHALMOLOGISTS

REPORT ON THE STANDARDISED CAREER MODEL FOR ORTHOPAEDIC SURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR PAEDIATRIC SURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR PHYSICIANS

REPORT ON THE STANDARDISED CAREER MODEL FOR PLASTIC SURGEONS

REPORT ON THE STANDARDISED CAREER MODEL FOR PSYCHIATRISTS

REPORT ON THE STANDARDISED CAREER MODEL FOR RADIATION ONCOLOGISTS

REPORT ON THE STANDARDISED CAREER MODEL FOR REHABILITATION PHYSICIANS

REPORT ON THE STANDARDISED CAREER MODEL FOR UROLOGISTS

REPORT ON THE STANDARDISED CAREER MODEL FOR VASCULAR SURGEONS

REPORT ON CALCULATING INDEX NUMBERS FOR HUMAN CAPITAL FACTORS