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**ATTRACTING HEALTH PROFESSIONALS INTO
PRIMARY CARE: STRATEGIES FOR RECRUITMENT**

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INTRODUCTION

Workforce projections from many of the developed countries of the world suggest an absolute fall in the number of full-time equivalent general practitioners/family physicians over the next decade unless more doctors choose general practice/family medicine as a career. Australia is already suffering from a shortage of GPs and the crisis in manpower is even more pronounced in rural and remote areas. Moreover it is not only doctors who are turning their backs on community, rural and remote positions but also other healthcare professionals including nurses. There have been many suggestions made as to the cause of this shift in popularity of general practice as a career; often the reasons cited are based on anecdote, intuition and/or personal experience. Other health professionals are also greatly needed in rural areas and factors affecting their recruitment are also important to research and understand.

This paper aims to:

- Explore the factors that affect career and practice location choice of medical students, junior doctors and other health professional students
- Make policy options to ease the GP/primary care/rural workforce crisis taking into account these factors

In particular we will investigate how the following may impinge on career choice

- Changes in medical school curricula and clinical placements
- Increases in the numbers of medical students
- Rural clinical school and rural practice placements
- Exposure to general practice at the prevocational level (postgraduate years 1 and 2)
- The evolution of interprofessional/multidisciplinary education and practice

This investigation is conducted mainly through a review of the relevant literature but is also informed by interviews and communication with stakeholders

Through analysis of the factors we can identify those that may be manipulated in order to increase the numbers of health professionals choosing careers in general practice and rural areas. The findings will be the basis of recommendations to help ensure that the current workforce crisis is ameliorated during the next ten years.

OUTLINE

The evidence for the workforce projections and definitions of terms are outlined. This is followed by the four research questions posed and a description of the research methodology. The results are presented firstly with reference to previously published literature reviews on these topics, then the Australian papers are synthesized, thirdly the research questions are addressed with reference to international publications. Following published data we discuss the interviews and consultations with stakeholders. Then the factors affecting career choice that may be manipulated are listed. Finally we present implications and policy options.

Because many developed countries are facing the same problems with recruitment we decided to look at what is happening in health services other than Australia, and compare this to the Australian situation. While health services differ in modes of delivery and funding there are many similarities related to training, workforce needs and pressure on services. By exploring the problem, actual and potential solutions, and research data in other countries, we are able to gain a much richer picture about career choice factors and consider their generalisability to Australia. Therefore we will present findings from the USA, Canada, the UK, New Zealand as well as some other European countries.

DEFINITIONS

When considering workforce issues we need to be clear about the definitions of the career choices being made, though these are not without controversy. In Australia the Royal Australian College of General Practitioners defines general practice as 'the provision of primary continuing comprehensive whole-patient medical care to individuals, families and their communities'¹. A general practitioner (GP) is usually the first healthcare professional with whom a patient makes contact. This is also the case in the UK, where every person is registered with a GP, whom they may also call their family doctor. In Canada the term is family physician and the discipline family medicine.

Primary care is often used interchangeably with general practice but technically includes provision by health professionals other than doctors. To make matters more confusing, in Australia primary care and primary health care are often seen as identical concepts. Primary health care has been defined as 'socially appropriate, universally accessible, scientifically sound first level care provided by a suitably trained workforce supported by integrated referral systems and in a way that gives priority to those most in need, maximises community and individual self-reliance and participation and involves collaboration with other sectors'². In the USA primary care encompasses healthcare provided in community settings, outside the hospitals but includes discipline-specific doctors such as primary care paediatricians and internal physicians as well as family physicians. America also uses the term 'generalist' to distinguish from the 'specialist'. Therefore the American literature needs care in interpretation when considering career choice.

In medical training there is also variation in the length of medical school programs and timing of career choice. Australian and British medical schools offer either a five/six year undergraduate degree course with entry at 18 or older or a four year graduate entry course with entry following a first degree. In the USA all medical schools are graduate entry. Graduate entry students are therefore older and more mature. Australian and British doctors do not have to choose a final career pathway until after qualification, though many have made a decision before this time. A final choice may not be made until one to three years after gaining a medical degree. In the USA and Canada medical students choose their specialty training post while in the final two years of their four year graduate entry program. Therefore factors affecting career choice are in play earlier than in the other countries where prevocational placements may have some effects. However because USA medical students graduate straight into residency training programs, their initial career choices are easy to track and there is an abundance of data published each year through the National Residency Matching Program.

THE NATURE OF THE PROBLEM

In 2007 for the first time since the formation of Australian General Practice Training (AGPT) the target number of training places has been filled (600 places), a marked increase on the 2006 figures. There was a 7% increase in the number of applicants and an 11% increase in the number of acceptances³. Figures for 2008 are more worrying with a decrease in the number of applications for the first round of the 2008 general pathway intake, rural pathway applications being similar to 2007.⁴ However even if the absolute numbers of GPs may rise, the number of FTEs will undoubtedly fall if current trends continue. A computer simulation of workforce numbers suggests that the general practice shortage will continue until at least 2012⁵ when the recent increase in medical student numbers results in more graduates – however even these numbers may not resolve the problem. The possibility that the increasingly diverse nature of Australian medical schools will result in changes to workforce choices has been suggested, making prediction even more difficult⁶.

The feminisation of the general practice workforce is also a factor in workforce planning. Between 1991 and 2003 the percentage of women choosing a career in general practice rose from 19.3% to 35.2%⁷, many of whom will choose to work part-time.

In the UK between 1993 and 2005 the proportion of women working full-time in general practice fell from 73% to 53%⁸, while a 2002 survey of GP registrars in the Thames region found that only 30% of the women intended to work full-time.⁹ However male GPs are also choosing to spend less time in practice; the percentage of male GPs working fewer than six sessions per week almost doubled between 1999 and 2003 in Australia: from 6.1% to 11.4%.⁷ In the Thames survey only 75% of male GP registrars planned to work full-time.⁹ There is a continuing shortfall and increasing number of vacancies in the rural and remote workforce and this situation will not be resolved by the current number of newcomers to the GP workforce.¹⁰ Even in Sydney there appears to be a critical shortage of GPs with doctor-patient ratios worse in some parts of the city than in country towns.¹¹

Medical schools that follow their graduates' career paths also report a decline in the number choosing general practice. For example Monash University staff followed up four cohorts of students and found that while 50% of the students from 1980 and 1985 went into general practice, only 38% and 33% from 1990 and 1995 did so.¹² The percentage dropped even further in the next decade. Australian Medical Workforce Advisory Committee (AMWAC) data from a survey carried out in 2002 show that on average 17.6 % of graduates were on GP vocational training programs – of interest is that this figure varies for the different medical schools: 27.1 % for the University of Western Australia (UWA), 19.9% Flinders (the two highest), University of New South Wales (UNSW) 12.2%, University of Sydney 13.8% (the two lowest) suggesting that an analysis of medical school programs and their admission policies may help in teasing out career choice factors.¹³

Data collected in the USA between 1994 and 2006 show that there has also been a steady decline in the number of students choosing family medicine residencies after a peak in 1997, possibly due in part to changes in reimbursement and medical curricula.¹⁴ Between 1999 and 2002 the percentage of US medical students choosing primary care declined from 35.6% to 21.5%.¹⁵ In 2006 only 41.5% of family medicine training positions were filled by US graduates (1132 out of a total of 2727). In 1996 this figure was 72.6%.¹⁶ Again there is a difference in medical school output: for example only 1% of Yale University students enter family medicine training while for Marshall Medical School in West Virginia the percentage is 27.5%.¹⁷

Canada has similar figures with a steady decline in choice from 40% of graduates in the early 1990s to less than 28% in 2001.¹⁸ This is worrying as the College of Family Physicians of Canada calculates that at least 50% of practising doctors need to be family doctors in order for Canada's health service to survive.¹⁹ The UK has similar problems²⁰ and future trends are likely to feature a continuing desire for flexible working patterns, a higher proportion of female GPs and a need for career breaks.²¹

These statistics are obviously of concern and have resulted in a flood of papers on career choice and trends in the last decade. There are several researchers who stand out in this field. However many of the papers retrieved give opinion rather than fact and many use the same sets of data to look at different issues. So while we started with a large number of references, the papers making conclusions based on quality research data were quite small in number.

METHOD

LITERATURE REVIEW SEARCH STRATEGY

The search terms were derived from four research questions. The searches were conducted in the order: i, iii, iv, ii. The full search methodology is given in Appendix 1.

Question i.

What is known about the factors that may attract or detract the new generation of doctors from a career in general practice?

How might the changing curricula offered by medical schools influence these factors?

What are the options for further changes that might be made to medical student learning experiences to make general practice more attractive as a career?

Question iii.

What is known about the effects of introducing interprofessional primary healthcare teams in terms of attracting health professionals to work in the community (doctors, nurses, other health professionals)?

Is the effect likely to be positive?

What influence does interprofessional education at pre-qualification level have on choosing a career in which interprofessional practice and collaboration is an increasing component of patient health care delivery?

Question iv.

What is known about the effects of rural clinical school experience on the career choices of health professionals?

Are rural attachments likely to increase the number of graduates wishing to work in rural areas?

How might the learning experience offered at rural clinical schools be enhanced to provide a positive motivation to health professionals to stay in rural and remote areas after qualification?

What are the effects of compulsory rural attachments on medical students in terms of motivation towards a career in rural general practice?

What are the effects on rural doctors who offer compulsory attachments to medical students who may not want to be there in terms of being role models?

What effects does a compulsory rural term have in terms of motivating GP registrars to work in rural areas after qualification?

Question ii.

What is known about the influence of GP placements at the pre and post qualification phases of medical education on choosing general practice as a career?

In what ways might increasing medical student numbers affect this influence? (Positively or negatively by affecting the quality of the GP learning experience?)

What effect does working in general practice in the PGPPP (prevocational general practice placements program) have on career choice?

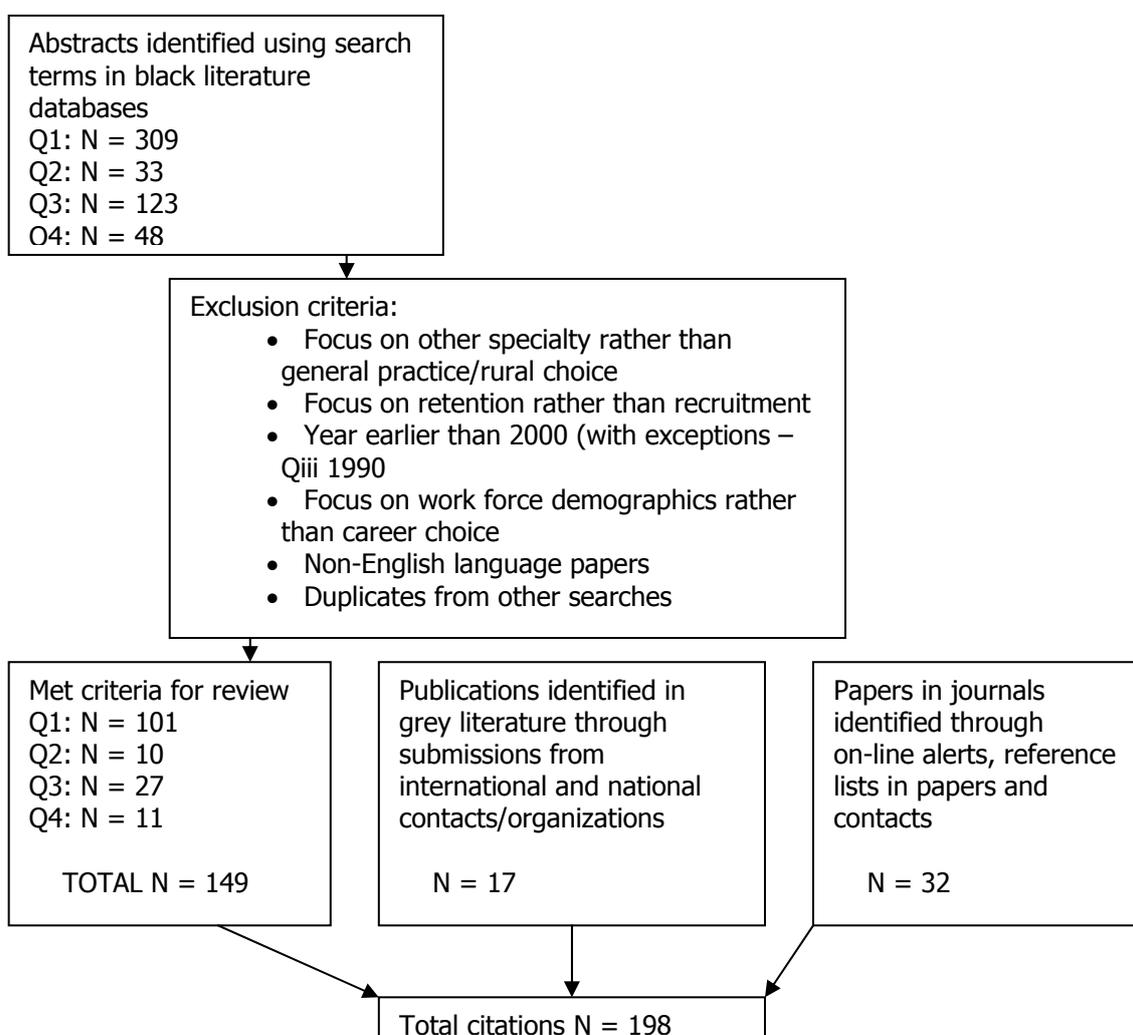
If there is a positive influence, how should this affect policy in regard to the desirability of all doctors spending time on this program?

How much would such an option cost?

Table 1: Characteristics of reviewed papers

Country	Number	Year	Number
Australia	57	2007	14
Canada	23 + 1 website	2006	27
New Zealand	6	2005	30
United Kingdom	28	2004	29
USA	74	2003	29
Other	9	2002	19
		2001	14
		2000	10
		1990s	25
		1980s	1
Rural papers	67		

Figure 1 Flow diagram showing papers selected for review.



RESULTS

TYPES OF PAPERS

The majority of the papers are surveys/questionnaires of some kind, asking participants about career choice, often amongst other questions, and factors affecting this choice. Therefore these papers may be either prospective - participants (usually medical and health professionals students and junior doctors) are asked what they will choose in the future with no correlation with their actual choice; or retrospective - asking participants (GP registrars, GPs, other graduate health professionals) what factors have affected their choice. With these latter groups participants are relying on memory when discussing factors. A small number of papers look at the effects on choice of specific interventions such as general practice attachments or elective placements. The papers concentrate mainly on choice amongst the medical profession with a few papers relating to other health professionals. (The papers are summarized in Appendix 5 except for the Australian research papers which are listed in Appendix 4.)

The workforce data papers analyse choice without directly contacting subjects. They use data collected through other means, e.g. the National Residency Matching Program (NRMP) in the USA (government data of numbers entering general practice) and look at the characteristics of the subjects in terms of gender, age, background, university etc to suggest relationships between these demographics and career choice.

We have included opinion pieces and editorials as these contain suggestions based on expert opinion and experience, plus sometimes evidence, of ways to affect career choice and increase the number of graduates entering primary care/general practice.

CONCEPTS AND MODELS RELATING TO CHOICE OF CAREER

The majority of the papers relating to the why and when of career choice do not discuss the theoretical foundations on which their methods are based. The surveys and questionnaires ask students, junior doctors and/or vocationally trained doctors whether they have already made a choice, what affected this and, where appropriate, whether they are happy with the choice they have made. There is little mention of the literature relating to the concepts of decision making. As noted in the education literature, career decision making is often discussed as if it is a linear and rational process with students making decisions on the basis of objective data, whereas the process is in fact a complex interaction of influences on individuals. Simple surveys are unlikely to capture the complexity of these choices.²²

Dohn in a 1996 editorial reviews the specialty choice literature from 1950 and discusses the alternative concepts that may be employed to make sense of career choice. He categorises studies into three time periods based on factors suggested as affecting choice:

- 1950-1970: personality, attitudes and values plus demographics (what we may now refer to as 'nature'- see below)
- 1970-1985: effects of medical education including selection, clinical attachments, teachers and curriculum (apart from selection these are 'nurture' factors)
- 1985-1995: debt, earnings, working conditions, lifestyle, job characteristics including patient contact and diversity.²³

This is an interesting paper to read at the onset of a study looking into career choice. Dohn also comments on the atheoretical approach of the published research but points out that there is overall agreement between early literature reviewers of the range of factors, begging the question whether a theoretical research basis is necessary in a practical sense for policy makers.²³

While the single factor model (choice as a single event rather than a process), the cognitive-psychological model (subjects seeking optimum matches between career preferences and personal characteristics based on their underlying cognition) and the sociological model (factors outside the medical school related to changes in society) are of interest, they are of limited use for the purposes of looking at those factors that may be manipulated to influence career choice in our opinion. These models are rarely mentioned in the literature since 1996.

CATEGORISATION OF FACTORS AFFECTING CHOICE

These may be divided into two main categories often referred to as 'nature versus nurture' (Table 2). They may also be explored at the different stages of training: pre-university, university, prevocational, vocational, post-training. The terms intrinsic and extrinsic are also used.

The nature factors are those inherent within the student prior to entering professional training and can only be manipulated by attention to selection to medical school or university. The nurture factors, interventions applied to students/health professionals, may be influences at any time from high school, to pre-qualification programs, and onwards to postqualification posts. Research papers focus on the effects of these factors and consequences of selection policies and factor manipulation. Nature and nurture factors are also influenced by experience of working in specialties either as students or postqualification when the lifestyle and job satisfaction likely with any career choice are considered and experienced.

Table 2: Nature and nurture factors

Nature	Nurture
Gender	Clinical attachments
Age	Exposure to role models
Background/upbringing	Comments by faculty and clinical staff
Personality/personal attributes	Impressions of prestige of discipline
Income expectations	Exposure to research
Pre-training career choice	Experiences post-qualification
Academic ability particularly in science	Level of debt
Level of interest in research	
Level of debt	

PREVIOUSLY PUBLISHED LITERATURE REVIEWS

We found twelve publications that are categorized as literature reviews (Table 3). Two of the reviews^{24 25} are based on the same data – one is a report and the other a shortened version published in a medical journal. Only the report is included in the table.

Table 3: Published literature reviews

Authors and year	Country	Research question	Citations
Bland et al, 1995a ²⁶	USA	Influences on primary care specialty choice 87-93	108
Brooks et al, 2002 ²⁷	USA	Roles of nature and nurture in the recruitment and retention of primary care physicians in rural areas	37
Campos-Outcalt et al, 1995 ²⁸	USA	Effects of medical school curricula, faculty role models and biomedical research support on choice of generalist physician careers	60
Curran et al, 2004 ²⁵	Canada	Effect of medical education on the rural workforce	429
Dunbadin et al, 2003 ²⁹	Australia	Impact of rural origin and rural medical exposure on career choice	89
Hsueh et al, 2004 ³⁰	NZ	What evidence-based undergraduate interventions promote <i>rural</i> /health?	59
Laven et al, 2003 ³¹	Australia	Rural doctors and rural backgrounds: how strong is the evidence?	39
McDonald et al, 2002 ³²	Australia	Factors affecting recruiting and retaining general practitioners in rural areas:	150
Meurer 1995 ³³	USA	Influence of medical school curriculum on primary care specialty choice	44
Senf et al, 2003 ³⁴	USA	Factors related to the choice of family medicine	50
Soethout et al, 2004 ³⁵	Europe	Factors associated with the nature, timing and stability of the specialty career choices of recently graduated doctors	36

These reviews vary in scope and depth, qualities related to their initial research questions. Four of the American studies^{26 28 33 34} are the only reviews that focus specifically on medical student choice. Though three of them are more than 10 years old they form a good basis for an initial reading of the literature, and they are cited in many of the subsequent research papers published since 1995. However they are very USA-centric and their generalisability to the Australian situation has to be approached with caution. As mentioned above all American medical schools are graduate entry only and medical students choose their specialty before graduation. Primary care includes all disciplines that are practiced in a community setting (family medicine, paediatrics, internal medicine). Generalist refers to primary care physicians in this context.

Senf et al's paper from 2003²⁵ is a useful starting point as it compares the findings from all four studies (including her own). However it does not compare the different methodology used in the studies. Two of the reviews score the included papers for quality using either a score out of 7028 34 or 100.26 In addition there is a complementary paper on the full methodology for one of these³⁶ and a critique of the methodologies of published studies by the same authors.³⁷ A comparison of the American literature reviews and their main findings are given in Appendix 2 and Appendix 3.

SUMMARY OF THE FOUR AMERICAN LITERATURE REVIEWS

There are four main types of study identified:

- Student demographics and characteristics as predictors of eventual specialty choice
- Comparison of specialty preference at admission to medical school to residency or practice specialty
- Comparison of specialty choices with medical school characteristics or curricular experiences
- Comparison of specialty choices with factors reported by students or graduates to have been influential

Methods:

- Cross-sectional and cohort studies comparing student and curricular characteristics
- Cohort studies comparing specialty preferences at various times
- Randomised trials exposing some students to innovative programs and comparing specialty choice (less frequent)

Comparing Senf et al ³⁴ directly with Bland et al ²⁶ there are a number of factors that appear to have a positive effect on a career choice in primary care:

- Age – older graduates more likely to choose primary care
- Parents with lower income or education
- Rural background
- Low income expectations
- A preference towards family medicine on entry to medical school
- Attending a public university rather than a private one
- Hearing positive comments about general practice during training (and the obverse is true, hearing negative comments is an off-putting factor)
- Family medicine attachments in clinical years
- Positive role models
- Not caring too much about career prestige

In addition Bland et al ²⁶ also add:

- Female
- Previous work experience
- Lower MCAT scores for science
- Less interest in research
- Lower ratio of educational debt to expected income
- Interest in diverse patients and health problems
- Longitudinal family practice experiences

The following attributes did not appear to affect the choice, or no conclusion could be drawn from the data:

- Marital status
- Academic background
- Personality
- The admission policy of the school
- Year 1 and 2 curricula
- Faculty composition
- Debt (seems to have both positive and negative effect)

Bland et al²⁶ note that students predominantly enter medicine with a preference for a primary care career but this preference decreases over time particularly during clinical clerkships. They suggest that it is important to have an academically credible primary care faculty and that students get distorted negative images of the primary care specialties as they are learning within major academic settings. Note that in the US in the early nineties primary care was a more popular choice for students than it became later in the decade.³⁸

OTHER NON-AUSTRALIAN LITERATURE REVIEWS

The other American and more recent review has a rural focus and looks at the factors associated with the recruitment and retention of primary care physicians in rural areas from 1990 to 2000. The authors found 21 quantitative articles – all from the USA.²⁷ (Compare this with the McDonald, Bibby and Carroll review from the same year in Australia which focuses on the same question and cites 150 papers.³²) The conclusions were that rural upbringing was an important factor (nature) and rural curricula and placements particularly during residency affected retention (nurture).

The Canadian review²⁵ gives the Canadian perspective on the same rural recruitment and retention questions but with a focus on the role of medical education. This methodology is sound and well described. The shorter version published in a medical education journal²⁴ does not do justice to the full report. The authors conclude that 'the factors influencing the recruitment and retention of physicians for rural practice are complex and multifactorial' (p59).²⁵ They mention the concept of the 'rural pipeline' – a commitment to rural workforce planning and education that should begin with students prior to university and then onwards through their training. However they also note that there is no evidence that school outreach programs and other initiatives targeting students from rural backgrounds have long term effects on admissions to medical schools or choice of practising in rural areas. The evidence they present does strongly support the fact that students with a rural background who also have an interest in primary care (nature) and who are subsequently exposed to continuous and quality learning experiences in rural practices (nurture) are more likely to choose a career in rural locations. They argue that selective medical school selection would be beneficial. However we would point out that while it would be difficult to 'forge' a rural background, students who want to enter medical school might state they are interested in primary care as a career in order to gain a place.²⁵ This would be a problem with any targeted selection processes or positive discrimination.

The New Zealand paper reviews medical school programs that might affect choice of rural career. They identified 10 such successful programs based on their criteria: 8 in USA, 1 in Japan and 1 in Norway. All have selective selection of students and a primary care focused course with community-based teaching.³⁰

Finally the European team looked at career choice across all specialties and again highlighted the importance of both personal and clinical experience factors. Choice is also related to hours of work and career/promotion prospects.³⁵

THE AUSTRALIAN LITERATURE REVIEWS

Of the three Australian literature reviews, two give a full description of methodology while one reports findings only without stating the search strategy.

The Centre for Health Research and Practice at the University of Ballarat have produced an excellent review of the factors related to the recruitment (and retention) of GPs in rural areas. This 198 page document includes a detailed description of the quality assessment of the articles retrieved. It emphasizes the finding that rural background of GP and/or spouse is the most frequently reported predictor of entering rural general practice.³² In addition Dunbadin and Levitt also focus on the relationship between rural background, rural exposure during medical school and subsequent rural practice.²⁹ This is a good review despite its limitations in that it does not describe the search strategy it uses. There is a comparison between the UK, USA and Australia. The third review, Laven and Wilkinson, has a similar focus and of the twelve papers they cite, ten show an association between rural schooling and subsequent rural practice.³¹

AUSTRALIAN RESEARCH PAPERS AND PUBLICATIONS

The 57 citations in the database (including the three literature reviews) were classified using a system described by Curran et al.²⁵ The four categories, with the number of citations in brackets, are:

1 = Informed opinion article (9). Includes editorials and letters without original data. Often cite information from other published data. Includes non-systematic reviews without rigorous methodology. These articles contain the least valid evidence.

2 = Descriptive studies (34). These are original works but do not compare interventions. Includes surveys and case studies in which participants are asked about career choice and factors affecting this but the researchers do not intervene in any way in the process through extra programs, attachments etc. Analysis of workforce data also fits here.

3 = Quasi-comparative studies (10). Original studies comparing outcomes of different interventions but without controlling for the interventions in the study, ie comparison is made with historical groups, other universities, training programs etc. Differences in data collection between the groups and other confounding factors decrease the validity of such studies. Effects of rural background fit here if compared with non-rural background.

4 = Comparative studies (4). The study controls the interventions as with a controlled trial. Includes cross-sectional, case-control, cohort, pre/post-test, clinical trials and systematic reviews.

There is a problem in classifying letters that include survey data as these are short and usually do not contain enough information to evaluate the quality of the survey. We decided to classify these as informed opinion. This system is also not amenable to classification of variables that are not interventions such as background (particularly in respect of rural background). Where papers looking at rural background compare participants with those from a non-rural background, these are classified as quasi-comparative.

This classification was chosen rather than the NHMRC levels of evidence classification because the latter is weighted towards controlled trials and case control studies that are rare in this data set. The Curran et al.²⁵ system is better suited to the research papers found in this project.

In addition to this coding the papers from peer-reviewed journals that included original research data were evaluated for quality using the system from one of the American literature reviews.²⁸ This allocates papers marks out of 70 based on type of study, size of study, response rate, numbers of years covered, data source, statistical methods and the theoretical model described.

As quality measures the two systems are not complementary as using the American method²⁸ papers gain higher marks for number of participants and response rates, where the Curran et al.²⁵ categories are about method only.

There were 36 papers that could be scored with this system – these were papers with a research focus but not simply analysis of workforce data (Appendix 4). Most of these papers involved surveys of participants, usually after a non-controlled intervention such as a community placement. There were no studies involving control groups, thus the scoring is relatively low. The papers' scores ranged between 2 and 42/70, with average 20.6. This low figure reflects the fact that most of these studies are descriptive, and those that use questionnaires do not mention whether these have been validated or even used before. Moreover interview studies with qualitative analysis score low with this system as the scoring targets quantitative research. However there are enough papers suggesting similar findings in respect of factors affecting career choice and choice of rural practice that some conclusions may be drawn from them.

FACTORS AFFECTING CAREER CHOICE – THE AUSTRALIAN PAPERS

The majority of the papers published in Australia have a focus on rural workforce recruitment (and retention) and factors affecting these, which perhaps highlights the concern about problems with the numbers of rural health professionals. However this also reflects the direct research funds made available for research on rural health issues over the past decade or more in comparison to non rural projects.

PRE-QUALIFICATION

Considering the research questions in turn, firstly questions i and ii, in terms of factors affecting career choice at the undergraduate level, only a few papers addressed this issue. Tolhurst and Stewart³⁹ in a qualitative focus group study of first and final year medical students from three medical schools found that undergraduate experiences were very important in affecting career choice. The attraction of general practice related to the diversity and variety of the patient mix, the possibility of continuity of care and the community and family focus. Flexibility and the ability to work part-time were also rated as important. Some students however stated that general practice is too broad a specialty with limits to dealing with serious problems. Moreover the uncertainty factor is off-putting as is the poor remuneration, workload, paperwork and professional isolation. Some students said they had lost interest in general practice because of negative attitudes displayed by other specialists.³⁹ This tendency for hospital consultants to 'perpetuate negative stereotypes of general practice' is referred to in a letter from the executive dean of the Faculty of Health Sciences, University of Queensland.⁴⁰ This is a theme found relatively frequently in the international literature.

James Cook University (JCU) Medical School (six year undergraduate program) had its first cohort of students in 2000. This medical school has a regional mission to improve the health care of the people of North Queensland and targets regional and rural background students.⁴¹ The 57 graduating students in 2006 are being tracked to explore their career choices. Over the six years of their study the number wishing to enter general practice decreased by one-third and the number wishing to specialize in emergency medicine and obstetrics and gynaecology doubled.⁴² This change has been postulated as due to clinical experiences through attachments, and role modeling, but there is no concrete data to tease out the factors. At JCU the general practice attachment does not follow the more traditional model of four or more consecutive weeks but rather students are placed in practices for one half-day a week for the whole of fifth year. They do have some exposure to general practice in the early years for clinical skills teaching. It is not clear if this model has a negative impact on career choice, as obviously there is no comparison with similar students at the same university.

Wright et al⁴³ intend to follow a cohort of 555 medical students from four medical schools through first year to qualification. So far data is only available from the first years when career choice is likely to change, students being surveyed about intention in their first month as medical school several years before they need to choose. At this point career choice is influenced by future job security, flexibility (a recurring theme), and students' stated early orientation to hospital or community. Searle and Rogers in a report of preliminary data for a

DEST-funded project on career choice found that factors affecting the choice of specialty include prestige, scholarly pursuits and professional outcome expectations.⁴⁴ They surveyed first and final year medical students from six Australian universities: 231 responded (response rate of 47%). An interesting finding is that students stating they would choose a primary care career were more interested in professional autonomy than other students. They want independence and control of work style and schedule.

Somers et al⁴⁵ surveyed 127 first year medical students comparing the factors they stated were affecting their career choice with data previously gathered from 1373 GPs. However the two sets of data were not collected by same methodology and are difficult to compare.

Results suggest factors influencing the intention to undertake an urban career are income, access to facilities, family, and professional needs; while students who are thinking about a rural career value the community and style of practice there more than urban students.

POST-QUALIFICATION

Laurence and Elliott⁴⁶ interviewed 54 interns in South Australian teaching hospitals. These were volunteers from a total cohort of 149 doctors. At this point 50% of the interviewees had yet to decide on their career choice. Factors affecting their deliberations were what they thought would be their satisfaction in a particular job, as well as working hours and life outside medicine. Having a life outside medicine was rated highly by the majority. Influences on their choice included actually doing the job and interacting with others doing the job such as supervisors, registrars and peers. This is the only paper which also mentioned the potential for litigation as an influential factor. These doctors identified obstetrics and gynaecology and general practice as high risk jobs. The doctors who spoke about this risk wanted a career with minimal chances of being sued.

AMWAC¹³ conducted a postal survey of all doctors in vocational training in 2002 and had 4259 replies (response rate 54%). The relevant results are worth quoting in some detail, as this was a large and recent survey. An average 17.6% of the doctors were in general practice vocational training posts. It is interesting to note the timing of career choice (relying on the memories of the doctors concerned). The percentage rose from 4% at medical school entry to 20.2% by graduation, highlighting the role of nurture at medical school. By the end of PGY2 59.3% of doctors had decided, stressing the importance of availability of different clinical experiences as a factor in choice at this stage. The figure was 79.1% at the end of PGY3. Of those doctors in GP training, 65.4% had chosen this path by the end of PGY2.

This study classified factors affecting choice as either intrinsic (relating to the person) or extrinsic (relating to the job). Table 4 shows the intrinsic and extrinsic factors affecting the choice of general practice. Flexibility is a factor that recurs in many studies and seems to be one of the main attractions of general practice. There were some differences between the sexes (Table 5) with women rating work hours and men financial prospects as the main factor. GP registrars state that helping people is more important than the intellectual content of the job, reflecting here perhaps the stereotyping apparent in some medical schools that general practice is less intellectually demanding and less academic than hospital-based specialties. In some ways the registrars are propagating the stereotyping themselves. Reasons suggested for the poor status of general practice in Australia are that there are a lot of GPs in practice, their expertise while broader is of less depth, they themselves undervalue their skills and that they have a poor record in research and publications. In particular there are not enough high profile academic GPs and, as a discipline, GPs are underrepresented in medical schools.⁴⁷ These reasons are similar to those put forward in Canada.⁴⁸

GP registrars also rate their GP experience as a student as more important than role models as a factor in career choice. Of note is that these doctors would like more career guidance during training. The lack of career counselling has been noted by Hays et al who state that there is a lack of knowledge amongst interns about general practice as a career and the role of regional training providers (RTPs).⁴⁹ Though this statement was made following a survey of only 31 interns, it does correlate with the AMWAC data.

Table 4: Intrinsic and extrinsic factors

Intrinsic	Extrinsic
Interest in helping people	Flexibility
Intellectual content	Atmosphere/job culture
Appraisal of own skills and aptitude	Work experience since graduation
Domestic circumstances	Opportunity for procedural work
Job security	Hours
	Role models/mentors

Table 5: Gender difference in factors stated

Female	Male
Hours	Financial prospects
Domestic circumstances	Role models/mentors
Flexibility	Intellectual content
Type/variety of patients	Work experience since graduation
Number of years in training	Prestige
Interest in helping people	Cost of training

Pearce and Hegarty⁵⁰ in an opinion piece about choice of vocational training state that 'general practice will not be as popular with doctors from non-English speaking backgrounds who are increasingly represented in our medical schools' but give no evidence for this.

While doctors undergoing vocational training have made a choice of career at this point and gives reasons why, this does not mean that all those on general practice training schemes will eventually practise as GPs. A survey of former GP registrars who have trained between 1994-96 found that 85% of them were still working as GPs eight to ten years later.⁵¹ Important factors to account for this high retention were positive working conditions, enthusiasm and commitment to the job and being able to limit work stress.

A concern expressed in the Lockwood report through Western Australia General Practice Education and Training (WAGPET) is that the declining popularity of general practice and fewer numbers applying for training posts lead to a decrease in the quality of doctors accepted into GP training.⁵² However this report is not necessarily generalisable to the rest of the country, as Western Australia has a large number of international medical graduates working as GPs in rural and remote parts of the state. But it is important to think of the quality of the workforce and not simply the numbers of GPs and health professionals in rural areas as this does not give an indication of their performance and raises the policy question of whether any doctor is better than no doctor.

AUSTRALIAN PAPERS WITH A RURAL FOCUS

These papers address question iii, plus the issue of recruitment to rural practice beyond the influence of rural clinical schools. The importance of general practice education initiatives in increasing the rural workforce has long been recognised and led to the development of the Rural Undergraduate Steering Committee (RUSC) in 1992.⁵³ The concept of the educational and experiential 'pipeline' that leads schools then medical students to eventually become rural doctors has influenced program planning.⁵⁴ Rural clinical schools give positive experiences that promote choice of internship at the same location.⁵⁵ ARRWAG in a review for DEST also suggest that having a rural clinical school (RCS) affiliated to a medical school does increase medical students' choice of rural career pathway. However they state that it is not clear whether this is an effect of the selection process to the medical school or an effect of the RCS itself.⁵⁶ In other words students choosing to go to the RCS may have already decided on their rural career and the RCS does not change this.

However ARRWAG do suggest that there should be an extension of rural placements and that general practice should be more heavily promoted as a specialty. Evidence from longer RCS placements does indicate that these give better educational experiences, with greater community involvement and team integration for students.⁵⁷ However educational enhancement does not necessarily affect career choice.

Students who choose to move to a RCS for their clinical experience are more likely to come from rural backgrounds, however some students choose because they feel that rural clinical schools have better clinical teaching (because they are smaller) and offer good learning experiences.⁵⁸ In Eley et al's study of 25 students, only six wanted to stay in the RCS location for their internships. Reasons to stay were given as the depth of professional development expected and the support given. Reasons to move were cited as family matters, social life and career prospects. They conclude that students and doctors have different reasons for choosing to study/work in a rural location.⁵⁸ However an earlier study suggests that the influence of a spouse, work opportunities and transport issues also affect student choice.⁵⁹

Some students have expressed concern saying that rural placements should not be compulsory.⁶⁰ However, not having a rural attachment reduces their experience of rural practice and possible choice, as rural attachments are effective in enabling students to identify both the attractive features of rural practice and the challenges.⁶¹ However one must ask if a reluctant student will have inbuilt bias against rural experiences and may affect the attitudes of other students.

Rural cadetships/bonded scholarships are effective links between medical schools and rural areas. The majority of students apply for these because of financial hardships though they are more likely to have a rural background.⁶² Of GPs who had cadetships and who continued to practise in rural areas, the majority stayed in the same location as the cadetship.⁶²

Students may be exposed to rural experiences in the medical school as well, by having learning material and/or problem-based cases with a rural focus and preferably written by a rural doctor.⁶³ Short attachments, such as a rural week, increase awareness of rural health,⁶⁴ though effects on career choice are not known. The effect of rural coursework is also unclear. A study from the University of Tasmania of first and final year medical, nursing and pharmacy students found that such coursework does not appear to influence choice positively, with 69.8% of the respondents in fact stating that it had a negative effect.⁶⁵ While allied health professional and nursing students wanted an increase of rural experiences in the course, fewer medical students supported this.⁶⁵ However, the results of this study have to be approached with caution because of a very low response rate.

Talbot and Ward in a good pre test/post test previously piloted study note a rise from 48% of year 4 medical students interested in rural general practice to 81% following a four day rural placement. Reasons for change included becoming aware of rural GPs' autonomy, the role of rural doctors, life-style and challenge.⁶⁶ These are similar to factors noted by Tolhurst et al in their survey of final year students that stresses the need for positive role models. They also mention a high degree of altruism in students interested in rural careers but that the ability of their partners to find work is also important, as are good schools for children and a shared on-call.⁶⁷ A rural health module which involved medical students undertaking a four week rural health module at a School of Rural Health led to 48% of those surveyed agreeing that it had raised the possibility that they would practise rurally on qualification. However the students were not surveyed before their placement, their year of study was not given and no follow-up has taken place yet to see if this number translates into a workforce choice.⁶⁸

Australian research on rural choice points quite clearly to the fact that rural background is a predictor of choosing to work in a rural location.^{31 32 65 69 70} This seems to be true of all professions. Somers et al feel from their research in this area that the inclusion of a measure of students' intention to work in a rural setting is likely to increase the reliability and validity of selection procedures.⁷⁰ First year students with rural backgrounds from medicine, dentistry and health sciences programs held more positive views on rural health services and stated their willingness to work in rural areas.⁷¹ This study did not use a validated questionnaire and is based on student intention many years before qualification.

Half of the GP registrars with a rural background will work in rural areas. 71 The AMWAC study of 2005 lists the reasons for choosing or not choosing a rural career⁷² (summarized in Harris et al⁷³) – Table 6.

Table 6: Factors affecting choice of rural career location

Reasons for choosing	Reasons might choose (those who hadn't)
Opportunity for procedural work	Monetary incentives
Cost of training	Spouse/family considerations
Interest in helping people	Available jobs for self and family
	Working hours – ample time off
	Lifestyle in rural area
	Rural support and infrastructure
	Education and study

Rural terms during prevocational training are also effective in influencing career choice. Reasons for subsequently not choosing a rural career path (30% of the doctors) include isolation from family, perceived lack of professional support and the inability of step away from medical work in rural communities.⁷⁴

Only one Australian paper relates to the effect of the compulsory rural term during GP vocational training. Charles et al using a previously piloted questionnaire report that 1 in 3 female GP registrars are more likely to work in a rural area after the term, with 1 in 8 less likely. Again the registrars from a rural background and those who had been educated in a rural area were more likely to choose a rural career. Having children was a negative factor.⁷⁵

Important factors for female GPs deciding on practice location are: places for everyone in the family to go to school or work, flexible working hours, financial and personal recognition.⁷⁶

Wainer et al in the 'Sustainable rural practice executive summary' from Monash University based on an expert panel of 1000 rural and remote female GPs compared with 1000 male GPs has listed eight strategies to make rural practice work:

- Structure practice for how and when want to work – flexible – important for retention but also for recruitment (ie if registrar this would be a factor in choice)
- Personal strategies with holidays away from work area
- Update professional skills
- Establish personal and professional boundaries
- Exposure to rural practice before becoming rural doctor
- Network with female colleagues
- Make community own
- Professional strategies
- 'Adventurous and self-managing group of the profession with little liking for formal hierarchies and rigid work environments (p5).⁷⁷

AUSTRALIAN ALLIED HEALTH PROFESSIONALS AND CHOICE

These papers all have a rural focus but involve small numbers. A qualitative study of only ten nurses shows that rural origin is associated with the desire to work in a rural setting.⁷⁸ The abstract from a study of third year undergraduate nurses after a rural placements in mental includes the phrase 'it is hoped that' such clinical placements will affect career choice, however there is no evidence to support this in the paper.⁷⁹

This reflects the problems of some published work that speculate or give opinions following small evaluations or case studies (see also Neill and Taylor⁸⁰). Two quality studies that looked at the effects of rural placements on future rural employment amongst nursing and allied health professional students found that the quality of the placement is important but rural background is a major factor in choice.^{81 82} Nursing students from rural backgrounds are more likely to choose rural clinical placements⁸³ that subsequently affect career choice. Factors that nursing students consider important when deciding on where to work after graduation are the presence of friendly supportive staff and the potential for learning and continuing education.⁸² Similar factors influence occupation therapy students for whom positive rural fieldwork placements with good clinical supervisors are important.⁸⁴

Schoo et al have designed a conceptual model for recruitment (and retention) of allied health professionals in rural Victoria. A conclusion is that 'recruitment and retention (are) likely to improve with a set of actions that includes: the provision of CPD and work exchange opportunities, teaching managerial competencies, utilising the various disciplines and allied health assistants, enhancing student placements, creating a supportive and creative work environment and having an active and supportive community'.⁸⁵

One paper that looks at the effects of a pilot rural interprofessional placement for undergraduate health professional students (medical, nursing, physiotherapy and pharmacy) found that such attachments strengthened all students' interest in rural health care.⁸⁶ Medical students, however, reported less of a positive impact than the other groups. While these students did volunteer to enter this two-week program, and therefore were likely to have some interest in rural practice already, their intention to work rurally in the short term at least did increase and was retained at follow-up. The students also developed their understanding of other professions through this interprofessional immersion but it is not clear if their improved teamworking ability was part of the attraction of rural health care.⁸⁶

SYNTHESIS OF FINDINGS ACROSS ALL NON-AUSTRALIAN PUBLISHED DATA SOURCES

(The non-Australian papers and documents are summarized in Appendix 5, as are the Australian papers not listed in Appendix 4.)

One hundred years ago Parsons described three elements relating to a person's choice of career: self knowledge, an understanding of the world of work and reasoning based on the relationship between the first two.⁸⁷ This has parallels to the nature/intrinsic and nurture/extrinsic factors involved in choice. While these elements will interplay to some extent when a student is choosing medicine itself as a career, they will also affect later career choice, emphasizing the importance of authentic clinical experience for medical student to help them gain that understanding of the workplace.

In this section we synthesise the non-Australian data against the four research questions.

QUESTION I

Main focus: What is known about the factors that may attract or detract the new generation of doctors from a career in general practice?

'Our challenge as old-timers is to understand the goals and motivating forces for both of these younger generations and combine them with the powerful motivating forces that created our discipline [of family medicine], so that they can assist us in moving forward with energy, enthusiasm and focus in the 21st century.'⁸⁸

NATURE

Can medical school selection help address workforce issues? A survey of 120 medical schools in the USA suggested that schools with premedical recruitment activities targeting future generalists admitted greater proportions of students interested in primary care and rural practice.⁸⁹ In Canada an outreach program focusing on family medicine for school students showed that the presentations had an influence on study choice.⁹⁰ Medical schools that enroll more students with an interest in family medicine, graduate more students on family medicine residency programs.^{91 92} However subjects studied before entry to graduate programs (as in the USA) do not appear to influence choice.⁹³

The American literature reviews as detailed above indicate several nature factors impinge on choice. A more recent American study correlated with many of these: the selection committee of the University of Virginia looked at what factors at selection might be predictive of subsequent primary care career choice. It concluded that predictive ability was low. Factors suggestive of primary care choice were female gender, rural residence, no previous research and history of high level of community service. Factors against choice were science background, higher MCAT score and having parents who had gone through higher education. The single best predictor was stated career choice at entry to medical school.⁹⁴ However a note of caution from the New York Medical School that selected more applicants interested in a generalist career in the late nineties – they suggest that such applicants are almost certainly aware that some medical schools look more favourably on potential students who state an interest in primary care.⁹⁵ A much older paper (a survey from 1993) correlated with the age factor from the reviews – older graduates are more likely to choose primary care, being more influenced by family responsibilities and therefore choosing a shorter training program.⁹⁶

Such data has led to recommendations to change admissions policies⁹⁷ followed by the development of a subsequent pathway in primary care.⁹⁸ Another suggestion is to find out which students are interested in family medicine from the start of their studies and arrange extra suitable activities for them⁹⁹ though family medicine interest groups (FMIGs) as advocated by the American Academy of Family Physicians may not influence the number of students choosing family medicine.¹⁰⁰

In the nature versus nurture debate, the question also must be asked whether students choose medical schools on the basis of their possible career choices.¹⁰¹ Do they look at medical schools and see that they offer different clinical experiences? There is no clear answer to this question.

While recent papers do not look at students' personalities to any great extent, an American study correlated attachment style with career choice. Students rating themselves as more comfortable or secure in relationships chose primary care in preference to non primary care specialties.¹⁰²

NURTURE

In 1999 Sir Denis Pereira Gray of the University of Exeter wrote in an editorial: 'If famous medical schools cannot convince some of the brightest young people in Britain of the rich intellectual and emotional rewards of GP medicine, they must be failing in some way to demonstrate the potential of the discipline'.¹⁰³ This comment eloquently highlights what might be perceived as a failure of nurture to help solve the workforce crisis. The director of the Division of Medical Education of the American Academy of Family Physicians also stressed the influence of the university as a nurturing institution: 'The infrastructure of US medical education continues to play a powerful role in determining how many graduates enter family practice residencies. The presence of a well-funded dept of family medicine and the number of faculty are correlated with the higher percentage of medical students entering family practice

residencies. One of the most important variables for predicting the proportion of students at medical schools who choose family practice is the proportion of faculty who are family physicians'.¹⁰⁴

There is a definite sense that general practice is a less prestigious career choice than hospital based specialties both in the papers and interviews we have conducted. This view is echoed in Europe¹⁰⁵ USA¹⁰⁶ UK¹⁰⁷ and Canada.⁴⁸ Negative remarks by clinicians and faculty staff about primary care and general practice occur during medical school training¹⁰⁸ and have been suggested as reasons for students' attitudes.¹⁰⁹ This may also be a factor in why the number of students stating they would choose general practice decreases during their university program.¹¹⁰ However one study found that while negative comments are heard more frequently about family practice (in the USA), this does not appear related to increases or decreases in the proportion of students choosing family practice.¹¹¹ GPs in practice themselves should be more positive about their work and be more high profile in teaching hospitals.¹⁸ There is also a possible lack of knowledge by students as to what general practice entails so that informed choice is difficult,¹¹² the reality of the job being a surprise.¹⁰⁸ Such knowledge is helped through GP attachments, with results from one UK medical school showing that an increased number of students expressed a preference for a career in general practice after exposure to GP teaching.¹¹³ However some students do seem to be affected by their knowledge of the health service: the managed care system in the USA may be turning students away from family medicine,¹¹⁴ ¹¹⁵ while the publicized low morale of GPs in the UK may be a factor.¹⁰⁷

Students choose general practice for the patient interaction possibilities more than the scientific challenges¹⁰⁵ and have goals to practise in underserved areas.¹¹⁶ They value the development of long term and special relationships with patients¹¹⁷, continuity of care and family interactions¹¹⁸, the diversity of problems¹¹⁹ ¹²⁰ and the social and community focus¹²¹ but they also want to be rewarded with fair pay for their efforts.¹¹⁵ As the psychosocial attractions of patient interactions decrease from year one to year four (in one American school) so does the attractiveness of a career in primary care.¹²²

While some students enjoy the prospect of having to work in a broad area of specialization, others are deterred by the broad knowledge required.¹¹⁴ However opinions as to the intellectual content of family medicine vary – at one medical school in the USA some students chose family medicine because of the high intellectual content while others stated there was insufficient intellectual content.¹²⁰ Medical students in Scotland choosing general practice rated their academic ability as lower than their peers.¹²³ For those students who undertake an honours year (an extra year in some UK medical schools) the department in which they do this affects their career choice.¹²⁴ Role models are mentioned frequently as important factors¹²⁵ ¹²⁶ ¹²⁷ and rotation experiences and role models are the top two influences on choice.¹²⁸

One way to overcome resistance to family medicine is to offer financial incentives to family medicine residents.¹²⁹ This could be seen as similar to bonded medical school places, an initiative that has not found favour with the Australian Medical Student Association (AMSA) (as discussed during the stakeholder interview). Scherger recommends that family medicine should be the most helpful specialty at medical school in helping students choose residency programs – an interesting exercise in vertical integration.⁹⁹

That there are differences in nurture at different medical schools is reflected in the variation in percentages of students choosing general practice. This is discussed above in relation to Australia but also appears to be the case in the UK.¹³⁰ One department of general practice in a UK medical school has speculated that the increase in the number of its graduates choosing general practice is related to its investment in faculty teaching development and the subsequent high ratings for practice-based teachers in student feedback as well as the importance of primary care being emphasized by all medical school staff.¹³¹ In the USA publicly funded medical schools are likely to graduate more students interested in family medicine than the private one¹³² – a finding that may or may not be reflected in Australia as the private medical schools begin to graduate doctors. There are likely to be many factors interacting in this variation. In respect of medical school curricula delivery one early paper suggested a link

between problem-based learning and choice of primary care.¹³³ However this hypothesis came from looking at only eight medical schools in the USA and has not been mentioned in other countries.

Medical schools which undertake more research produce fewer family doctors, possibly because research activity is at the expense of student and resident teaching and mentoring time.¹³⁴ However students who do choose a primary care career are less likely to undertake research projects during their studies¹¹⁶ and students who are interested in research are less likely to choose family medicine.¹³⁵ Kutob et al's survey was of heads of departments and faculty at 24 American medical schools with the conclusion that upper level institutional support is needed to influence family medicine career choice.¹³⁴ However medical students may not like to feel they are being forced into primary care.¹¹⁵

POSTQUALIFICATION CHOICE

'Career choice is a complex and multifactorial deliberation'.¹³⁶

The factors that attract medical students to general practice tend to be about the content of the work whereas junior doctors (and some final year medical students) become more concerned about working conditions. The Australian papers suggest that flexibility of working hours and conditions is important and that general practice is seen to offer this choice. This is in contrast to some American data that suggests students believe family physicians are unable to control their work hours.¹³⁷ However it fits with an economics modeling exercise from Michigan that implies that medical residents prefer primary care specialties with shorter and more certain work weeks, though the potential for higher earnings is also a factor.¹³⁸ In the UK junior doctors choosing general practice are more concerned with the lifestyle choice than professional aspirations,^{107 108} in the USA lifestyle is becoming increasingly important as a factor in career choice¹³⁹, and in Canada the most influential factor for doctors under 35 years old choosing family medicine is workload, flexibility and predictability.¹⁴⁰ The balance between work and home life is the most important consideration, though this is rarely experienced during training.¹⁴¹ While enthusiasm and commitment to a particular job are important, so are domestic circumstances and work hours, with experience of the job in training also affecting choice.¹⁴²

Female doctors in all countries surveyed in particular value flexibility^{141 143} with many prepared to trade some interest and variety in the job for increased flexibility,¹⁴⁴ smaller practices and part-time work¹⁴⁵ as well as part-time training posts.¹⁴⁶ This again highlights the importance of students and junior doctors being exposed to real general practice and the thoughts of GPs as to working conditions. As Hayden writes from the UK: 'General practice needs to communicate balanced messages on recruitment and appointment ratios and what might be expected from a career in general practice now and in 10 years' time'.¹⁴⁷

Data from New Zealand suggests that medical school debt and its psychosocial impact plays a significant effect on quality of life and career choice.^{148 149} Studies in the USA have also shown an inverse relationship between the level of debt and choice of primary care, results from a decade apart.^{150 151}

As in Australia, American family medicine residents are usually satisfied with their choice of career, valuing the opportunity to provide preventative care.¹⁵² However concerns in the USA about workforce choices has led to the formation of the 'Future of Family Medicine Project Leadership Committee' which has defined core values for family medicine, recognizing the need to make family medicine even more attractive as a career option. However they have not yet addressed how to do this.¹⁵³

The only paper that looks at the difference that graduate versus non-graduate entry medical school training makes to career choice is from the UK.¹⁵⁴ Like Australia, the UK has a mix of graduate and undergraduate schools. This paper surveyed an impressive 13 088 doctors in three cohorts (qualified in 1999, 2000 and 2002) with a response rate of 65%. At the end of the pre-registration (intern) year a higher but non-significant number of graduates stated that

general practice was their first choice of career (32% versus 29%). The cohort three years after qualification showed a significant difference with 38% graduate entry versus 32% undergraduate. Female doctors were more likely to choose general practice from both groups. The main reasons for choice were enthusiasm and commitment to the specialty and experience of the jobs. For graduate entrants domestic factors were more important and this was particularly the case for those doctors who chose general practice. Graduate entrants were more likely to have decided on a career before entry to medical school, reflecting their age maturity. The authors conclude that these are modest differences and that 'at least on the current criteria used for selecting students, increasing graduate entry will probably not make much difference to the percentage of newly qualified doctors seeking careers in different branches of practice'.¹⁵⁴

Strategies to increase student interest in generalist/family medicine careers have been suggested by many commentators, taking many of the above factors into account. Improving job satisfaction among role models and increased government funding for primary care research and research training are two suggested key areas.¹⁵⁵ A broader conceptualization of general practice with an increased emphasis on the patient-centred nature of the patient-doctor relationship has also been put forward to enhance the attraction of general practice.¹⁵⁶

TIMING OF CHOICE AND CAREER COUNSELLING

This has been mentioned in relation to the Australian papers above but the data is worth repeating here to highlight the importance of nurture not only at medical school but also postqualification. About twenty percent of students have chosen their career path at graduation¹³ and only about fifty percent of interns have chosen.⁵¹ In New Zealand 47% have chosen at graduation¹⁴⁰ and in the UK about one third¹⁵⁷ to one half.¹⁴¹ However Grant et al in their longitudinal study of foundation year 1 and 2 doctors in the UK (PGY1 and PGY2), found that only 38% of these doctors had made their choice at the end of F1 rising to 57% at the end of F2.¹⁴² Mahoney et al suggest that there is a critical period during the end of medical school training and the first two years after qualification in which career intentions change and that careers advice should be available during this time.¹⁵⁷

Such career counseling for future doctors is often lacking and should be provided in the latter years of medical school because of the numbers of graduating students still needing to make a choice. Perhaps even information about the 'marketplace' and financial implications is required.¹⁵⁸ Informal advice about career choice from more experienced peers is most common¹⁴¹ and of the second highest quality after the Internet¹⁵⁹; information on career choice provided by medical schools is poor¹⁵⁷ and less useful.¹⁴¹ Junior doctors in the UK feel that useful career advice is currently lacking after qualification and would value such advice in their first year of work, when many have not made their final career decisions but are thinking of these.¹⁶⁰ However it is not clear what sort of advice they need (eg career progression, content of specialties, training required etc) and what difference it might make to them.

QUESTION II

Main focus: What is known about the influence of GP placements at the pre and post qualification phases of medical education on choosing general practice as a career?

'Every medical student deserves a memorable experience in family medicine'.¹⁶¹

There is conflicting data about the importance of general practice/family medicine clinical attachments in career choice but this highlights the variety of clinical placements on offer with differences in timing, length, breadth and quality. Personal experience of general practice including through GP attachments does seem to be an important factor for students in the later years of their course, though they are influenced mostly by the media in their first years.¹⁶² Early exposure to meaningful family practice experience is also important¹²⁴ but short attachments (less than one week) in first year do not seem to have an effect.¹⁶³ The number of family medicine and primary care clinical rotations is important⁹²

but third year generalist experience may not influence choice when viewed retrospectively.¹⁶⁴

Interest in general practice increases during the time students spend in practice and community attachments but this increase in interest is also seen during hospital terms, showing the immediacy of the experience counts for those students who do not have firm career intentions at this time.¹⁶⁵ Moreover change to choice of general practice after a good attachment may be temporary, as hospital intern posts cause a shift back to hospital choices.¹⁶⁶

Students who undertake family practice attachments and enjoy a good experience are more likely to choose family practice as a career^{120 167} even if they were not interested in the specialty beforehand.¹⁶⁸ However even if general practice terms do not influence career choice, they do help students have a higher regard for the work of GPs.¹⁶⁹ On the other hand increased time in general practice attachments might reduce students' interests as their GP teachers may have less time for mentoring.¹⁷⁰ This may also be a problem when student numbers increase. Clinical time with patients is lost due to teaching and student placements, though GPs enjoy teaching.¹⁷¹ This has to be considered when extra student places are needed.

Family medicine electives are an additional experience promoting choice.⁹¹ The university of New Mexico introduced a parallel primary care curriculum in 1979 and found that students who undertook this were more likely to stay in New Mexico and work in primary care.¹⁷² However this paper reports data from student cohorts from 1980 – 1994, even though it was published ten years later. Moreover the first students were volunteers, which again raises the 'nature versus nurture' question as with other interventions of this kind. International health electives also appear to influence participants' later decisions to work in the community, particularly with in underserved areas.¹⁷³

The impression that general practice and family medicine experience affects career choice has led to many commentators and editorials calling for a greater proportion of the curriculum to be community-based¹⁷⁴ and a more visible presence for family practice in medical schools.^{175 176} 'Medical schools with family medicine departments continue to produce graduates who are more likely to enter family medicine residency programs than medical schools with other or no administrative structure in family medicine'.¹⁷⁷ Of course all medical schools in Australia have departments of general practice.

Junior doctors are now undergoing GP attachments as interns and PGY2 (postgraduate year 2) in Australia and during their foundation years (F1 and F2 -first two years after qualifying) in the UK, a time when many are still choosing their careers. The effects of these rotations are just beginning to be reported. Similar posts have been available before and in fact the abolishment of rotating internships in Canada in 1993 has been suggested as one of the causes of the decrease in numbers applying to family medicine training.¹⁷⁸ An evaluation of pre-registration house (intern) posts in general practice in the UK (introduced before the foundation year changes) found that while all specialty posts after qualification affect career choice, this was more apparent after general practice posts, with the highest rate of change in career choice to general practice.¹⁷⁹ A recent survey of foundation year doctors shows that more state they will choose general practice as a career than a survey at a similar time after qualification from 1995.¹⁵⁹ This may be due to the foundation year experience or to the fact that students now have more general practice and community exposure while at medical school. Grant et al in their 2005 survey of F1 and F2 doctors found that there was equal movement towards and away from general practice as a career during F1 but a greater movement towards general practice than away from it during F2,¹⁴² a finding reinforced in a 2007 study.¹⁸⁰ F2 doctors are glad they have done an attachment in general practice and the attachment reinforces their decision to become GPs.¹⁸⁰ One F2 doctor in an essay in the *British Journal of General Practice* writes eloquently of his positive experience in general practice and the effect this has had on himself and peers.¹⁸¹ As actually doing a job is important in career choice⁵¹ the opportunity to work in general practice at an early stage is vital.

QUESTION III

Main focus: What is known about the effects of introducing interprofessional primary healthcare teams in terms of attracting health professionals to work in the community (doctors, nurses, other health professionals)?

There is very little published data about the effects of potential teamwork opportunities on career choice. An American paper looking at interdisciplinary rural clinical experiences really only showed that the effect on career choice was the rurality factor rather than added value of the teamwork factor.¹⁸² The RHIP (rural health interdisciplinary program) at the University of New Mexico is designed to familiarize pharmacy, medical, occupational therapy, speech therapy, physical therapy and nursing students with health care in rural areas and to make rural practice more attractive. The program appears to have fulfilled this aim for the various therapy and pharmacy students who are more likely to choose to work in underserved and rural practice compared to controls, but did not affect medical and nursing student choice.¹⁸³ Shannon et al report that students undertaking an interdisciplinary rural attachment are more interested in rural careers afterwards.¹⁸⁴ However, again, the actual effect of the interprofessional/interdisciplinary experience apart from the location is not clear. Even with canvassing some of the main international experts on interprofessional education and practice through InterEd (the international network of interprofessional education) little was forthcoming. Indeed the InterEd board felt that this is a research area ripe for exploration. Anecdotal accounts from Canada suggest that medical students say that although they support working with new interprofessional models of primary care, they have concerns about the new roles that nurse practitioners are promoting (Professor Louise Nasmith, University of Toronto: Department of Family and Community Medicine, personal communication; 2007). Such concerns do reflect a lack of understanding of scopes of practice and professional roles, and how to determine the best mode of practice for patient needs and populations.

Even without firm evidence there are calls for changes to family practice and a move to more teamwork to cope with frustration and increasing demands on doctors' time that may affect career choice.¹⁶ More work certainly needs to focus on the differing attitudes and concerns related to interprofessional teamwork of health professional students and qualified clinicians.

QUESTION IV

Main focus: What is known about the effects of rural clinical school experience on the career choices of health professionals

While this question specifically focussed on the role of rural clinical schools on career choice, the majority of the papers looked more broadly at rural placements in general. These, of course, can be of variable lengths. Rural attachments give students the opportunity to experience rural life as through the eyes of clinicians, and particularly for those students from urban backgrounds, such placements may help dispel preconceived ideas about rural life and opportunities.¹⁸⁵ For example following an American four week rural primary care placement students' ideas about rural doctor workload changed so that they realised demand on doctors was no so great as they had thought and also that rural doctors had a greater expertise than their urban counterparts.¹⁸⁶ The Rural Physician Associate Program (RPAP) in Minnesota has been training students in rural communities for the past 34 years. Students recognise the value of a learning environment where they experience continuity of care, and 62% of students trained by the program currently practise as primary care physicians.¹⁸⁷

On the rural question the overwhelming factor that attracts health professionals to rural practice is rural background and this is shown again and again over the years.^{26 31 34 65 70 71 72 73 74 76 81 167 188 189 190 191 192} Dunbadin and Levitt also showed a strong association if one's partner grew up in a rural area: rural GPs are 3.14 times more likely to have a partner with a rural background than urban GPs.²⁹ The influence of a spouse in the decision to choose a rural practice is high, and the ability of the spouse to work and/or integrate with the local community

is important.¹⁹³ The Canadian literature review²⁵ concludes that rural background is overwhelmingly the most important independent predictor of rural practice.

Students from backgrounds in medically underserved areas (MUAs – in Canada) are also more likely to work in MUAs latter.¹⁹⁴

The argument for undergraduate and prevocational experience affecting rural choice is becoming more evidence based. Early work suggested no association with undergraduate rural exposure but this project has questionable methodology.¹⁸⁹ A one month rural elective running for twenty years in rural Appalachia, partially funded by the state government, has been successful in attracting rural doctors. Students who complete this attachment are three times as likely to practise in a rural area¹⁹⁵ however the effect of self-selection and prior interest in rural work has to be taken into account when noting this figure. A compulsory rural primary care clerkship at one American medical school has also resulted in an increased preference for a future career in a rural community.¹⁹⁶ In New Zealand a seven week rural attachment for year 5 students has been shown to produce a positive attitudinal change to rural practice, but the main factor in rural choice was still coming from a rural background.¹⁹⁷ Similar effects have been shown in Canada.^{191 198 199}

In the USA there is a difference between medical schools in numbers choosing rural practice. Publicly funded medical schools produce more rural physicians than private ones.²⁰⁰ It will be interesting to see if this is the case for the new private medical schools in Australia. Some of this variation may of course also be due to selection policies as well as to fees.

In the USA rural residency tracks (rural attachments following graduation) are voluntary during family medicine training, unlike in Australia. Residents who choose these tracks are more likely to go into rural practice²⁰¹ but they may choose the tracks because of a prior interest. Male residents choosing a rural career decide on the basis of income, medical need in the community and their loan repayments, while female residents are influenced by their spouses, their working hours, familiarity with the community and support facilities available.²⁰²

The Society of Rural Physicians of Canada has set up a task force to investigate strategies to increase the enrolment of students of rural origin into medical school. This task force has made a series of recommendations including: introducing rural components into university programs, establishing counselling and support services for rural students, providing funding support and including rural doctors on selection committees.²⁰³ Cultural immersion through rural training programs based in rural communities is another suggestion.²⁰⁴ As yet there is no evidence to see if such recommendations have had an effect in the country.

CONSULTATIONS WITH STAKEHOLDERS

We interviewed representatives from the following organisations:

- The Royal Australian College of General Practitioners (RACGP)
- The General Practice Registrar Association (GPRA)
- The Australian Divisions of General Practice (ADGP)
- General Practice Education and Training (GPET)
- The Australian Medical Students Association (AMSA)
- The Royal College of Nursing, Australia (RCN)
- The Medical Deans of Australia (formerly The Council of Deans of Australian Medical Schools - CDAMS)
- General practice medical educators in the UK

In addition we had contact on-line with:

- The Royal College of General Practitioners, UK (RCGP)
- The College of Family Physicians of Canada
- InterEd (an international organisation promoting interprofessional education and practice)
- The Network/Toward Unity for Health (an international organisation of community-orientated health professional education institutions)

The discussion, comments and documents supplied by these stakeholders reinforced the findings of the literature review. The organisations are concerned with lack of recruitment into general practice and, in relation to practice nurses, the lack of a proper career structure for nurses in these settings.

A common discussion point was the changing nature of general practice and the lifestyle aspirations of GPs. Many GPs no longer choose to work full-time and the flexibility of working hours is attractive for both doctors and practice nurses. The potential to vary working hours and the diversity of the workload should be highlighted as major attractions of general practice. The move towards GPs taking on special clinical interests should be encouraged, though the importance of overall general practice care provision should not be forgotten. In particular for many doctors ten sessions a week is no longer sustainable and models are needed to help health professionals work shorter hours while still providing continuity of quality care. A shorter working week is likely to lead to less burnout among doctors so ensuring that even though doctors may work fewer hours in a week, they will continue to work for longer overall in their careers. One obvious way to do this is with enhanced interprofessional team care. Team care also reduces professional isolation. However different funding models would be needed as well as the provision of training for all health professionals working in this way.

General practice must be a major feature of medical school programs, as should rural general practice attachments. However quantity should not be delivered at the expense of quality. The rising medical student numbers will place an increased burden on departments of general practice recruiting GPs to act as tutors and to host students within their practices. Moreover with the ideal that all junior doctors should be able to undergo a PGPPP attachment, the competition for quality GP training positions will be immense. While the ADGP offers support to GPs who teach medical students, it does not have a policy as such on recruitment into the workforce. However they do run career fairs for medical students to help educate them about the nature of the job of general practice.

The Medical Deans of Australia has no policy on workforce and recruitment but as an Australian Medical Council (AMC) accredited body their role is to ensure that medical schools graduate doctors as interns who have been exposed to all branches of medicine during their training. However they endorse the movement of more of the medical program into the community as this broadens the context in which medical students learn. Role models are important but it would be difficult to fit career counselling into an already crowded curriculum. Possibly having students exposed to GPs earlier in their study, for example as tutors for case-based or problem-based learning session, will help influence students, though this is not the primary reason for this change.

AMSA believes that medical students are becoming more aware of workforce issues and the obvious shortages of doctors. In spite of the rural problems the association is not keen on the bonded student places scheme as they feel that 18 year old are not in the position to make a choice on their future careers. The applicants to medical school have as their focus getting into medical school and will often do this at any cost, not realising the consequences of a six year bond. AMSA prefers other ways to encourage rural recruitment like more rural attachments particularly in final year. AMSA is happy to have more general practice education in medical programs, particularly in the early 'pre-clinical' years, maybe once a week or fortnight but recognises that GPs need more information about the medical school curricula and about having students in practice as many GPs are concerned about what it entails.

They need more support and awareness of the legal implications. There is still a feeling amongst some students that general practice is a less prestigious career.

Working GPs need to advertise the merits of their jobs and help get rid of the notion that they are 'just a GP'. Procedural work is important for many male potential GPs while flexibility is the attraction for females.

In keeping with the necessity of stressing the merits of general practice as a lifestyle choice, the importance of general practice to the health of the nation must also be highlighted. While hospital based and acute care may seem the exciting side of medical practice, and managing chronic disease in the community the less attractive option, the diversity and breadth of general practice should appeal to doctors wanting autonomy within patient care. The chance to build up longstanding and meaningful patient-doctor relationships is one of the hallmarks of general practice that students do not always appreciate in their short attachments. An improvement to the image of general practice could be engendered through the media – in particular the majority of television medical programs focus on secondary care. There is a need for a realistic and uplifting TV series set in general practice.

There is ongoing debate about the necessity of GP registrars to undergo a mandatory time in rural general practice. These placements, while helping to increase the rural medical workforce and give doctors a realistic view of life in a rural area, can have detrimental effects on family life. There must be adequate support for these doctors. Whether the compulsory rural term reduces the likelihood of some doctors choosing general practice training is unclear.

Team care is also attractive to practice nurses and they value the opportunity to work with general practitioners. There is a variety in the amount of exposure to community nursing and general practice during nurse training so that many student nurses have no experience of this career choice. As clinical placements influence career choice this is detrimental to the practice nurse workforce. Moreover student nurses are rarely exposed to community role models. In common with medical students, nursing students have very little in the way of career counseling. Pre-qualification nurse training tends to concentrate on acute care. Therefore the ADGP sponsors voluntary clinical attachments in general practice for student nurses to give them experience of the practice nurse role.

While giving all nursing students the opportunity to spend time in general practice would be ideal, this would have major resource implications, including who would be responsible for student supervision and educational input. Following qualification there is no dedicated training for practice nurses. The ADGP would like to see a graduate program based in general practice with support and mentoring. This would enhance general practice and GP experience as GPs like to have well trained nurses in their practices. The RCN wishes to promote practice nursing also with training and proper career progression, as well as increased autonomy for nurses so that patients could book in directly with them in a similar way to the UK system. The ADGP provides financial modeling services to GPs to help them look at the impact on workload and finances of employing a practice nurse.

It is interesting to note at this point that in the last year there has been an increase in the number of doctors applying for general practice training in the UK. GP medical educators feel there are a number of reasons for this:

- Shorter training time for general practice compared to hospital specialties, which has become more attractive following recent changes to the application process for specialist hospital training
- Discontent with hospital lifestyle and training following these changes
- Increased remuneration for GPs in last three years
- Flexible lifestyle choices within career
- The educators are also concerned that some doctors are choosing general practice for the 'wrong' reasons and may not be happy in the long term with their choice.

INTERVIEWS WITH MEMBERS OF THE WORKFORCE

To help triangulate the findings of the literature review with the current situation in Australia we interviewed a number of medical students, junior doctors, GP registrars and GPs. The interviewees were recruited through:

- Friday Fax (the weekly on-line newsletter of the RACGP, distributed to all members and fellows so readership is mainly GPs but also GP registrars and some medical students)
- The University of Sydney medical student electronic notice board – addressed to fourth year students only
- Emails to GPs who have University of Sydney medical students in their practices
- Through a medical educator contact at James Cook University Medical School who asked for volunteers from the medical students and junior doctors at Mackay Base Hospital
- Through a regional training provider medical educator – recruitment of PGPPP doctors

We were restricted through our ethics approval to ten University of Sydney students (we had many more volunteering than this). As this part of the study was to inform the literature evidence base we did not attempt purposive sampling. Each person who volunteered to be interviewed received a participant information sheet and signed a consent form. The semi-structured phone interviews were conducted by the project’s research assistant, audiotaped and transcribed. The data was coded by the research assistant and one of the chief investigators in line with qualitative methodology and using Atlas^{ti} software. The coding was compared and themes identified.

PARTICIPANTS

There were 38 interviews.

Table 7: Interviewees

Designation	Number	Male: female	Comments
Medical students (MS)	13	3:10	
Junior doctors (JHO)	5	2:3	3 x PGPPP
GP registrars (GPR)	5	3:2	
GPs (GP)	15	8:7	

The interviewees are designated as MS; JHO; GPR; GP in the quotes given and by a number (MS 1- 13; JHO 1 - 5; GPR 1 – 5; GP 1 – 15).

Table 8: Themes identified

Theme families with sub-codes are given below.

Theme family	Sub-codes
Factors affecting career choice in general	Choice not affected by medical education
	GP seen as inferior choice during education
	Medical education mainly hospital based
	Role models
General practice exposure at medical school	Comparison of GP with hospital
	Effect of GP attachments
	Generalist versus specialist
	Having GP exposure earlier during training
	More stimulating than expected
	Needs hands-in experience not just observation
	Perceptions of GP while a student

	Sell GP as a great job
The attractions of general practice as a career	Continuity of care
	Flexibility and hours
	Lifestyle
	Stimulating and lots of variety
	Working with people
	Autonomy
	Prestige
	Skill mix
	Social status
	Holistic care
Making GP more attractive as a career option	Increase flexibility
	Reduce government interference
	Better communication between GPs
	Pay
	Portray as enjoyable career
	Doing procedures
	Enhanced recognition of GPs
	More support
	Less time pressure
	Students to gain better understanding of role
	Increase availability of part-time training
What makes GP unattractive	Lack of support
	Not intellectually challenging
	Lack of time with patients
	Negative media coverage
	Lack of prestige
GP teaching	Enjoyable to have students in practice
	GPs not trained to teach
	Remuneration factors
	Increases status
Teamwork and effects on choice	Attractions of interprofessional teams
	Lack of training in teamwork
	Team as support
	Teamwork important
Effects of rural attachments	Compulsory rural term
	Reasons for being rural GP
	Hard work

FACTORS AFFECTING CAREER CHOICE IN GENERAL

A principal factors affecting career choice for any specialty are the role models encountered during medical school and post qualification.

I think the biggest influence is seeing good role models. (MS1)

I'd say that the education of young students is done by specialists and not by general practitioners and the result is that they learn to see specialists as role models rather than GPs. (GP2)

I can't believe how many of my colleagues at university ended up in specialty areas because they met one person that they admired during there studies. (GP5)

Some students take a long time to decide on a career and have various influences affecting that choice.

So then I thought you know sort of fell into medicine which was you know all well and good and then all through the medical course I sort of kept changing my mind what I thought I would end up doing and by final year I thought I was going to be a, physician...maybe geriatrics but I did incredibly badly in final year and then got the last choice of hospitals and the last choice of rotations in that hospital and all the doctors at X hospital that year failed their physicians exam. And I thought you know I don't want to be one of these guys like them whose sitting in for the 2nd 3^d 4th time and gonna fail... (GP4).

GENERAL PRACTICE EXPOSURE DURING MEDICAL SCHOOL

There was a difference of opinion as to the effect of the medical student education experience upon choice of career. In part this may reflect how long it has been since some of the interviewees had qualified as doctors. Those doctors who were at medical school more than five years ago felt that general practice was relatively neglected as a discipline. More recent graduates and current medical students are exposed to more general practice experiences during training. In some cases the students felt there was too much general practice exposure and too much emphasis on the fact that a high proportion of graduates would become GPs. These thoughts reflect the changes in medical school curricula in the last decade.

I think that general practice was such a small you know component of your work, and certainly you didn't have a lot of exposure to it in your last year of medicine. (GPR1)

I actually think my medical school has super saturated me with general practice probably if I had less exposure and better quality exposure I'd feel more open to the idea of general practice. (JHO3)

The importance of good quality general practice attachments was stressed. There was a call for earlier and more exposure to general practice than previously. Again this suggestion was made primarily by doctors who had qualified some years ago. While the current medical students believe that they have plenty of GP experiences they want these to involve hands-on practice rather than simple observation. GPs should also have a high profile in the medical school and be involved in teaching throughout the course.

Well I think if people never experience it they're never going to choose it or they'll only choose it by accident so I think that general practice experience... has to be high quality with people who love the profession... (GP10)

But whereas you've never seen GP and how they actually operate and so we don't really so I think people falling in or are interested in other specialties because of exposure to them whereas we're not exposed to GP so if we were maybe earlier on in the course it might be more attractive. (MS5)

I think that, so you know things like having experienced medical school having general practitioners involved in undergraduate and post graduate training is really important. (GP13)

Because it became more positive because my initial thought was that general practice was too limited and too boring but I saw that there's actually a lot more interesting things you can do (GP3)

It's turned out to be a lot more mentally stimulating than what I was expecting. (GPR3)

But I spent a lot of time sitting in and watching which I would sometimes tune out with. And I appreciated the times when I sat sort of in the doctor's chair and he sat as the observer and he let me run the consultation. (GP8)

The opinions of doctors and other professionals met during medical school are also important. There were many comments on how general practice is perceived as an inferior choice of career, in particular there being an often negative view of general practice expressed during hospital training.

I guess during my resident years I was steered away from really entering a career in general practice because general practice was somehow seen as a somewhat of an inferior type of choice to choose as a practice as a career. (GPR1)

...in general it was seen as oh this is what you do if you can't get into anything else. (GPR2)

The trouble is being exposed to the teaching hospitals you see a very jaundiced view of general practice as if GPs all GPs just refer anything that's complicated and then sit there treating coughs and colds. (GP6)

I feel like they don't get a lot of respect from the rest of the medical profession especially from what I've seen in my clinical exposure in hospitals certainly a lot of specialists don't have a lot of time for GPs. (MS7)

To help counter this, exposure to quality general practice experiences will help students consider it as a career choice and give them realistic expectations of the job rather than counting on other people's opinions as to what being a generalist entails. Conversely a poorly rated GP attachment is harmful to a student's perception.

What will make general practice more attractive is if they have a more realistic expectation of what a career in medicine and a career in general practice and a career full stop entails and a more realistic understanding of what the word vocation means um that will make general practice much more attractive. (GP4)

Yeah I think overall I've probably when I started med I wasn't thinking that seriously about GP I was probably just thinking more of the glory ...but my exposure to it has probably made it seem like a much more positive career choice with flexibility and variety and the chance to actually make a real difference to people. (MS7)

I mean if they go with a bad GP whose depressed, alcoholic and thinking of killing himself because he hates his job and hates himself that's not going to help. (GP1)

People who had negative GP placement experiences then went on and chose not to do general practice. So it helps people decide. (GP3).

PGPPP

The postgraduate general practice placements program (PGPPP) has been running for two years. This program gives PGY1 and PGY2 doctors an opportunity to work in general practice for four months during an otherwise hospital-based year. The emerging evidence of its effects on career choice was confirmed by those interviewees involved in the process. However the number of interviewees with experience was small.

I wasn't very seriously considering general practice as a long term career but once I did it as an intern kind of it moved up my list of preferences if that makes sense. (JHO4)

And I found that you know I've learn a lot and it was a good rotation as well but you know not many people knows about it and not many you know publicity has been given into it. (JHO1)

Well I think that for the ones that have come through the program so far there's been a definite shift toward choosing general practice as a career. (GP12)

There's been a couple a very notable one actually who came in absolutely not wanting to do general practice and was all set up to do another career altogether and then has said no this is what I want to do and gone onto the GP pathways. (GP12)

Others who've come in knowing they didn't want to do general practice and that hasn't changed but have gone out thinking very differently about general practice so I think overall it's been very positive. (GP12)

THE ATTRACTIONS OF GENERAL PRACTICE AS CAREER

By advertising the factors that make general practice attractive more students and doctors may choose general practice. All the GPs interviewed were happy with their chosen career (this may in part be due to the self-selection of the interviewees) and gave reasons for this. These included the nature of the job itself such as continuity of care, working in the community, the variety of patients and conditions seen, the stimulation arising from the patient-doctor interactions, the skill mix needed and the ability to practise holistic care. The other factors related to the process of practice, for example the lifestyle, the prestige given to GPs and the possible autonomy of practice. Many doctors, both in training and experienced GPs mentioned the importance of flexibility of the working hours and career path as an important positive aspect of general practice.

And what's worthwhile about general practice is that you build long term meaningful relationships with patients through spending time together. (GP4)

I enjoyed a whole range of medical interests and I would have found that just concentrating on one particular area of, of medical practice would be a little bit restricting or constricting. (GPR1)

It appeals mainly because of lifestyle issues because I want to have a family (MS3)

I didn't seek a career in general practice I started off as a surgical trainee but after a year of doing surgery and watching what surgeons did I decided that that was a terrible life style to have for the rest of my life and decided to join the general practice training program instead (GP10)

I also like the lifestyle of it so it's more of a regular job than the strange hours that you get from hospital work (MS6)

Flexible working hours (GP8)

If you are in an appropriate environment you're able to be reasonable procedural as well so yeah which appeals to me I'm a kind of hands on person (MS8)

MAKING GENERAL PRACTICE EVEN MORE ATTRACTIVE

Having thought about the attractions as a career, the interviewees were able to make suggestions as to how to make general practice even more attractive. The suggestions varied between the qualified doctors and the students, obviously relating to the nature of their experience of the job. Doctors want less government interference, more collegiality, better communication with other GPs and greater recognition of their role. Greater flexibility, including flexibility of the vocational training program, and support are also important. Both groups mentioned pay and being able to do procedures.

Obviously being able to earn enough income that it should be relatively comparable to that which doctors earn in other areas, would be a help (GP1)

That is how I would, would like to see that general practice achieve some degree of I guess status amongst our medical colleagues and attracts high quality doctors to join the ranks as GP registrars. (GPR1)

For instance the authority system for pharmaceutical prescribing is done ostensibly for health reasons but it's not it's for budgetary reasons. (GP7)

Setting up a practice, assisting with administrative things if these things in place where it wasn't just me running a business or having to make sure everything is running you know where I was principally doing the job of a doctor and not an administrator and a small business owner then I think there would be more incentive (MS1)

If the training program was a lot simpler. (GPR3)

WHAT MAKES GENERAL PRACTICE UNATTRACTIVE

The factors mentioned here included lack of support, lack of time with patients and the decreasing prestige of general practice as a career path. Students cited the fact that general practice is not seen as a specialty and that it is not intellectually challenging. Negative role models and negative media coverage enhance the view of general practice as a poor choice.

I know that you know most specialties the amount of time you can spend with a patient is restrictive but I felt particularly in general practice often that the time really was limited and you often couldn't spend as long with a patient as the patient really needed or you wanted to spend with them. (MS10)

I think it could help if the profession talked publicly and privately about the positive aspects of the career instead of a relentless focus on the negative aspects of the job (GP13)

Mass media when ever there is a discussion about health matters the image on television is usually of an operating theatre as if it's the only place that matters that important work gets done there. I think there is a public image aspect to this. (GP1)

I didn't find it very intellectually stimulating and I think after the first when I got my fellowship my response to myself was you know gosh if this is the pinnacle of my academic life you've just got to be kidding this is not the only thing I do for the next twenty years it wasn't challenging enough in that sense. (MS1)

GENERAL PRACTITIONERS AS TEACHERS

Given the obvious importance of good GP role models mentioned by many interviewees, there is an obvious need for good GP teachers. GPs are drawn to teaching because it is enjoyable and it increases their status. However there is dissatisfaction about the level of remuneration. Moreover GPs feel they are not trained to teach.

Because we think it's our duty to help train future doctors (GP1)

I enjoy having them you know you know I enjoy having students you know it's, it's intellectually challenging sometimes demanding but yeah I don't mind having students but you know the initial motivation was because one has no choice in these things it's a moral obligation (GP4)

But I have to admit it is very onerous I've actually pulled out of some of the attachments that I've said I would do this year just because it is too onerous and the remuneration is appalling. (GP6)

I really think they need to be paid properly because at the moment there is it provides an altruism of the general practitioners to take medical students and with number of medical students coming out and the you know competition for clinical trainers from overseas trained doctors community residents, and registrars, you know people the right sort of people will be switched off and your gonna be left with you know people who you probably don't want doing GP supervision undergraduate and pre vocational years. (GP6)

We've had both medical students and registrars the general feeling has been that its part of the process and you learn as much as you teach in having medical students and where it's an environment that's geared around doing that everybody generally finds it positive for the patients through the students through the doctors. (GP13)

I think our practice has a higher status amongst patients because they think that we teach medical students. (GP9)

RURAL GENERAL PRACTICE

All the current medical students undergo rural attachments and these are usually enjoyable. However the positive aspects of rural practice need to be advertised.

To junior doctors the first thing is if the rural GP's would stop you know self flagellating and trying to tell everyone that you have to be a super doctor before you can go out there. (GP5)

Rural doctors and rural patients act differently than their city counterparts so in part the appeal of the rural GP term was possibly that it was rural but also I think I saw things about general practice that I hadn't, that I hadn't realized were part of it. (MS8)

Certainly the rural practice term was very positive cause it really showed the variety of interests that you could have (GPR1)

And what I've heard from some people that some of the rural areas you don't really get much support at all and you know you're sort of be working continuously and not having any breaks at all...and then 10 years is a long time as well actually. (JHO1)

Rural general practice presented a more positive aspect as a career choice for some students compared to urban experiences.

The suburban one really didn't, didn't really turn me on to GP at all that was there were a variety of reasons for that but like I said my rural experience was fantastic (MS8)

And there were a lot of really positive things that I took away from that placement I felt the GP's were fantastic the way that the community accepted the fact that there were junior doctors there providing their care and you know the respect that they showed you were all really positive experiences. (GP13)

THE RELEVANCE OF TEAMWORK

Most of the respondents thought that the ability to work with a interprofessional team would enhance working in general practice, as long as the GP's role was not diminished. The practising doctors were working in teams, and this is seen as a good support mechanism. However there was a feeling that students and junior doctors lacked training in teamwork.

I'm working in a multi disciplinary team at the moment and that is why I have chosen to be where I am because I like working in a multi disciplinary team. (GP3)

But I don't know that doctors are really taught how to work in a team (GPR2)

I mean I'm interested in more holistic care I like the idea of having experts on hand in other areas and it would be good to be able to offer more services to patients I think and have really good close communication with the other people involved in their care. (MS7)

I do believe the GP should still be the lead, the doctor should be the leader of the team because I think the one thing we were trained pretty well at is diagnosing and you know we sort of seem to have to take the legal responsibility but I do like I love working cooperatively with other (GP11)

It's a kind of sharing out appropriate skills and I really like that and I like the sense of support from a multidisciplinary team and within that idea of multidisciplinary I'd certainly include other GP colleagues because we were able to develop areas of expertise but rely on each other for help in an area we may not know so much about and then you just call in your colleague and sort it out that way. (GP12)

SUMMARY OF FACTORS THAT MAY BE INFLUENCED AND POSSIBLE STRATEGIES

Table 9 is a synthesis of the evidence from all sources.

Table 9 Factors affecting choice and possible actions

Factors	Action	For	Against/Problems
<i>Pre-selection</i>			
School programs	Outreach programs on medical careers	Unlikely to have negative effects	Evidence equivocal that these work Who to target and when?
Selection – nature	Positive discrimination for: Female students History of community service Rural background Older	Evidence that these factors affect career intentions	Many people do not feel comfortable with positive discrimination More females entering medicine anyway
Career choice at entry	Choose those stating preference for general practice/rural practice	Evidence that this predicts final career choice	Potential students may not be honest Choice may not be made so early and is likely to change particularly in younger students
Academic ability	Preference to broad background not high achievers Less interest in research	Evidence for	General practice also needs a research base and prestige to be enhanced as academic specialty
Financial incentives	Bonded places Grants	Ties students into specific careers Reduces student debt which is a factor	Bonded places not popular Grants expensive
Graduate entry	Increase graduate entry places	Some evidence but patchy	Reduces choice Lengthens study time
<i>University – nurture</i>			
Clinical attachments	GP and rural: Earlier Longer Multiple Attention to quality and hands-on General practice electives	Evidence that these affect choice (and educationally sound experiences)	Need more GPs to host students Not all GP placements allow students to have hands-on experience Would need better funding model (and more money) Quality may suffer with increased quantity Reduced quality will have a negative effect Too much GP puts some students off
Rural attachments	Increase Enhance role of RCS	Evidence that have positive effect even in	May have negative effect if too long and

	Longer High quality	students without prior interest	compulsory
Staff/clinicians	Portray positive aspects of general practice Enhance prestige	Enhances satisfaction for potential and current GPs	
Role models	Increase numbers of faculty who are GPs (movement in this direction with increasing numbers of deans of medical schools who are GPs) Attract quality GPs to teach and host students	Enhance GPs' role in teaching and mentoring	Are there enough GPs? Cost Increasing number of medical students will put pressure on quality placement opportunities
Information about GP	Stress the factors that affect career choice: Diversity Flexibility Continuity of care Procedures	Quality GP attachments to demonstrate the GP's work and lifestyle These are factors that attract people to GP and should be stressed	Potentially not enough quality attachments that demonstrate these
Career counselling	Readily available and good quality needed	Desired by students and doctors	Cost and resources Time issues in overcrowded curriculum
<i>Prevocational</i>			
Clinical attachments	PGPPP more widely available – in year 1 and year 2	Evidence starting to show effects of these placements	Legal and cost implications Need more general practices
Career counselling	To be provided		Whose responsibility?
<i>Vocational</i>			
Selection for	Rural background	Overwhelming evidence of effect on choice	
Training	Flexible	Enhances attractiveness of GP training	Not all supervisors may be happy with part-time registrars
Teamwork	Training in	Evidence equivocal that interprofessional teamwork enhances attraction of GP – but certainly attractive to some	
Compulsory rural term	Mandatory for most GP registrars at present	Will affect choice for some who enjoy rural experience	May be negative as compulsory
<i>General practice</i>			
Remuneration	Increase to be in-line with specialists		Cost Potential that unsuitable

			doctors will enter general practice for remuneration rather than attractions of clinical practice
Hours	Flexible	Positive attraction	Need more doctors to cover same amount of work Worsens rather than improves workforce shortages
Prestige	Needs enhancing through word of mouth Research – more general practice researchers needed	Enhances attractiveness for those who want academic career	
Advertising	Media TV programs Positive comments by GPs	Students and doctors watch TV!	Needs to be realistic as well as exciting
Procedures	Training for and provision to carry out Insurance fees reduced	Enhances variety of GP	Current insurance premiums

POLICY IMPLICATIONS

The findings of this study have highlighted the following:

- There is a shortage of general practitioners (GPs) working within the Australian health care system and this mirrors similar shortages in health services of other developed countries. Such shortages are due to many factors including general practice becoming less popular as a career choice, the demographics and lifestyle aspirations of many medical students and junior doctors, and the increase in the primary health care needs of the population
- The new generation of doctors is looking for flexibility in training and work practice. In particular female doctors want and need to combine family commitments with patient care giving
- A shortage of GPs and other community-based health professionals will have profound effects on health service delivery at a time when the incidence of chronic diseases is rising
- There are many interrelated factors that affect choice of career for doctors and other health professionals. Some of these may be influenced and others are more difficult to change. These factors are broadly similar across the countries surveyed
- There are many points in the career choices of future medical graduates, where interventions to promote greater interest in general practice may be applied
- Australian medical schools tend to see their mission as graduating high quality doctors able to work as interns, but not focused on a particular pathway – though many medical schools, and especially newer medical schools, do have a specific remit to be cognizant of the needs of the communities they serve. Policy responses need to take account of these heterogeneities
- The increase in medical student numbers may affect the quality of the general practice experience unless adequate resources are available to ensure its continuing quality
- In relation to choice of rural practice, the papers strongly support the fact that students with a rural background who also have an inherent interest in primary care and who are subsequently exposed to continuous and quality learning experiences in rural practices preferentially choose a career in rural locations
- The PGPPP at this early stage appears to have a positive effect on career choice towards general practice, mirroring the effect in the UK

POLICY OPTIONS

Policies that seek to increase the number of medical practitioners committed to general practice, especially in rural settings, will take into account the views of stakeholders including the deans of Australian medical schools, medical students, junior doctors, GP supervisors and GP registrars, Australian General Practice Training, the Divisions of General Practice, the Royal Australian College of General Practitioners and the Royal College of Nursing of Australia.

Daily reports confirm that increasing the general practice and community workforce, as well as the rural and remote health professional workforce, is important to patients. Federal and State governments are also concerned with the workforce problem. The policy options must be considered in the context of our findings, increasing medical student numbers, trends in working patterns and workforce projections.

These policies will need strong government support, both political and financial, in their development and implementation to ensure their effectiveness and sustainability. As we have shown, the current problems have arisen over decades and long-term changes in policy will need to be sustained, probably over similar periods, to achieve what we want as a nation by way of general practice for the future. We see government taking the lead in the development of appropriate policies, and making the ultimate resource allocation decisions that will enable them to be implemented. This is not to exclude others, either from the debate or from providing resources (for example, training support from professional and academic groups). But it is to say that we consider the government contribution to policy to be paramount.

A comprehensive policy response would have many elements. Below we identify several components, based upon our review of the evidence concerning strategies that work in improving recruitment to general practice. We put these forward for consideration by those who will be charged with developing the policy referred to in the preceding paragraph.

MEDICAL AND HEALTH PROFESSIONAL SCHOOL SELECTION PROCESSES

- Consideration should be given to providing additional incentives to those medical schools that choose to ensure an agreed percentage of their graduates enter general practice and/or practice in rural communities. We acknowledge that not all schools have similar objectives in respect of their graduates and that negotiations will be necessary with the deans of faculties to discuss their commitment and action in respect of workforce needs
- Because students from rural backgrounds are more likely to practise there, consideration could also be given to funding more support for entry by students from rural backgrounds to all health professional programs would likely increase numbers of health professionals choosing to work in rural areas following graduation. This support could take the form of scholarships

Process: Negotiations would need to occur between medical school deans and DEST to agree the funding amount to medical schools in respect of the percentage of graduates who take up general practice vocational training places above the current lowest percentage of 12.2%. Only those medical schools that see as part of their mission to increase the primary care workforce will need to be involved in these negotiations.

A restricted student 'grant' system should be introduced – payments to students of rural background entering health professional education including medicine. These grants should not be bonded but in recognition of the fact that rural background is a major factor in future workforce choice.

UNIVERSITY PROCESSES THROUGH NURTURE

- Those developing the policy might also consider the value of making additional resources available at the time of reaccreditation of all medical schools through the Australian Medical Council, so that medical schools will be able to provide counseling on career choices including in general practice and other aspects of community and rural medical practice
- Medical schools should be encouraged to increase the number of GP teachers/academics involved in teaching their medical students. Such people act as positive role models and should be encouraged to mentor students and junior doctors during training

Process: The development of career counseling services will require national support and co-ordination. A DEST funded national co-coordinating body would be able to provide the necessary resources such as a central information electronic portal, national information on career opportunities, career planning tools and materials and training of the career advisers (for further suggestions in regard to career counselling see Jackson et al¹⁴¹).

National support might be directed to the employment of a suitable person at lecturer level within a relevant department (possibly Medical Education Unit or similar) to be trained as career counselor. This post might be combined with research activity into career choice and workforce issues, costing all up about \$150,000 per medical school each year.

There are not enough high profile academic GPs and, as a discipline, GPs are underrepresented in medical schools⁴¹. There will need to be discussion between heads of departments of general practice on ways in which to enhance the academic standing of the discipline – for example research output with obvious benefits for patient outcomes, peer-referenced publications and grant awards. Current academic achievements should be advertised to students and students should be encouraged to carry out honours projects within the departments. Additional academic general practitioners to be employed by medical schools as necessary to match the proportion of academics within other departments – costs would be related to academic levels for example, one at associate professor level and one at senior lecturer level at total cost about \$230K.

To be able to provide such academic support and for the future of academic general practice, there needs to be a stronger ethos of nurturing GP academics for research and education. Without academics from the new generations of GPs there will be no possibility of providing the necessary academic growth. This could be done by incentives to encourage GP registrars to apply for academic GP registrar posts based within university departments of general practice, with a goal of having a minimum two such posts filled per medical school, feeding in from the local regional training provider (RTP). This also directly links GP training to medical student programs as an example of vertical integration. Such links are not always strong as RTPs are no longer partnered with universities. At present General Practice Education and Training (GPET) offers competitive funding equivalent to six months of a one year advanced academic registrar post – the annual salary is approximately \$74000. Registrars are expected to work for at least three sessions a week in general practice, to make up this full amount. Ten such posts are funded twice a year. Therefore an additional ten posts would need creating and funding at a cost of \$370 000 per year (ten times the six month salary).

FUNDING MODELS FOR CLINICAL PLACEMENTS

- Enhanced government funding is required to provide longer and better supported placements in general practice and rural practice for all medical students
- To attract more GP role models and recruit more practices to train medical students, especially as the number of medical students rises, greater resources and supports should be provided to develop teaching general practices. This includes payments for teaching that compensates practitioners for income lost from patient care while teaching. Additional consulting rooms are needed so that both medical students and

junior doctors can see patients in their own space. Teaching excellence should be recognised with a merit award system

- Additional resources should be provided to encourage GPs to host junior doctors through the PGPPP (postgraduate general practice placement program) – a general practice attachment should be mandatory and available for all junior doctors in either PGY1 or PGY2. With the extension of medical student numbers, there will need to be a corresponding increase in intern posts and a proportion of these could be in general practice
- Barriers preventing the development of PGPPP placements in some parts of Australia should be identified and where possible broken down. At present the major barrier is within NSW as NSW Health is having difficulties in relation to indemnity as junior doctors are employed through NSW Health and yet are spending part of their training time in the community. It is likely that this problem will be resolved as NSW Health falls into line with other state health boards. Other issues are related to space and time for junior doctors within general practices. The RACGP is promoting the extension of the PGPPP system and would be a major stakeholder and partner with this policy
- Australian government funding of new community clinical schools in each medical school, as recommended by the Australian General Practice summit and along similar lines to funding provided for rural clinical schools, would provide a substantial increase in the quality and quantity of general practice exposure provided to medical students and junior doctors and will have an impact on their ability to make informed choices about their future careers

Process: The current funding model of PIP (practice incentive payments) at \$100 per GP teaching session within general practice is not adequate to recompense GPs for remuneration lost due to teaching. We would advocate a payment of \$58000 per practice per student per year. (This figure is twice the amount payable per year for an intern in general practice on the PGPPP and represents the extra work of supervision required for students.) GPs to enter into contracts with medical schools to provide placements for students for 46 weeks per year with agreed learning activities, including senior students having their own patient consultations with supervision and feedback. There would also be payments to appropriate general practices to build supporting infrastructure such as an extra consulting room for students (and PGPPP doctors), tied into a ten year contract to provide educational services. Such payments would depend upon the cost of building but would start at \$10000 per practice. Funding to practices would be decided by a designated group of stakeholders through a system of grants with practices giving reasons for the necessary expenditure. Some practices may need different kinds of resources rather than room space, such as computers or library facilities. Teaching practices would be deemed appropriate through accreditation processes agreed by medical schools, the RACGP and ACRRM. Practices who receive such resources would also contract to undertake annual evaluation and quality assurance of their educational provision and to meet standards developed by the RACGP in partnership with University Departments of General Practice.

Federal government resources to be made available to work towards a target of 50% of PGY1 or PGY2 doctors to undertake a PGPPP rotation within ten years. (The percentage of similar level doctors in the UK undertaking such rotations is 55%.)

Such a target would need agreement by state health boards. At present there are approximately 140 practices offering PGPPP within Australia. The numbers of medical graduates entering the workforce is predicted to be 3000 within the next ten years. If 1000 of these graduates are to undertake PGPPP in five years, increasing to 1500 in ten years the costs will be approximately \$10 million and \$15 million respectively per annum. This cost relates to each doctor undertaking a four month rotation in general practice with payments to GP supervisors of \$29000 per annum (3 junior doctors per year.)

Successful outcomes for these processes would be related to increases in the proportion of medical students/junior doctors entering general practice compared to the current figures of between 12.2% and 27% (lowest and highest medical schools – see page 7).

An integrated model of general practice education, linking medical students, with junior doctors and then GP registrars would be best delivered through community clinical schools as recommended in the document produced after the GP Education Summit of July 2007.²⁰⁵ Funding needs to be established through DEST. A working party needs to be established with DEST funding, with membership of stakeholders including medical schools (and their Departments of General Practice), representatives from the two colleges (RACGP and ACCRM), AGPT, GPRA and AMSA. As such community clinical schools could also become venues for practice nurse training (and prequalification nurse training), representatives from the RCN, the Practice Nurse Association and Faculties of Nursing should also be members.

Rural clinical schools have been set up at federal government cost of \$4.5 million with state governments often contributing a similar amount. We would expect community clinical schools to be less costly as student accommodation would not be necessary in urban areas as students will already have access to housing. We would like to see in line with the RCS that 25% of medical students will eventually undertake a one year community placement for example similar to the Riverlands project of Flinders University and those planned for the University of Wollongong and University of Western Sydney medical schools, but set in both urban, suburban and rural settings.

GENERAL PRACTICE AS A CAREER CHOICE – ENHANCING THE FACTORS THAT MAKE GENERAL PRACTICE ATTRACTIVE

- General practice as a career should offer flexible training opportunities and flexible working hours
- The Medicare payment structure should be altered to allow properly educated and supported general practice nurses greater autonomy to see and treat patients, with a general practice nurse career development pathway and a national payment structure

Process: Part-time training is already possible through GPET. Due to the nature of general practice remuneration there is no funding for maternity leave and other incentives to recruit and retain women within the workforce. Policy makers may wish to consider the possibility of developing salaried general practice positions that offer job security and regular remuneration for those doctors that wish to work in this way, rather than in private general practices. Such doctors would be employed in community clinics or clinical schools and receive a fixed income rather than Medicare payments directly. (This model would be similar to that in the UK where there is an increasing number of salaried GPs as well as private self-employed profit-sharing GPs). This scheme could be piloted and its success measured by recruitment and retention data.

Proposed changes to the Medicare payments scheme will need to be discussed with the Department of Health and Ageing (DOHA), for the establishment of more Medicare item numbers for practice nurse delivery so that nurses may see selected and appropriate patients without prior doctor involvement. For example nurses to provide health promotion, immunization, chronic disease management and treatment of minor illness. Funding is also required for practice nurse training – trainee practice nurses to be attached to accredited training practices under the supervision of experienced nurses as supervisors, with supervision payment to the practice for such service similar to payments for GP registrar supervision.

The salary of the trainee practice nurse should be met part by the practice and part by the nurse training provider organisation within each region. This provider could be linked to the GP RTP as a model of interprofessional education.

This process would find favour with the RCN and probably the RACGP, but would need careful negotiation with Australian Medical Association and grassroots GPs who may feel their professional roles to be undermined.

TEAMWORK, PRIMARY CARE AND INTERPROFESSIONAL PRACTICE

- More research is required into the effects of teamwork in general practice/primary care in Australia. Teamwork enhances the attractions of work in general practice/primary care for many health professionals

Process: Competitive grant monies to be made available through DEST and DOHA for research into the effects and outcomes of interprofessional teamwork within community settings in terms of patient outcomes, job satisfaction, recruitment and retention.

APPENDICES

APPENDIX 1: SEARCH STRATEGY

Question i.

The initial search was through Medline with the following keywords to get a flavour of the literature:

Career choice in medicine; general practice workforce; general practice career choice; general practice as a career. This yielded 34 papers of which 23 were relevant.

The next search was through MESH term family practice: focus search on education, manpower, trends, utilization (7376 citations); combined with career choice: focus search (210 retrieved, 111 relevant): 134 relevant papers.

Papers were excluded at this stage if they did not address the above questions for the following reasons:

- Not focussed on general practice/primary care ie other career choices of specialty predominant focus of paper
- More focussed on research on other aspects of general practice
- Focussed on general practice as a concept rather than a career choice
- Other workforce issues rather than recruitment, in particular we excluded papers that dealt solely with retention, rather than recruitment and retention.

Further papers were retrieved from reading these articles. We also searched the following databases: RURAL: Rural and Remote Health Database; AMI: Australasian Medical Index via Meditext and the Cochrane database. This added a further 65 papers giving 199 in total. We decided to concentrate on papers published after 2000 and read these in full; we read the abstracts for earlier papers and retrieved the full publications if of major interest or a literature review. At this stage we rejected 80 papers on the basis of year, nothing new to add, too localised within a country, letter only. This gave a total of 101 papers out of 309 read.

Question iii.

Search on: (Multidisciplinary OR Interdisciplinary OR Interprofessional OR Multiprofessional) AND Teams) OR Teamwork OR Education): **363717**

(Primary care OR General practice OR Primary health care OR Family medicine): **80796**

Career choice: **11013**

(Medical students OR Interns OR Pre-registration house officers OR General practice registrars OR Family medicine residents OR Junior doctors).mp = **14539**

Combination of the above: **123**

Papers were excluded at this stage if did not address the above questions for the following reasons (based on review of abstract):

- Not focussed on general practice/primary care: i.e. other career choices of specialty
- Not focused directly on factors involved in choosing primary care as career or factor having other influence on career choice
- Ie – overall report of medical student demographics; attitudes towards GP psychosocial interaction;
- Articles dated prior to 1990

After exclusions and removal of duplicates from other searches, this yielded **27** papers.

Question iv.

Keyword searches on: rural clinical schools; rural workforce; rural attachments; rural placements, giving **11** relevant papers, after removing duplications from 48.

Question ii.

Keyword searches and combinations of: medical students; *Career Choice/; *Family Practice/ma and *Family Practice/ed and *Family Practice/td OR *Family Practice/; general practice; junior doctors; interns; (general practice registrars or family medicine residents); general practice placements; general practice attachments; community placements; Medical student numbers. This gave an additional **10** papers as many were duplicates from previous searches or not relevant (from 33 papers).

Total from these searches of the four questions was **149** citations.

Additional sources

In addition to the papers retrieved through the above searches we found papers and grey literature through contacts at the College of Family Physicians of Canada, the Royal New Zealand College of GPs, the RACGP, the RCGP (UK) and through the Network/Towards Unity for Health (an international community-orientated organisation of health professional education institutions), plus web alerts of new papers. This led to a further 49 references, including one website, 15 documents from the grey literature and 32 papers.

This led to a total of **198 citations** in the research database.

APPENDIX 2: THE AMERICAN LITERATURE REVIEWS

	Meurer 1995 ³³	Campos-Outcalt et al, 1995 ²⁸	Bland(a) et al, 1995 ²⁶	Senf et al, 2003 ³⁴
Databases	Medline PsychInfo	Medline PsychInfo Current Contents Academic Index	Medline PsychInfo Sociology Abstracts Educational Resource Information Centre Dissertation abstracts	Medline PsychInfo HealthSTAR Expanded Academic Index Health and Psychosocial Instruments
Years reviewed	82-April 93	84-93	87-93	93-2001
Types of studies: focus of review	Studies comparing the presence of curricular programs or student characteristics with primary care choices by US medical school graduates	1. Effects of biomedical research funds on medical school curricula, faculty composition and generalist choice of students 2. Effects of medical school curricula on generalist choices 3. Effects of faculty role models on generalist choices	1. Factors that may predict or influence generalist choice of graduating students 2. Relationships between the factors and how they exert their influence	Original research related to a choice of family medicine as a specialty
Number of studies	150 29 analysed (prospective only)	275 85 analysed	307 108 analysed	150 36 analysed
Scoring system for papers	None	Out of 70	Out of 100	Out of 70 (C-O scoring)

APPENDIX 3: THE FOUR AMERICAN LITERATURE REVIEWS – FACTORS INFLUENCING CAREER CHOICE

In this table the factors listed are those that make a student more likely to enter a primary care career (including family medicine). Factors in italics are those that make a student less likely. If a factor is missing from a column – there is no evidence in that review either way.

	Bland(a) et al, 1995 ²⁶	Meurer 1995 ³³	Campos-Outcalt et al, 1995 ²⁸	Senf et al, 2003 ³⁴
Gender	Female			(Inconsistent relationship with being female)
Age	Older students	Older students		Older students
Ethnicity				Hispanic
Socioeconomic status	<i>Doctor parents</i>	<i>Doctor parents</i>		Parents with lower income or education
Marital status	Married	Married		
Background	Rural	Rural		Rural
Academic background	Broad	Behavioural science or liberal arts		
Values		Low income expectations		Low income expectations Agreement that PC doctors are more important than specialists
Career intentions on entry	<i>Primary care intentions disappear over course of medical school</i>	Primary care intentions disappear over course of medical school		Primary care BUT Primary care intentions disappear over course of medical school
School factors	Public ownership	Public ownership		Public ownership
Department	Having a dept of FM			
Research funding	(Mixed results)		<i>Amount of funding</i>	
Special programs (FM)	Longitudinal	Multiple supports for and experience with primary care	Are related to specialty choice but not clear what is important.	Are related to specialty choice but not clear what is important.
Primary care climate				<i>Negative comments by clinicians/Faculty</i>
3 rd and 4 th year curricula	Required time	Required time	Required time	Required time
Faculty staff	Proportion of Faculty who are in family medicine		Proportion of Faculty who are in family medicine	
Role models				+ve role models -ve role models

Outcomes				
Debt		Large debt or no debt		
Knowledge of content				<i>Perceptions of lack of prestige + low intellectual content</i>
Career intentions				Intended rural/underserved practice <i>Interest in research/academic career</i>

APPENDIX 4: AUSTRALIAN PAPERS SCORED WITH C-O SYSTEM²⁸ AND CURRAN²⁵ CLASSIFIED

Author	Year	Method	Subjects	C-O score	Curran Classification
AMWAC ¹³	2003	Survey	Vocational training residents	24	2
AMWAC ⁷²	2005	Survey	Vocational training residents	28	2
Armitage et al ⁷⁹	2000	Survey	Nursing students	11	2
Azer et al ⁷¹	2001	Survey	Medical students	16	3
Charles et al ⁷⁵	2005	Survey	GPRs	14	3
Critchley et al ⁶⁸	2007	Survey	Medical students	27	2
Courtney et al ⁸²	2002	Survey	Nursing	24	4
Crowe et al ⁸⁴	2002	Focus group/Survey	OT students - final yr - 2 NSW schools	12	2
Denz-Penhey et al ⁵⁷	2005	Evaluation through surveys and interviews	Medical students at rural clinical schools	9	2
Dunbadin et al ⁶²	2006	Survey	Doctors	36	3
Eley et al ⁵⁸	2006	Survey	Medical students	25	2
Harris et al ⁷³	2005	Survey	Graduates/doctors	30	2
Jones et al ⁵⁹	2005	Survey	Medical students	10	2
Joyce et al ⁵	2006	Survey	Graduates/doctors	27	2
Joyce et al ¹²	2006	Survey	Graduates/doctors	42	2
Laurence et al ⁴⁶	2007	Interviews	Junior doctors	2	2
Lea et al ⁷⁸	2005	Interviews	Graduate nurses in nurse transition programs (entering rural practice)	6	2
McAllister et al ⁶¹	1998	Analysis of student reports	Health professional students after rural attachments	5	2
McNair et al ⁸⁶	2005	Evaluation through questionnaires	Medical, nursing, physiotherapy and pharmacy students	17	3
Newbury et al ⁶⁴	2005	Survey	Medical students	19	2

Nichols et al; ⁷⁴	2004	Survey/interviews	Junior doctors	28	2
Orpin et al ⁶⁵	2005	Survey	Health professional students	12	3
Playford et al ⁸¹	2006	Survey	Allied health and nurses	40	2
Searle et al ⁴⁴	2007	Survey - pilot	Medical students	15	3
Shanley et al ⁵¹	2002	Survey	GP registrars	32	2
Smith et al ⁸³	2001	Survey	Nursing students - final year	16	3
Somers et al ⁷⁰	2007	Survey	Medical students	30	4
Somers et al ⁴⁵	2001	Survey/Data Review	1st year med students and rural GPs	23	2
Talbot et al ⁶⁶	2000	Survey	Medical students	26	2
Tolhurst et al ⁶⁷	2006	Qualitative	Medical students	15	3
Tolhurst et al ³⁹	2005	Qualitative	Medical students, schools	15	2
Veitch et al ⁴²	2006	Survey	Medical students	20	2
Wainer ⁷⁶	2004	Survey	Female GPs	20	2
Wainer et al ⁷⁷	2004	Survey	Male and female GPs	35	3
Wilkinson et al ⁵⁵	2004	Time analysis of intern preferences	Medical students	23	3
Wright et al ⁴³	2006	Survey	Medical students	39	2

APPENDIX 5: SUMMARY OF REFERENCES CITED EXCLUDING LITERATURE REVIEWS (TABLE 3) AND AUSTRALIAN RESEARCH PAPERS (APPENDIX 4)

Authors (Year)	Country	Type of Study	Curran classifn	Participants / Numbers / Response Rate	Results / Factors	Comments + relevance to Australia
AGPT (2007) ³	Australia	Workforce report	2		Trends in application for general practice	
Ali et al (2003) ¹¹³	UK	Letter re survey	2	Medical students 479 (RR 79.8%)	Increased preference for GP career after GP exposure	Perceptions of GP pay and lifestyle had no associations with career choice
Allen (2005) ⁸	UK	Debate	1		Figures relating to women in the workforce and decreased proportion working full-time	Importance of role models and mentors for female doctors
AMWAC 2003 ¹³ or 2005 ⁷²	Australia	Workforce review	2			
ARRWAG (2006) ⁵⁶	Australia	Report and review of data	2	Report for DEST	Rural schools – appear to increase rural choice but is this the effect of the school or selection? (ie choices don't change)	Looking at educational value of rural schools. Suggest: Extend duration of rural placements, Vertical integration with shared workforce vision Promote GP as specialty Quality training and assessment Indigenous content
Avgerinos et al. (2006) ¹⁰⁵	Greece	Survey	2	650 clinical and pre-clinical students at 4 of 7 medical schools in Greece, RR = 90.9%	97.6% of respondents want to specialize; 1.7% of respondents had GP as their first preference	Scientific challenge and interaction with patients most important factors in choice
Basco (1998) ⁸⁹	USA	Cross-sectional, secondary analyses of databases from AAMC	3	120 medical schools (95%) completed the AAMC's Survey of Generalist Physician Initiatives in either 1993 or 1994; 94% of matriculants replied to the AAMC's 1994 Matriculating Student Questionnaire.	25% of the schools had admission committees who were generalists, half had over 25% generalists on their admission committees, 64% gave admission preference to students likely to become generalists, and 33% reported premedical recruitment efforts that targeted applicants likely to become generalists.	Premedical recruitment efforts and public school ownership were associated with greater interest of matriculants in both generalism and rural medicine.

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Beaulieu et al (2005) ⁴⁸	Canada	Survey and qualitative interviews	2	Residents and Faculties of Medicine Survey – no data 40 interviews with 91 participants	Collaboration between hospital specialists and GPs and effects on practice and attitudes to GP. Specialists see GP training as 'at a discount' as they are not aware of the training that GPs receive	Highlights gulf between hospital doctors and GPs in Canada. Specialist attitude impacts on doctors' choice of residency Recommend need change within the academic community to increase collaboration. Also emphasise need for GPs to create new practice models involving working in teams.
Beaulieu et al (2006) ¹¹⁸	Canada	Focus groups in Europe	2	GP registrars about to enter workforce – 28 doctors, 5 groups (92 asked)	Valued family orientation of family medicine and continuity of care	Did not like business side of GP or gatekeeper role Want flexible working patterns – correlates with Australian data
Berg et al (2006) ⁹⁸	USA	Analysis of the American Medical Association Physician Masterfile in relation to one medical school (examining physician-to-population ratios, rural-urban geographic distribution, physician demographics, and physician graduation)	2	Methods fully described in <i>WWAMI Physician Workforce 2005</i>	A medical school needs a clear mission to train for its local workforce needs	Suggestions to increase family medicine choice Look at admission policy Develop pathway in primary care Curriculum to include professionalism including dealing with the problem of disrespect for specialty choice that especially disadvantages PC 'a publicly supported med school should aim to meet the needs of its regions in terms of the physician workforce'
Bethune et al (2007) ¹¹⁰	Canada	Quantitative survey of each class of medical students at 5 points 1999 to 2006	2	Variable RR over years from 11% to 89%	Carried out in response to lower numbers applying for FM. Many considered FM at early stage and changed mind	Speculation that new Dean and introduction of FM course in yr 2 has started to increase numbers Need to understand how UG program affects career choice
Block et al (1996) ¹⁰⁶	USA	Descriptive study using telephone interviews	2	2293 participants (national stratified probability samples - 1st and 4th	Respondents generally perceived: primary care (PC) tasks don't require high	Data over ten years old but similar to other studies Large numbers

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				year medical students, residents, clinical faculty, internal medicine and pediatrics residency training directors and chairs, and deans; response rate was 84%.	levels of expertise; nearly 50% believe that generalists aren't the best physicians to manage patients with serious illness and the quality of PC research is inferior to that in other fields. Learners perceived less encouragement for generalist careers and negative attitudes toward generalists among faculty, and view the quality of their PC training as inferior to that for specialty practice.	Highlights that change in values and attitudes towards primary care to recruit more students into field
Blue et al (2004) ¹⁸⁶	USA	Pre- and post-clerkship questionnaire	3	486 3rd year students were surveyed; response rate was 88%	Students were surveyed on their beliefs about primary care physicians practicing in rural communities vs those who live in urban/suburban areas. After a rural clerkship there was an increase in students' perceptions of rural PC physicians, PC service features and medical expertise. Students' perceived the physicians' work demands more positively. There was no change in students' perceptions of the physicians' income potential.	Results suggest that the rural PC clerkship positively influenced students' perceptions towards rural PC.
Bly (2006) ⁹⁰	Canada	An outreach program initiated by medical residents in the University of Alberta's Rural Alberta North Program implemented in rural and regional high	2	Schools in small towns and in the regional centre itself (Grande Prairie, pop 40000) were visited; school sizes ranged from 200 to 1500 students; A small number of students visited the Queen Elizabeth II Regional	Presenters can have a substantial influence on the students. 39/44 respondents noted that family doctors make less money, get more respect, and have more free time that surgeons, cardiologists, or pediatricians. Rural family	Small numbers reduce impact of this study. Shows in this group that attitudes to family practice are in place before medical school and that it is possible these could be affected by outreach programs.

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		schools in northern Alberta. Students were surveyed on their experience.		Hospital in Grande Prairie for a Career Day tour - 44 students attended in 2004 and 29 in 2005. Students were asked to complete a survey on their experience with the speaker series and hospital tour; There were only 44 respondents.	doctors were perceived to make less money, but get more respect, have more free time, and have a better job than their urban counterparts. The students fairly consistently rated small-town doctors as less intelligent than their urban colleagues. Early outreach offers hope for renewed vitality in family medicine and rural practice.	
Bodenheimer (2006) ¹⁶	USA	Discussion article	1			Opinions on why students not choosing family medicine are not directly linked to evidence. Of interest as suggests more team care.
Boex et al (1994) ¹²⁹	USA	Comparison of survey data from 1990 and 1992 to gain insight into how hospitals and/or programs offer incentives	2	522 teaching hospitals representing over 85% of all residency programs offering PG-year-one positions. Complementary data on students' experiences with recruitment incentives in 1991 and 1992 also analyzed their reactions to financial incentives they encountered.	Family practice, internal medicine and pediatrics were the specialties most likely to offer financial incentives; there is a wide range of recruitment incentives available to students; the proportion of hospitals / programs offering such incentives is increasing; a large number of students who encountered these incentives viewed them as at least somewhat effective in persuading them to consider matching with the programs that offered them.	Older paper but of interest as looked at financial incentives similar to bonding schemes. The authors comment that the prevalence and persuasiveness of financial incentives raise a number of serious questions - including whether competition for residents will divert funds from improving educational quality to recruitment.
Bowler et al (2002) ⁹	UK	Questionnaire of GP registrars	2	Postal questionnaire sent to 470 GP registrars in the Thames deaneries; 373 were returned; RR = 79%	92% of respondents in their final year of training; 60% female; 29% qualified overseas. 58% of respondents would prefer GP component of training be	30% of females and 75% of males to work full-time

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					extended by 6 to 18 months; 74% intended to take a GP job immediately after training; 26% intended to take a principalship (37% were men / 18% were women - significant difference).	
Bowman (2006) ³⁸	USA	Workforce data mapped against changes in health policy	1			Health policy has an impact on the number of people choosing family medicine / primary care choice.
Bowman (2007) ⁹⁷	USA	Editorial	1			Looks at income level and medical school intake – suggests change in policy for intake and early community experience/partnership
Brooks (2003) ⁴⁰	Australia	Letter	1			Calls for vertical integration between UG and PG medical education and increasing contact with general practice – need positive GP experience
Campos-Oucalt et al (2004) ⁹²	USA	Questionnaire	3	Physicians who entered a family medicine residency (1428) and a randomly selected equal number of graduates who entered other primary care specialties (1297). 12 medical schools with the largest proportionate increases in people entering family medicine and 12 medical schools with the largest proportionate decreases entering family medicine. The responses were compared. 1427 questionnaires were returned (RR = 51.5%);	Significant differences - the number of family medicine and primary care clinical rotations and students' perception of the clinical competence of the Family Medicine faculty was also important.	Well designed study Schools with increases in students going into Family Medicine did enrol more students with intent at the start. Again highlights importance of clinical placements

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Campos-Oucalt et al (2003) ¹¹¹	USA	Questionnaire	2	As above	The focus on negative comments with regard to family medicine. The frequency and content of negative comments was not related to increases or decreases in the proportion of students choosing family practice. Negative comments were heard more frequently about family practice than about other primary care specialties	The negative comments heard most often were that family physicians cannot master the content of a specialty and that they are not as smart as other physicians. However interesting that this did not appear to affect choice – though doctors were asked about this several years after making choice.
Canadian NPS (2007) ¹⁴⁰	Canada	Website	2	Doctors, medical students and residents on line survey – results from 2004 (2007 being conducted at present)	Rich information about workforce choices	Factors leading to GP career choice – 2 highest = intellectual stimulation and doctor-patient relationship
Carelli (2003) ¹¹²	Italy	Letter re survey	2	Students – no numbers given	Students have limited, confused and incorrect knowledge of GP Helped by attachments	Report of survey published in Italy Agrees with other findings about value of GP placements
Charles et al (2004) ⁷	Australia	Workforce data	2		Feminisation of workforce and increase in part-time working	Need to take into account changes in workforce demographics when planning for future
Ciechanowski et al (2004) ¹⁰²	USA	Questionnaire	2	144 yr 2 medical students from the University of Washington Medical School who attended a medical school orientation completed a questionnaire assessing attachment style, specialty choice and demographics.	Study to assess relationship styles based on attachment theory among medical students. Student attachment style was significantly correlated with choice of primary care or non-primary care. Students rating themselves as being more comfortable or secure in relationships choose primary care over non-primary care. Two of the attachment styles, which were associated with self-	May have implications for medical education and career counseling. Even students who have not started clinical training are aware to some degree about their level of comfort within relationships, and this appears to influence their choice of specialty. Instruments measuring attachment or relationship styles could be used as a valuable tool in providing counseling to students who may be uncertain about specialty choice (or even

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					reliance or avoidance of others and lack of trust of others, were significantly associated with the choice of non-primary care over primary care.	for student selection)
Clasen (2004) ¹¹⁴	USA	Letter re survey	2	Survey to 44 graduates (RR 54%) 2 hour interview with 10	Reasons not to choose primary care = managed care, too much knowledge over broad field	Also student debt a factor
Couper et al (2007) ¹⁸⁵	South Africa	Unpublished grey literature - interviews	2	15 healthcare professionals	Factors affecting choice of rural career. Complex interaction between large number of factors – those other than educational seem more important.	Small numbers but similar results
Del Mar et al (2003) ⁴⁷	Australia	Viewpoint	1		Suggest reasons for poor status of GPs: Less rare, expertise less deep (but broader), undervalue skills, poor in research and publishing, GPs poorly represented in universities. Not enough high profile GP academics	Solutions: ^ remuneration (unlikely) Fund-holding Professional autonomy Strengthen intellectual aspects – promote more and better critical thinking among GPs Involve in research Academic registrars positions <i>These are all speculation in the article but correspond to other commentators and evidence</i>
Dohn (1996) ²³	Denmark	Theoretical paper re career choices	1			
Dorsey et al (2003) ¹³⁷	USA	Determination of specialty preference of US senior medical students through analysis of results from 3 matching programs from '96 - '02.	2	Approx 15000 participants per year	Looked at proportion of variability in specialty preference explainable by controllable lifestyle. In the log-linear model, controllable lifestyle, as a factor alone, explained 37% of the variability in specialty preference from 1996 -	The increasing preference of US senior medical students for specialties with a controllable lifestyle has significant implications; a controllable lifestyle is one with control of work hours. In UUSA Family Practice is classified as having an uncontrollable lifestyle.

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					2002. Over the years, after controlling for income, work hours, and years in training, the percentage of variability accounted for by controllable lifestyle increased from 37% to 55%.	Yet in Australia and the UK general practice is now seen as more flexible in work choices.
Doucet et al (1999) ¹²⁵	USA	Survey	2	All 229 applicants interviewed residents' posts: response rate = 67.7%	Career choices made in Yr 2 and 3 Faculty role models important	Survey not piloted or validated
Easterbrook et al (1999) ¹⁸⁹	Canada	Survey re factors affecting choice of practice location	2	303 graduates of the Family Medicine Program at Kingston, Ontario. 230 responded, 71 were excluded from the analysis – though RR noted as 230/303 = 75.9%.	Physicians raised in rural communities were 2.3 times more likely than those from non-rural communities to choose to practise in a rural community immediately after graduation (95% CI 1.43 - 3.69, p = 0.001). There was no association between exposure to rural practice during UG or residency training and choosing to practice in a rural community.	There are implications for the selection of students into medical programs.
Ellsbury et al (2000) ²⁰⁰	USA	Analysis of American Medical Association master file data on 1988 - 1996 medical school graduates to identify the US medical schools most successful at producing rural family physician or GP grads.	2	Medical school graduates - 53 960 physicians from 122 medical schools	Graduates are more likely to choose a rural career if they are from publically funded medical schools or from the mid-section of the USA.	May have implications relating to private medical schools – but difficult to know how relates to Australian situation
Evans et al (2002) ¹⁰⁶	UK	Qualitative analysis of free text surveys	3	Qualitative analysis of free text surveys Surveys were carried out	Choice of GP was found to be influenced positively by: greater exposure to GP as	General practice as a lifestyle choice is highlighted once again in this paper

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				in a number of years and had the following respondents: 1974 - 1717; 1983 - 2718; 1988 - 2885; 1993 - 2732 (TOTAL - 10 052)	an UG and better quality hospital posts for Vocational Training Schemes; and negatively by: negative comments by hospital based staff that GP is a second class career and the low morale in general of GPs. Choice of GP was made for lifestyle reasons rather than professional aspirations	
Fields et al (1996) 133	USA	Telephone survey	3	The person responsible for the PBL program at 8 medical schools	The 8 schools having comprehensive PBL curricula were quite different from each other and the authors were unable to isolate the independent effects of the comprehensive PBL curricula on medical students' choice of generalist careers because these programs were more likely to be located in medical schools that had primary care or community-based missions.	Data from 1993 but only paper looking at educational delivery as factor in career choice
Future of Family Medicine Project Leadership Committee (2004) 153	USA	Interviews and focus groups identified key issues for diverse constituencies. Purpose to transform and renew the discipline of family medicine	2	A national independent research study of stakeholders	The project identified core values and the team created a New Model of practice with the following characteristics: a patient-centred team approach; elimination of barriers to access; advanced information systems, including an electronic health record; redesigned, more functional offices; a focus on quality and outcomes; and enhanced practice finance.	One challenge recognised was the need to make family medicine more attractive as a career option but the paper does not address how to do this.
Gazewood et al	USA	Retrospective cohort	3	489 medical students who	No significant relationship	This study found that the type

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(2002) ¹⁶⁴		study		completed the PCAM (primary care ambulatory medicine) clerkship and then graduated 1995 - 1998; 25 students excluded so 464 included in the analysis; 251 students assigned to family medicine and 213 assigned to general medicine.	between preceptor assignment and students' generalist career choice; those assigned to general internal medicine preceptors not more likely to choose careers in general internal medicine; students assigned to family medicine preceptors not more likely to select careers in family practice. Students were not asked about career choice prior to the study so it is not known if there was a change.	of generalist experience received during the 3rd year did not affect students' choice of a generalist career, nor did it influence their career choice between the generalist specialties. These findings conflict with many other studies – but retrospective and some years after medical school experience.
Goldacre et al (2004) ¹³⁰	UK	Questionnaire	2	8498 (4104 men and 4390 women) were sent surveys to determine choices of eventual career expressed 1 year after graduating, and factors influencing their choice; 5702 responded (RR = 67.1%)	In every medical school the 3 most frequently chosen broad specialties were general practice, hospital medicine and surgery. There were some significant differences between medical schools: choices for hospital medical and surgical specialties; the extent to which career choices had been strongly influenced by graduates' inclinations before starting medical school; and by their experience of their chosen specialty, particularly teachers and departments at medical school. As well as the differences, there were also many similarities between the schools in graduates' career choices.	Discussion based on conjecture from results: Applicants may select a medical school based on their understanding of its reputation in particular subjects; medical schools may select some candidates with particular interests or attributes associated with eventual specialty choice; during the student years some medical schools may place more emphasis on some specialties that may influence their graduates' career choices and the influence of individual teachers might also help to determine specialty choice; during the student years, impressions about careers in different specialties may be conveyed to students in different ways at different medical schools, thus moulding their intentions towards or

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						away from particular specialties.
Goldacre et al (2007) ¹⁵⁴	UK	Survey	3	Career preferences of graduate and non-graduate entrants to med schools in UK1999-2002 – data after qualification 65% RR – good numbers (from 13 088)	Modest differences between groups. The cohort three years after qualification showed a significant difference with 38% graduate entry versus 32% undergraduate. Female doctors were more likely to choose general practice from both groups.	For graduate entrants domestic factors were more important and this was particularly the case for those doctors who chose general practice. Highlights need for emphasizing GP as flexible working hours – may be of relevance in relation to graduate entry medical schools
Goodyear et al (2007) ¹⁵⁹	UK	Survey	2	841 junior doctors FY 1 or 2. 60% RR	Looks at sources and quality of career advice. Informal advice most common. Career choice more firm in FY2. Similar number choosing GP. More choosing GP than similar survey in 1995 (22% v 19%) - due more GP as student or new contract?	Career counseling important Recent figures from UK show some ^ in GP numbers – which could be related to changes in pay
Graham et al (2004) ¹⁴³	Ireland	A focus group convened to brainstorm issues followed by a questionnaire	2	200 Irish vocationally trained female general practitioners qualifying between 1995 and 2001; 134 were returned (RR = 67%)	The highest rated reasons for choosing general practice as a career were 'I always wanted to be a general practitioner' with 49% of first preferences, following this was that 'General practice is conducive with having a family' and thirdly the 'Possibility of working part-time'. 36% do not intend to remain in a full-time capacity with a further 30% unsure. When asked what factors might keep them in full-time work, participants noted that more flexible hours and out-of-	The career choices of female vocationally trained GPs must be taken into account in planning and implementation of primary care. The areas to be addressed are: facilitation of more flexible hours of work for GPs; exploration and expansion of part-time work practices; recruitment and retention of female GPs in rural practice; support for single-handed general practice; stress in general practice - balancing family commitment.

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					hours cover were the principal issues.	
Grant et al (2000) 179	UK	Survey	2	96 Interns in GP RR 56%	GP placement saw some swings towards career choice	Maybe because do less GP at medical school and exposure affects choice – implications for PGPPP?
Grant et al (2005) 142	UK	Survey	2	F1 and F2 doctors RR varied across attachments – 21% to 76%	The poor profile of career guidance for the respondents might be related to the apparent lack of its availability [58.9% of respondents had received no guidance].	Career counseling highlighted again 19 (40%) of the trainees changed their mind from the first choice at the beginning of the year to the first choice at the end of the year. There was equal movement towards and away from general practice as a career at this stage.
Halaas (2005) ¹⁸⁷	USA	Discussion article	2	843 former RPAP (rural program) students	36 week community elective; 30-40 students per year since 1971 - 78% now practising in primary care- 78% now practicing PC - 76% residents in PC programs - 76% residents in PC programs	Self selected to program - as self selection students presumably already have interest
Haq et al (2002) 119	USA	Letter to the editor re survey	2	1775 medical students, 1997-01 Asked re intended career choice	+ ve for family medicine: Development of long term relationships with patients Continuity of care Variety of patients and problems Serving underserved and in community	Specialist choice - Ability to master area of expertise Working with new technology Higher income Prestige Challenge
Hastings (2000) 131	USA	Letter to the editor	1	Students from Leicester Surveys	Postulate: quality of teaching in GP placement practices Teachers receive high ratings	Postulating on reasons for increase number of Leicester students entering general practice

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Hayden (2006) ¹⁴⁵	UK	Editorial	1			Comments on 'Modernising medical careers' 'GP needs to communicate balanced messages on recruitment and appointment rations and what might be expected from a career in GP now and in 10 years' time.'
Hays (2001) ⁴¹	Australia	Report	1		Report of JCU in Queensland Focuses on rural background students and indigenous health	JCU may be useful as model as aims to graduate doctors for rural and remote communities
Hays et al (2004) ⁴⁹	Australia	Letter with survey	2	31 interns	45% interested in GP Lack of knowledge about GP training and RTPs (regional training providers)	Students need more career advice and information to help make choice
Hays et al (2003) ⁶³	Australia	Report	1		Suggest that design of PBL cases may be influenced by those writing cases – rural doctor involvement may produce more cases with rural perspective and aid rural choice	1 st yrs influenced most by media This is probably relevant in the case that rural schools do lead to more rural choice and therefore curriculum is important
HWQ and ARRWAG (2006) ¹⁰	Australia	Workforce data	2			
Henderson et al (2002) ¹⁶²	UK	Cross-sectional survey	3	984 1 st and 5th-year students at 2 London medical schools; 700 replied (RR = 72%).	Medical students had a positive attitude towards general practice as a specialty and towards GPs as doctors. They rated personal experience of GPs as the most important factor influencing their attitude. Students' attitudes towards GP and GPs were more positive (p<0.001) in the fifth year. First-year	This study suggests that efforts by medical schools to ensure a more balanced, community-based curriculum promotes positive attitudes to general practice.

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					students perceived the media to have a more important role in influencing their attitude than those in fifth year ($p < 0.001$).	
Hill-Sakurai et al (2003) ¹⁷⁰	UK	Questionnaire	2	Students who had ever been interested in family medicine - 167 students at UCSF and 105 at Stanford were identified. The response rates were 84% and 90% respectively.	Students were questioned about positive or negative comments from a variety of people about their interest in family medicine or the specialty in general. Between 1993 and 2001, negative comments decreased. Required preclinical course work with family physicians was not consistently associated with greater student perception of faculty support for students' interest in family medicine, nor was it demonstrated to increase the amount or quality of interested students' interaction with family medicine faculty.	Shows no impact of preclinical family medicine courses
Howe et al (2001) ¹⁶⁵	UK	Before/After Questionnaire	3	4th year students were surveyed before and after they completed a community module; 3rd year students yet to do any clinical teaching components were the comparison cohort and they were exposed to a hospital setting between the 2 surveys; there were 692 recruits and 504 surveys returned (RR = 72.8%;)	Women were more likely to be community care oriented in both cohorts. There were significant differences in career preferences and attitude to primary care after the year with a community placement, with more students expressing a preference for a community-based career. This was particularly true for women, and less true for non-European students. Conversely, the hospital-	Community exposure can significantly alter career preference, at least within a year of its undertaking.

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					based students, especially men, showed a significant change toward hospital-based careers.	
Jackson et al (2003) ¹⁴¹	UK	Survey	2	Doctors in training, PRHOs, final year medical students RR42%	Long 148 page paper on providing career support to students and junior doctors Want balance between work and home life (71%) – but not experienced while in training. 50% of final year students not decided Hours of work most frequently cited reason for choosing general practice	Importance of career counselling: 69% wanted career advice informally by people with direct experience, 47% access to impartial advice 95% had career guidance requirements ling:
Jones et al (2000) ¹⁹⁶	USA	Workforce data	2	291 graduates (RR90%)	Effects of introducing a 4 week rural primary care clerkship to medical course More graduates chose rural career path after this.	
Jordan et al (2003) ¹²⁴	Canada	Qualitative study / Semi-structured interviews	2	11 of 29 graduating medical students matched to Canadian family medicine residency programs beginning July 2001	Family physician mentors were an important influence on participants' decisions to pursue careers in family medicine.	Having more family medicine role models early in medical school might encourage more medical students to select careers in family medicine. However small numbers in this survey
Juster et al (1999) ⁹⁵	USA	A presentation of data from the Association of American Medical Colleges (AAMC) Pre-Medical Student Questionnaire that indicates New York Medical School achieved its objectives of increased recruitment and selection of students	2		Increase in student numbers choosing generalist career from 21% in 91 to 49% in 2000 possibly due to the introduced changes such as - recruiting newsletters for PC curriculum, open houses for undergrads, visits to regional schools for recruitment, generalist admissions committee personnel, changes in interview format	Evidence not conclusive of cause and effect and which most powerful factors but there has been an obvious change

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		who graduate and enter generalist careers.				
Kassebaum et al; (1996) ⁹¹	USA	Logistic regression analysis of data from the Association of American Medical Colleges (to determine the relative predictive influences of variables)	2	1995 US medical school graduates	The intentions of the 1995 graduates to pursue generalist careers were significantly associated with demographic factors such as female gender, older students age, and rural hometown; early interest in the generalist specialties; attitudes favouring helping people over seeking opportunities for leadership, intellectual challenge, or research; the presence of a department of family medicine in the medical school; and ambulatory care experiences in the 3rd and 4th years.	The findings of this analysis add to the evidence that generalist career intentions are largely carried on the tide of students' interests and experiences in family medicine and ambulatory primary care. Plus female gender
Kebede et al (1995) ⁹³	USA	Questionnaire	3	All 458 graduates from the classes of 1980 through 1985 who had entered primary care residencies (ie: in family practice, general internal medicine, general pediatrics, or medicine-pediatrics)	The authors analyzed the difference in the choices of primary care (PC) versus other specialty practices among graduates of the Albany Medical College who took one of 3 career pathways before entering medical school and who had entered PC residencies. The 3 pathways were: 4 yrs of college, a 6-yr biomedical program, or a non-medical career and over 25 yrs. The authors found that career path before medical school had no effect on career choice.	Older paper but only one looking at pre-medical school study programs as possible influence on choice.
Khoo (2006) ¹⁶⁹	Malaysia	Before/After	3	78 students were	There was no statistical	Small numbers and rotation

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		Questionnaire		surveyed prior to a general practice rotation (RR = 75/78 = 96.1%) and 78 after the rotation (RR = 73/78 = 93.6%)	increase in the proportion of students wanting to work as a general practitioner in either Ireland or Malaysia after the general practice rotation.	short – 8 week course in year 5; however students had higher regard for GPs after rotation
Kutob et al (2003) ¹³⁴	USA	Survey	2	Heads of Department and faculty at 24 medical schools; 24 Heads of Department and 317 members of faculties of Family Medicine	12 schools had an increase in the number of students choosing family practice residencies and 12 had a decrease. Schools with an increase in student entry into family practice residencies were significantly more likely to report financial and philosophical support from their state legislature or medical school administration.	A common theme emerging from both the faculty and department head surveys was an inverse relationship between research activity and graduates choosing family practice. Need higher level institution support for family medicine
Kuzel et al (1999) ¹¹⁵	USA	Qualitative research to assess the impact of a grant to promote a balanced output of generalists and specialists at Virginia Commonwealth University	2	40 people in 7 focus groups (6 members on average in each focus group from 2nd-year and 4th-year students; the 2nd year students had experienced the new curriculum)	Students from all groups hoped for control of their practice, intellectual challenge, rewarding relationships with their patients and their own families, and fair compensation for effort; they worried about their future prospects, and specialty-oriented students felt that the emphasis on primary care production was being forced on the school; all groups saw managed care as doing more harm than good for patients, and all wished for improved career counselling.	All students in this study wanted improved career counselling.
Lambert et al (2007) ¹⁶⁰	UK	Survey	2	Medical graduates. Good numbers and RR (67%)	Most doctors not been able to obtain good quality	Career counselling again. Paper does not suggest ways may be

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				and 24 261) – on career advice	careers advice after qualification and would like it in the first year	given.
Lambert et al (2002) ²⁰	UK	Questionnaire	3	Questionnaires to graduates from 1974, 1977, 1983, 1988, 1993 and 1996 just after graduation, then 5 and 10 years after graduation. RR not given only percentages	The percentage of each cohort entering GP in the UK decreased over time. Although younger doctors are less inclined to enter GP nowadays, over half of the 1996 qualifiers, when surveyed in 1999, actually regarded GP as a more attractive career than hospital practice.	
Lang et al (2005) ¹⁹⁵	USA	Report on the Appalachian Preceptorship Program (1985 - 2004) which offers students clinical preceptorships in rural areas	2	225 medical students from 95 medical schools across the country Rural elective of 4 weeks	82% of the 157 participants who matched before 2004 had selected residencies in primary care, with 60% entering family medicine. Those completing the program were more than 3 times as likely to practice in a rural community compared with the national average.	- good description of program and its administration - good and reliable data sources However self selection to elective so interested in rural location already
Lawrence et al (2003) ¹⁴⁴	NZ	Survey	2	415 women graduates from Auckland from 73-97 RR 73% = 305	Factors = Interest and enjoyment Variety, Flexible working hours, Intellectual challenge Lowest = financial Women friendliness moderately important Those in GP – many prepared to trade some interest for increased flexibility	Flexibility important for women doctors
Lawson et al (2004) ¹¹⁶	USA	Logistic regression analysis of data from the Association of American Medical Colleges	2	555 medical school graduates over 5 years (1998 - 2002)	51% of the 555 students chose primary care residencies. Variables predictive of primary care (PC) residency choice were:	Similar factors to other papers including gender

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		Questionnaire and career choice data from one medical school			gender not having participated in a research project in medical school; attitudes toward 'the changing health care system on physicians' (ie: those more likely to choose a PC career are less likely to believe the changing health care system negatively affects them) and planning practice in a medically underserved area. The authors found no predictive value of age, marital status, undergraduate background, MCAT scores, and debt level on family medicine, internal medicine or pediatrics residency.	
Levy et al (2001) 168	USA	Prospective cohort study	3	913 Medical students completing family practice preceptorships at the University of Iowa (1990 - 1996)	The authors compared the background and experiences of those who matched into family practice (29%) with those who chose other specialties. Positive independent predictors of family practice match were hometown size less than 10 000, anticipating choosing family practice at matriculation and liking to help others Negative independent predictors included parental income of at least \$120 000, desiring to perform technical procedures and liking the scientific method and research. The effect of an early summer clinical	Student selection into a medical program is important (choose students from smaller towns?) Similar factors to other papers

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					experience at a community hospital varied depending on the level of student interest in family practice at matriculation.	
Liaw et al (2005) 60	Australia	Project report of UDRHs	2		Students expressed concern about this 4 weeks rural placement being compulsory	Interprofessional focus rather than career choice and quality of attachments. Important as looks at sustainability and this relates to rural experience and indirectly choice.
Lind et al (2002) 139	USA	Residency match and academic performance data for the University of Florida medical school graduates from 1982 through 2002.	2	University of Florida medical graduates (1982 through 2002)	Lifestyle friendly career choice increased from 9 - 22%. Primary care careers were constant.	Focus more on choice of surgical careers but again highlighting lifestyle as factor
Lloyd et al (2006) 144	UK	Questionnaire	2	GP registrars in Yorkshire, England (RR = 59%)	60% of respondents were female, and just over two thirds of them were planning to work part-time. 76% of GP registrars planned to take up a specific job in primary care. • 52% of respondents had sought a different medical career prior to general practice. Interest in teaching was expressed by 82% of respondents and in sub-specialisation by 83%. 57% of respondents said their job choice was affected by domestic commitments. More males than females intended to become a principal.	According to this study, prospective GPs want more job flexibility and want to be able to develop special interests. Plus part-time training posts
Lockwood (2002) 52	Australia	Review of regionalized GP	2	40% of key participants	Looking at training issues, recommends – keeping	More GP before training suggested but not sure if this

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					urban and rural streams apart	would affect choice. With lower registrar numbers and less competition for places the quality of some registrars was questionable (quality of workforce issues)
Lucas et al (2004) ¹⁰⁸	UK		2	16 GP registrars – don't say how recruited	Only one had positive experience of GP at med school -ve images of GP in hospital	Small numbers but backs up other data
Lynch et al (2000) ¹⁶³	USA	Questionnaire	2	137 first year medical students who attended a 3-day family medicine preceptorship; (RR = 74.5%)	A 3-day preceptorship in a small community did not appear to influence first-year students' opinions about living and working in small towns.	These findings suggest that brief exposure to rural medicine during medical school is, by itself, an inadequate approach to changing student opinions about small communities and encouraging interest in rural medicine. Did not define small town
MacKean et al (2003) ¹⁷⁴	Canada	Editorial	1		Need to change admission policy to admit more students with strengths assoc with FM (does not say what!) UG exposure to FM equal in length to other specialties +ve messages	Opinion that medical students say real medical teaching done by specialists Academic role models say FM not a prestigious career Family physicians say practices poorly understood and supported
Mahoney et al (2004) ¹⁵⁷	UK	Survey	2	234 SHOs/PRHOs		Indicates that there is a critical period during the end of clinical training and in first two years after qualification in which career intentions change – suggest early career advice
Mareck (2003) ¹⁸²	USA	An overview of the program offered at Minnesota Rural Health School - some evaluation (written evaluations, group discussions	2	239 participants of the Rural Physician Association Program (RPAP) - a program initiated to further address the continuing shortage of rural health care providers	The program may have lead to an increase in people working in rural areas as 67% of former graduates have chosen to work in a rural area.	Another paper re RPAP with similar results except looks at professional groups though does not address teamwork as factor

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		and debriefing; student before / after surveys)		– interdisciplinary attachments		
Mathers et al (2004) ¹⁷¹	UK	Semi-structured interviews (in general practices in Birmingham)	2	11 GPs, 6 practice managers and 4 practice nurses, as well as 6 receptionists/administrators	GPs feel that introducing students to GP early in their careers should influence career choice if 'good' placements and the GPs like teaching. Money to cover costs is insufficient and acts as a deterrent. Students have to travel further for placements.	Different perspective on student placements – important considerations in relation to increasing student numbers and their impact
Mayo et al (2006) ¹⁹³	Canada	Semi-structured interviews of spouses of GPs and family physicians	2	Of the 25 physicians in the region, 15 agreed to release their contact information and/or met the inclusion criteria; 15 spouses were interviewed	Physician workload and community integration most highly influenced by spousal contentment. Other factors, including licensure, remuneration and physician demand, indirectly influence spousal contentment and, ultimately, practice location decisions.	Many of the factors that directly influence spousal contentment are personal, and as a result, it is difficult to implement policies that will influence them. Small numbers
Mayorova et al (2005) ¹⁴⁵	Holland	Longitudinal cohort study	2	All Dutch GPs qualifying between 1982 and 2001 (N = 7234)	Preference for becoming a GP has significantly decreased among men. GPs prefer group practice more than solo practice. Female doctors were more likely to prefer a small practice. Career choices for men are more influenced by fluctuating labour markets, while female choices are more based on family circumstances.	As many female GPs abstain from practicing after having finished a vocational GP training program it will be essential to create work facilities to keep them available for the GP labour market. Confirming preference for part-time work for female GPs
McDougle et al (2006) ¹⁷⁵	USA	Editorial	1		Focus on winning respect in academic circles. Making FM attractive career choice Implementing science and IT in practice	Focus on initiatives and programs to promote family medicine in Ohio

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					Visibility of FPs in medical schools	
McPherson et al (2004) ¹⁷	USA	Report prepared by the American Academy of Family Physicians (AAFP) on the percentage of each US medical school's graduates entering family medicine residency programs (July 2002 - June 2003)	2	15 704 graduates of US medical schools between July 2002 and June 2003	More graduates enter family medicine from public universities (10.6% compared with 7.0%) in October 2003.	Medical schools have more graduates going into family practice if they have a Department of Family Medicine Again public v private influence – Australian significance? Similar to results from 3 years previously - below
McPherson et al (2002) ¹⁷⁷	USA	Report prepared by the American Academy of Family Physicians (AAFP) on the percentage of each US medical school's graduates entering family medicine residency programs (July 2000 - June 2001)	2	15 900 graduates of US medical schools between July 2000 and June 2001	More graduates enter family medicine from public universities (12.7% compared with 8.4%) in October 2000.	Medical schools with family medicine departments continue to produce graduates who are more likely to enter family medicine residency programs than medical schools with other or no administrative structure in family medicine.
Moore et al (2006) ¹⁴⁸	NZ	Questionnaire	2	296 first-year house officers practicing in New Zealand (RR = 53%)	The authors analyzed the psychosocial impact of debt, 92% of respondents had some form of student debt, with 85% having a government student loan. The authors found that student debt has a major negative impact on the lives of house officers in New Zealand (stress, quality of life and family).	There are implications of increasing debt to the lives of junior doctors. Included as partner paper to one below
Moore et al (2006) ¹⁴⁹	NZ	Questionnaire	2	296 first-year house officers practicing in New Zealand (RR = 53%)	43% noted that debt had an impact on specialty choice. 9% intended to enter GP. Over 50% would not or would be unlikely to practise	Low response rate

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Morrison et al (1996) ¹⁶⁶	UK	Cohort study of medical students	3	206 medical students undergoing their final clinical attachment at the University of Glasgow immediately before and immediately after a 4-week attachment in general practice. They were then followed up by a postal questionnaire at the end of the preregistration house officer year. 151 students returned all 3 questionnaires (RR = 73.3%).	in rural New Zealand. Before the attachment, students born outside the UK and those who had a previous or intercalated degree were significantly less likely to put GP as a career preference; female students were more likely to put it as their first career choice. After the attachment, the no. stating that it was 'likely' or 'very likely' that they would choose GP as a career increased from 60 to 72 - mainly through males changing their preference - but after the preregistration house officer year it had fallen back to 56. Reasons for changing to GP: dislike of hospital work, better lifestyle/hours, continuity. Reasons for changing away from GP: enjoy hospital work, dislike management aspect.	There was no association with: gender, age, relative in medicine and previous prizes and distinctions. The change to GP after an attachment was temporary and had changed back to the same level after the period as an intern. Dislike of hospital also a factor rather than necessarily like of GP
Morrissy (1996) ¹⁷⁴	Canada	Editorial	1		Asks wider questions about why have UG depts of GP, what should be contribution of GP to UG education - each dept should contribute to general curriculum and contribute own special knowledge and skills	Should admission policy be changed to admit students already showing interest in GP?
Neill et al (2002) ⁸⁰	Australia	Attachment description and evaluation	2	Nursing students – 90 undertook attachment but comments included from 5 only	Rural placements help choice of rural career	Suggested – providing more rural placements while in school allows opportunities for recruitment into future rural

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						places - 59% (of n=33) 1998-99 students with rural clinical placements now nursing rurally - need increased funding to support rural placements Not really presented as research paper
Newton et al (2003) ¹⁵	USA	Report of temporal trends in the number of US medical doctors entering residencies in primary care, general or subspecialty surgical, and non-primary care and nonsurgical specialties from 1987 - 2002.	2	Data extracted from 3 databases - Association of American Medical Colleges Graduation Questionnaire (AAMC GQ), the National Resident Matching Program, and the national Graduate Medical Education census.	In 1987, 49.2% of all medical school graduates matched to one of the generalist residencies (internal medicine, pediatrics, or family medicine). This percentage declined in the early 1990s and then increased to 53.2% in 1998, and then declined again to 44.2% in 2002. Concurrent with the latter decline, AAMC GQ data showed a decrease in medical student interest in PC careers (35.6% in 1999 to 21.5% in 2002)	Confirms ongoing trends in career choice without discussing factors
Nguyen-Van-Tam et al (2001) ¹²⁴	UK	Postal survey	2	Questionnaire sent to a cohort of 266 of Nottingham medical students who entered the honours year in Public Health and Epidemiology between 1973 and 1993; career information was available on 203 students.	There was no negative effect of the honours year on GP output with 44% of those for whom career information was available working in GP (expected 40 - 45%).	According to this study, the honours year does encourage entry into academic and research careers in general and the type of honours year department strongly influences the subsequent choice of specialty. Intercalated degrees in UK so questionable relevance to Australia except in thinking of having honours within GP departments
Nieman et al (2004) ¹⁶⁷	USA	An analysis of the Texas Statewide Family Practice Preceptorship	2	10 081 students graduating from 1992 through 2000 who chose family practice or other	The proportion of students choosing family practice residencies among TSFPPP participants was significantly	Influence of family practice placements

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		Program (TSFPPP) efficacy in terms of 4 evaluation questions and outcome measures identified by program users from 8 Texas medical schools.		primary care residencies following participation or non-participation in the TSFPPP's preclinical and clinical programs.	greater than among non-participants. Participation in the TSFPPP was associated with an increased choice of a family practice residency for students who were involved in the TSFPPP at the preclinical level (OR = 1.62; 95% CI 1.41 - 1.87); the clinical level (OR = 2.31; 95% CI 1.99 - 2.68); and both levels (OR = 4.98; 95% CI 3.75 - 6.68)	
Norington (1997) 153	Australia	Review	1		RUSC recommendations of distribution of funding to schools and overview of program to recruit and retain rural physicians	Changes in Aus have been to increase access to med school for rural students and inviting GP attachments
Norris (2005) ⁵⁴	USA	Editorial	1			Discussion of rural pipeline metaphor
Owen et al (2002) 94	USA	Comparison of the relationship between the characteristics of applicants to medical school and career predictions at graduation using regression models; a secondary analysis was also carried out which examined the relationship between the students' stated career preferences at matriculation and career plans at graduation.		520 applicants who entered medical school from 1990 through 1993 and graduated 1994 - 1997; career intention data collected just before graduation available for 509 (98%)	The accuracy of the committee members' predictions was low. Predictions of generalist careers were significantly related to 7 applicant characteristics: rural legal residence, gender (women), lower science grades, lower MCAT science scores, lower levels of parents' education, no reported research activity, and higher levels of community service. The students' actual generalist career plans at graduation were significantly related only to gender (women) and higher levels of community service.	In the secondary analysis, applicants' stated career preferences at matriculation were the strongest predictor of their having generalist career plans at graduation.

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Pathman (1996) ¹⁰¹	USA	Opinion piece	1		How much does med school experience influence choice? Nature v nurture debate discussed	Ask questions: Do students choose medical schools because of their career preferences?
Pearce et al (2003) ⁵⁰	Australia	Review	1		Looks at doctors applying to GP VTS and suggesting reasons why decrease. Are international medical graduates less likely to choose general practice training?	Intrinsic Extrinsic factors discussed. 'GP will not be as popular with doctors from non-English speaking backgrounds who are increasingly represented in our medical schools' Gives no evidence for this statement.
Pereira Gray (1999) ¹⁰³	UK	Editorial	1			'If famous medical schools cannot convince some of the brightest young people in Britain of the rich intellectual and emotional rewards of GP medicine, they must be failing in some way to demonstrate the potential of the discipline.'
Petchey et al (1997) ¹³⁴	UK	In depth interviews (purposive sample); qualitative research	2	54 junior doctors below belonging to the Nottingham postgraduate scheme in the East Midlands.	Career deliberations are complex and multifactorial. Three main criteria were identified: clinical content of practice, lifestyle, and organizational context of practice. Clinical content was most highly valued, but was recognized to conflict with lifestyle. Compared with hospital medicine, general practice was associated with inferior clinical content but superior lifestyle. Choice of GP as a career was often based on negative	According to this study, GP lifestyle was noted as better (able to run your own business, is better for females, and is compatible with family commitments). Another paper highlighting the importance of lifestyle as factor in choice

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					judgments.	
Pugno et al (2001) ¹⁰⁹	USA	AAFP report NRMP = national residency matching program	2		Decrease student interest in FP. Authors suggest reasons from the literature: Lack prestige -ve comments 3 rd yr clerkships in FM lack intellectual rigour	
Pugno et al (2002) ¹⁰⁴	USA	AAFP report NRMP	2		5 th year of decline Same suggestions as 2001 + debt	
Pugno et al (2005) ¹³²	USA	AAFP report NRMP = national residency matching program	2	All US family residency program directors (100% rr)		Again highlights importance of Departments of Family Medicine
Rabinowitz et al (2001) ¹⁹⁰	USA	Workforce data	2	1 medical school – 3414 graduates including 220 PSAP graduates 98.6% of data available	Effects of PSAP – physician shortage area program. Students going directly into this do stay in rural practice – can be decided at entry to medical school through their stating of career choice and rural background. Growing up in rural area also predictor for non PSAP doctors.	This paper looks at longer term outcomes so useful for this.
Ramsey et al (2004) ¹⁷³	USA	Questionnaire on the International Health Fellowship Program (IHFP)	2	60 fellows of the IHFP 4 - 7 years earlier; 42 questionnaires were returned (RR = 70%)	Program fellows were more likely to enter Primary Care areas - 74% primary care. 67% of respondents felt that the IHFP had influence on career choice. 31% of respondents spent most of their time working with underserved populations. 67% had been involved in community health projects.	Small numbers IHFP = international health fellowship program – is a 2 week classroom introduction, then 6-8 week international placement Choose to do this (like elective) so probably already have interest in this type of practice
Retchin et al (2001) ¹⁵⁸	USA	Review of marketplace influences on	1/2		Health care delivery system impacts decisions of students in relation to	Generalizability to Australia? More of a business focus, but deals with education and career

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		medical student career choice / almost an opinion piece influenced by a literature search – not systematic			financial perspectives	guidance Recommendations given: Offer seminar on marketplace issues to students Career counselling services These may not increase interest in PC but inform students possibly leading to enhanced informed choice
Rezler et al (1989) ¹⁸⁸	USA	Questionnaire - retrospective	2	43 students (of 88) from six consecutive primary care curriculum classes (1983 to 1988) who declared family medicine as their initial career goal completed a telephone survey.	24 of the 43 respondents changed to a specialty by the time they became residents and five additional students, whose career choice were uncertain at entrance, chose family medicine at residency match. Those who became family practitioners shared some predominant traits: they were from a rural background and over 25 years, they were married, they attended a public school, they had strong motivation for patient contact, and they expressed a stronger concern for humanistic instead of scientific interests.	These qualities were then compared with 30 randomly selected graduates. The use of the criteria proved to be helpful with 25 of the 30 correctly identified as either future family physicians or specialists. It is suggested that the use of these criteria may be helpful in the medical school admissions process.
Rhyne et al (2006) ¹⁸³	USA	Questionnaire	3	There were 1610 eligible students (Rural Health Interdisciplinary Program students and randomly selected classmate controls) and surveys mailed to 1396; surveys were returned by 820 students (RR = 59%). 24 respondents were	The authors assessed the effect of the Rural Health Interdisciplinary Program (RHIP) and subsequent practice in US rural and underserved locations. Participation in RHIP and other rural training experiences may stimulate subsequent career choices in	Medical and nursing students did not choose rural practices more often

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				excluded for lack of employment histories leaving 765 for the outcome analysis.	rural and underserved locations for pharmacy/therapies students.	
Rosenblatt et al (2005) ¹⁵¹	USA	Logistic regression on results from questions on students' debt and career choice in the Association of American Medical Colleges' 2002 Medical School Graduation Questionnaire.	2	14 240 medical graduates completed the 2002 graduate questionnaire carried out by AAMC.	Inverse relationship between the level of total educational debt and the intention to enter primary care. Females are more likely to choose primary care, especially pediatrics, than males.	Debt as factor in choice
Rosenthal et al (1996) ¹⁵⁰	USA	Data from the Jefferson Longitudinal Study (Jefferson Medical College of Thomas Jefferson University) were analyzed	2	326 graduates from the classes of 1992 and 1993	A high level of indebtedness (at least \$75 000) was a significant independent predictor of specialty choice (away from family practice); first-year preference for family practice and income expectations were also significant independent predictors.	High levels of debt had a significant negative effect on family practice specialty choice
Rosenthal et al (2004) ¹⁰⁰	USA	Letter to the editor About research project – survey about FMIG – family medicine interest groups	2	Email to 124 med schools 116 replies	No association between FMIG activity and funding and number of students entering family medicine	
Rosenthal et al (2000) ²⁰¹	USA	Questionnaire	2	77 graduates of 13 nationally distributed rural training tracks that had graduates between 1988 and 1997; 64 responded (RR = 83%)	76% of respondents practice in a rural community, and 61% practice in federally designated health professional shortage areas. residency training.	Rural residency tracks in the USA are voluntary (compared with Australia) and 1 year in length. They are often unfilled. Rural training tracks do influence work placements
Rosser (2002) ¹⁸	Canada	Editorial	1		Suggestions to increase GP choice: Lack of visibility of GPs in teaching hospitals	40% chose FP in 1990s <28% in 2001

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					GPs complain about their lot Money needed to invest in practices	
Rourke (2005) ²⁰³	Canada	Essay / Commentary on strategies to increase enrolment of students rural origin	1		Rural schools have less academic focus	Suggests longer rural term placements 10.8% medical students have rural background cf 22.4% population Good list of strategies in paper
Rourke et al (2005) ¹⁹²	Canada	Questionnaire	2	1012 family physicians (507 rural and 505 urban) practising in Ontario Responses were from 264 rural physicians (RR = 52%) and 179 urban physicians (RR = 35%).	Rural doctors were more likely to be of rural origin, had rural clinical experience in medical school, and had longer rural placements.	Another paper linking rural origin to rural practice
Schafer et al (2000) ¹²⁰	USA	Questionnaire	2	397 graduating medical students after the National Resident Matching Program Match and before graduation in 1996, 1997 and 1998. 320 people responded (RR = 81%). challenging diagnostic problems.	Students rejecting family practice were more likely to cite insufficient prestige, low intellectual content, and concern about mastering too broad a content area as reasons	Students think impossibly broad range of expertise required in family practice
Scherger (2005) ⁹⁹	USA	Letter	1		To generate interest: Start a list in yr 1 of students interested in FM, reinforce the value of FM training. Be most helpful specialty in helping students in residency selection	Suggestions – interesting about being helpful
Schoo et al (2005) ⁸⁵	Australia	Conceptual model based on workforce data	1	No search strategy described	To be determined after implementation – follow up in 2008 Nice diagram of model: interaction of individual,	Strategies based on needs of individual, community, organization " recruitment and retention likely to improve with a set of

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					community and organisational needs	actions that includes: the provision of CPD and work exchange opportunities, teaching managerial competencies, utilising the various disciplines and allied health assistants, enhancing student placements, creating a supportive and creative work environment and having an active and supportive community”
Schwartz et al (2005) ¹⁵⁵	USA	Review of the history of and trends in career choice.	1			Review of historical recommendations of 1985 which were followed by increase in students choosing generalist careers (though only partially followed)
Senf et al (2004) ¹¹⁷	USA	Questionnaire	2	All family physicians and an equal number of other primary care physicians graduating from one of 24 medical schools in 1997 - 1999.	With regard to choice of specialty, for family physicians, the most important factor was patient relationships.	
Senf et al (2005) ¹³⁵	USA	Questionnaire - as above	2	As above.	Students interested in family medicine were less likely to have selected the field of medicine because of research interests, were less likely to have participated in a research project during medical school, and at graduation were less likely to plan on a career involving research.	Another paper on the inverse link between research and family medicine
Shannon et al (2005) ¹⁸⁴	USA	Survey	2	Since 1996, most of West Virginia's state-supported health professions students have been	Respondents were more interested in a career in a rural area post rural health rotation.	Rural placements influence career choice across the professions

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				required to complete a 12-week rural rotation - 1872 students in 10 disciplines from 7 institutions of higher learning completed a post-rotation survey. 1360 students completed the questionnaire (RR = 73%).		
Sibbald (2000) ¹⁹	Canada	News and Analysis	1		Suggests factors are: ^ workload in FP ^ reluctance to work in rural areas Decrease in resident salaries	
Sinclair et al (2006) ¹²³	Scotland	Questionnaire	2	All 176 Aberdeen Medical School entrants in 1996, and five annual follow-ups (four undergraduate, one postgraduate). Response rates: Yr 1 = 100%, Yr 2 = 78%, Yr 3 = 70%, Yr 4 = 64%, Yr 5 = 65%, pre-registration house officer (PRHO) = 60%.	Females were more positive about a career in GP. GP was the first choice for 13% of students in yr 1; 9% in yr 2; 22% in yr 3; 24% in yr 4; 27% in yr 5; 29% in PRHO. Those choosing GP were more likely to be female, rate their academic abilities lower and their non-academic abilities as average, and have decided on their future career earlier. Reasons for GP included: working in and being part of a community; continuity of patient content; variety of illnesses and people encountered; undergraduate teaching experiences; dislike of or disillusionment with hospital medicine; and an increasing awareness of part-time opportunities.	Dislike of hospital medicine a factor. Confirms gender difference
Smith et al (2005)	UK	Review of GP	2		GP is unpopular compared	

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21		training in one region			to other specialties as this time Trends: flexible working and female Need portfolio working and career breaks	
South-Paul (2005) 88	USA	Opinion	1			'Our challenge as old-timers is to understand the goals and motivating forces for both of these younger generations and combine them with the powerful motivating forces that created our discipline, so that they can assist us in moving forward with energy, enthusiasm and focus in the 21 st century.'
Sturmberg et al (2003) ¹⁵⁶	Australia	Letter	1			Need a broader conceptualization of GP
Szafran et al (2001) ²⁰²	Canada	Questionnaire (Cross-sectional, retrospective)	2	702 graduates who completed the family medicine residency program at the University of Alberta or the University of Calgary (1985 - 1995); 442 graduates completed the questionnaire (RR = 63%).	Most influential factors in attracting graduates to their current practice locations were spousal influence, type of practice, and proximity to extended family. Type of practice, income, community effort to recruit, medical need in the area, and load repayments had a substantial influence on decisions to practice in rural areas.	Male physicians ranked type of practice, whereas female physicians ranked spousal influence, as having the most influence on choice of practice location. Significantly more female than male physicians identified working hours, familiarity with the medical community or resources, and availability of support facilities and personnel as having a moderate or major influence on their decisions.
Tavernier et al (2003) ¹⁹⁴	USA	Survey	2	3 rd yr FP residents – 450 programs with RR in programs about 17% - 33%. 775 in all.	Choice factors for MUA (medically underserved areas). 36% chosen to work in MUA. Some doctors have obligation to serve in these areas. Factors = exposure as medical student (14.7%)	Effect of background. Correlate with rural clinical experience?

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					being born or raised in MUA highest factor (19.6%) However early exposure in medical school as little effect but exposure prior to medical school does	
Thornton et al (2003) ¹³⁸	USA	Modelling	3	Empirical model based on variables and analysis looking at residency choice	'Implies that medical residents prefer primary care specialties with shorter and more certain work weeks – longer and more certain annual vacations, higher earnings and for primary care shorter work weeks'	
Topps et al (2003) ²⁰⁴	Canada	Opinion piece				Gives possible solutions to rural workforce issues
Urbina et al (2003) ¹⁷²	USA	Yearly practice location and specialty questionnaires (from 1983 to 1994) and New Mexico Board of Medical Examiners publications.	3	The authors compared 249 graduating medical students who did a Phase 1B 16 week first year preceptorship and completed a questionnaire over the period from 1980 - 1994 and 684 graduating students not exposed to Phase 1B.	99 of the 249 (40%) students who did Phase 1B were practicing in New Mexico. This compares to 221 of 249 (32%) non-Phase 1B practicing in the state (p = 0.03). In the Phase 1B group, 58 (23%) practice primary care in New Mexico. The non-Phase 1B group has 112 (16%) primary care physicians in New Mexico (p = 0.0154)	Long lag to publication. Did not look at other factors influencing choice
Walker (2006) ¹⁴	USA	Editorial	1		Looks at difference in pay levels of to patients seen per week	Suggests 4 points where leverage can be applied: Medical school applicants Med school curriculum Residency programs Practice (obvious really!)
Walzman et al (2007) ¹⁸⁰	UK	Questionnaire	2	55 F2 doctors, 35 replied (63.6%)	Glad done GP attachment in F2, 34/35 would recommend the GP attachment to other doctors. Reinforced decision to become GP in those who	Small numbers – relate to PGPPP?

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					had already chosen, 6 changed to GP plus 1 who had been undecided	
Weaver et al (2001) ¹⁵²	USA	Questionnaire	2	All 729 family practice residents in Texas (in 28 Texas family practice residency programs). The response rate was 75%.	Satisfaction with 25 various aspects of family practice residency training was significantly higher in community-based programs, compared with university-based programs, and satisfaction increased with year level of training.	
Whatley (2003) ¹⁷⁸	Canada	Letter and response	1		Relates decrease in numbers to abolishment of rotating internships Choosing FP leaves no options, no retraining, lower remuneration and respect (his opinion)	
Williamson et al (2003) ¹⁹⁷	NZ	Questionnaire	2	Two cohorts of students from Dunedin School of Medicine surveyed before and after their rural GP attachment during 5th year. One cohort from 2000 and the other from 2001. Total of 167 returned questionnaires, 87 pre-course (RR = 88) and 80 post-course (RR = 81%) questionnaires.	Choice of GP was found to be influenced positively by: greater exposure to GP as an UG and better quality hospital posts for Vocational Training Schemes; and negatively by: negative comments by hospital based staff that GP is a second class career and the	Such an attachment does produce attitudinal change towards a career in rural general practice, but as career choice was often made at entry and before 5th year so having a rural GP attachment at this stage may be too late.
Woloschuk et al (2002) ¹⁹¹	Canada	Questionnaire	2	254 family medicine clinical clerks from the final-year of a 3-year program at the University of Calgary from 5 consecutive years 1996 - 2000	Compared to their urban-raised peers, students from rural backgrounds reported a significantly greater likelihood of doing a rural locum and practising in a rural community, irrespective of gender or participating in a rural educational experience	

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Woloschuk et al (2004) ¹⁹⁸	Canada	Questionnaire	2	254 family medicine clinical clerks from the final-year of a 3-year program at the University of Calgary from 5 consecutive years 1996 - 2000 were followed up to determine whether students actually carried out their intentions	78 students from the original cohort were found to be practising family medicine; 22 of them had been rurally raised. Seven (32%) of the rural background students were practising in a rural community, compared to 7 (13%) of the 56 urban background students (relative risk = 2.55); $P < 0.05$). Rural background students who subsequently graduated from family medicine residency programs were approximately 2.5 times more likely to enter rural practice than their urban background peers.	Relying on rural background students at the rate at which they currently enter medical school to fill the rural workforce void any time soon is likely to be ineffectual.
Woloschuk et al (2005) ¹⁹⁹	Canada	Questionnaire (Cross-sectional, postal)	2	Graduates (n = 369) of the family medicine residency program at the universities of Alberta and Calgary between 1996 and 2000 (RR = 76.4%)	Factor analysis of the 8 preparedness items produced 2 factors, 'rural culture' and 'rural community leader' which explained 72% of the variance (a coefficient for each factor was 0.87). Family medicine graduates prepared for rural community leadership roles were 1.92 (CI = 1.03 - 3.61) times more likely to be in rural practice. Rural physicians were 2.14 (CI = 1.13 - 4.03) times as likely to have a rural background.	This study shows that rural physicians are more likely to have a rural background.
Wong (2003) ¹⁶¹	Canada	Comment	1			'Every MS deserves a memorable experience in FM' Dr-pt relationship important to

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						demonstrate
Woodcock (2006) 181	UK	Essay	2		Comment on foundation yr 2 GP attachments attracting doctors to GP – GP as junior doctor more attractive placement than as student as able to interact with patients	Importance of students attachments in GP being hands on
Wright et al (2004) ¹²¹	Canada	Questionnaire (Prospective)	2	583 first year students at 3 universities; 519 students responded (RR = 89%).	20% of respondents put FM as primary choice. Factor analysis produced 5 factors that explained 52% of variance in responses with regard to career choice: medical lifestyle, societal orientation, prestige, hospital orientation and varied scope of practice. Those who identified FM as first choice tended to be older, to be concerned about medical lifestyle and to have lived in small communities at the time of completing high school; they were also less likely to be hospital oriented. They were also more likely to demonstrate a societal orientation and to desire a varied scope of practice.	
Wright et al (1997) ¹²⁷	Canada	Questionnaire (cross-sectional)	2	136 of 146 graduating medical students in 1995 of McGill University School of Medicine, Montreal (RR = 93%).	90% of graduating students had identified a role model or models during medical school. Personality, clinical skills and competence, and teaching ability were most important in the selection of a role model; research achievements and academic position were least	Exposure to role models in a particular clinical field is strongly associated with medical students' choice of clinical field for residency training.

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					important. 63% of respondents received career counseling and advice from their role models.	
Xu et al (1997) ⁹⁶	USA	National USA survey	2	1993: physicians including family practice RR 73.5% 1911 returned	Older graduates are influenced by family responsibilities and choose shorter training because of this	Older paper but confirms influence of domestic commitments – may have implications for graduate entry schools
Zarkovic et al (2006) ¹²⁸	NZ	Questionnaire	2	400 questionnaires were distributed to final year medical students as well as to junior doctors in their 1st to 4th year of PG training; 256 were returned (RR = 64%).	The two most influential factors on career choice were: rotation/experience in a specialty and role model.	Adequate guidance throughout medical training and opportunity to gather work-experience over several specialties should be encouraged. Methodology questionable
Zinn et al (2001) ¹²²	USA	Telephone interviews	2	219 medical students and 241 residents were interviewed.	There was a persistent erosion of the orientation of students towards PC from their first year of medical school, even though the environment for primary care had improved (ie an increasing percentage of respondents thought that faculty and house staff were increasingly positive towards primary care).	Extensive description of data analysis

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