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General Practice Research

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Chapter 5

General practice research

5.1 Introduction

The inclusion of a separate chapter about general practice research is welcome. It is a natural consequence of the recognition that the development of an evidence-based approach to general practice requires investment in a research base that is focused primarily on general practice. This is also recognised by substantial Australian Government funding for GP research and increased performance of GP researchers in both mainstream funding bids and publication. However, these are early days and general practice research, with its unique mix of science and social science methodologies, remains less well recognised than research based in other medical disciplines. In the two previous editions, the subject of research was embedded in chapters about education and training of GPs. For research to take its place as a core element of general practice is a step forward. The present chapter sketches the current status of general practice research in Australia and includes suggestions for enhancing it.

5.1.1 What is research?

We have adopted a broad conceptual definition of the process of research which can be summarised as follows:

- questions are deliberately asked
- answers are found using a systematic process
- results are analysed in a transparent and reproducible manner
- conclusions are judged on the basis of the quality and meaning of the results, and compared to other studies
- results are applied appropriately
- results are disseminated to those who might effect change.

The spectrum of research activities includes evaluation studies, developmental projects, clinical audits, large-scale multi-centre clinical trials, patient satisfaction studies, assessment of interventions and trials of different service delivery models. However, each of these activities must be conducted according to the 'rules' of research in order to be considered research.

5.1.2 Different levels of research

There are varying levels of engagement by research users, participants and leaders, as depicted in Figure 5.1 (taken from Del Mar 2001). Active involvement at the highest order within each level should be encouraged and facilitated. Those actively involved in research need to work with those who will use the results of the research, so that research can be seen as relevant to every day practice.

All GPs use research results in their clinical practice (the bottom level of the triangle) and, indeed, GP-based research is of interest to nonGPs who interact with general practice (eg shared patient populations). For some, this could simply be that they absorb it into their clinical practice ‘by osmosis’ from a wide number of sources (eg drug representatives, medical newspapers, lectures by specialists and discussions with their colleagues) (Armstrong et al. 1996). Others consciously seek the best available research evidence, appraise it, and combine it with clinical experience and patient values to inform their clinical decision-making (the principles of evidence-based medicine, EBM) (Sackett 2000). This can apply equally to general practice policy, project and program development.

Increasing the number of GPs practising EBM will encourage critical enquiry within the discipline. This should highlight gaps in the evidence, and in turn have GPs wanting to address these gaps through participation in research. Support for any level of research should result in a drift from lower to higher levels of the triangle (Figure 5.1). The primary care research strategy, implemented by the Australian Government in 2000 under the Primary Health Care Research, Evaluation and Development (PHCRED) program, is likely to convert some of those at the lower level (users) to the middle level (participants), and some from the middle to the top level (leaders of research). Strictly speaking, this has not been specified as a specific aim, although it is likely to be one consequence of the strategy.

5.2 Why research in general practice is needed

The reasons that development of research in general practice is important will be discussed in this section.

5.2.1 Research improves patient care

Research improves patient care in general practice as in any other medical discipline and is the fundamental way that routine clinical practice is improved. Some examples of ways that research has improved patient care are:

- the recognition of the role of bacteria in peptic ulcer disease led to modern and effective treatments
- the use of aspirin for the secondary prevention of ischaemic cardiac events following pragmatic large-scale trials in men with cardiovascular disease
- the use of antibiotics to treat acute upper respiratory tract illnesses decreased after a meta-analysis of trials showed little benefit from their use.

General practice has specific clinical research needs. It has a high degree of contextual complexity (a broad range of relatively un-evolved signs and symptoms, presented within the patient’s psychological and social setting) compared with the technical complexity of the medical specialties (a narrower range of defined symptoms involving single body systems, more severe illnesses, and limited reference to the patient’s social context) (Van Weel 1999). Questions emanating from this contextual complexity can be diagnostic, prognostic, interventional or phenomenological.

Gaps in the evidence that GPs need to make decisions limit their ability to provide the highest quality care (Department of Health UK 1999). It is useful to think of these evidence gaps as being of several types:

- Basic science gaps: a lack of either clinical or social science evidence. Gaps in clinical science are exemplified by a lack of knowledge about the pathophysiology and natural history of many diseases commonly seen in general practice. Our limited understanding of help-seeking behaviour is an example of a social science gap. For example, why do some people with upper-respiratory tract infections (coughs, colds, sore throats etc) present to their GP, while others with the same symptoms self-medicate or take no action?
- Effectiveness gaps: a lack of evidence demonstrating either clinical effectiveness or cost effectiveness of interventions routinely used in general practice (diagnosis, treatment or service delivery).
- Applicability gaps: a lack of 'translational research' to ensure that evidence generated in nonprimary care settings is applicable in general practice.
- Implementation gaps: the gap between identifying effective care and who should receive it, and what occurs in routine general practice.

5.2.2 Research is important for teachers of general practice

We start from the premise that good teachers contribute to the body of knowledge they teach and that research is the main avenue for this contribution. Good research does not guarantee good teaching skills and, similarly, good teachers are not always involved in research. However, we would assert that the best teachers are intimately involved in generating the body of knowledge they teach.

Many educational innovations in medical schools, such as teaching communication skills, have been led by academic general practice, but these attract less prestige than research conducted by the specialties (Rosser 2002). As a result, teachers of general practice are often not seen as experts in research, but are perhaps overestimated as experts in teaching. Certainly the role of GPs as teachers has expanded, with more community-based teaching at both the undergraduate and postgraduate level. This role has been recognised through increased government payments to GPs who undertake teaching.

This imbalance between recognition and expectation is aggravated by the recent emergence of the discipline of academic general practice, its relative under-resourcing, and heavy teaching loads (Kamien 2001). More than half of medical undergraduates will eventually become GPs and there is a need to link undergraduate and postgraduate training for general practice to increase the critical intellectual mass of the discipline. Additionally, the strong emphasis on hospital work for both medical students and young doctors is to the detriment of the primarily community-based discipline of general practice. Increasing exposure to community-based teaching, including whole years spent away from teaching hospitals, has not only provided a better intellectual base, but also an impetus for an associated research momentum by requiring additional funding for capacity building in teaching and research in general practice.

5.2.3 Research stimulates intellectual rigour and critical thinking

General practice has a reputation for being among the least intellectually rigorous clinical disciplines. This has several serious consequences for GPs:

- loss of self-confidence
- less application of critical thinking in routine clinical work
- lack of attractiveness of general practice as an intellectual pursuit
- difficulty attracting research funding.

Research stimulates intellectual rigour and critical thinking not only among those *doing* it, but also among those *using* it. A strong research tradition is the most direct route to enhancing a discipline's intellectual rigour, and its individual practitioners' critical thinking skills. Better critical thinking leads to better quality care, further research and enhanced intellectual capital.

5.3 The rise of Australian general practice research

While history provides many examples of enlightened research by family doctors, in Australia general practice research really began to develop in earnest with the establishment of the GP practice grants program in 1991–92. This provided, in a limited way, quarantined funding for GP-based projects and showed that there were plenty of research questions and people willing to try to answer them if given the opportunity.

5.3.1 The pioneers of general practice research and their contribution

General practice research has a long history. During the 18th century, Edward Jenner 'discovered' a means to control, and ultimately virtually eradicate, smallpox. In the 19th century, William Budd, a GP and pioneer of field epidemiology, argued that typhoid was a communicable disease and that water was its principal vector. James Mackenzie, in a working-class general practice in Burnley in the UK, identified heart-block, invented the forerunner of the electrocardiograph and went on to establish a research institute in St Andrews where local GPs carried out investigations. Inspired by James Mackenzie, William Pickles, an early 20th century GP from Wensleydale, characterised 'infectious hepatitis' (hepatitis A) as well as Bornholm Disease (Gray 1991, Digby 1999).

These early researchers were advocates for the unique perspective of GPs, being in a position to see diseases from their early stages through to completion or resolution. They studied phenomena seen in their practices, observing the natural progression of diseases and taking pragmatic approaches to problem solving and they were recognised for their important contribution.

However, by the beginning of the 20th century, the average GP was not perceived as being particularly scholarly. Few had higher academic qualifications or published research and, in an increasingly competitive medical market, most were focused instead on making a living. The move towards more specialised and laboratory-based medicine also made the often observational nature of general practice research seem less scientific and less rigorous (Digby 1999).

5.3.2 Australian general practice researchers

The examples below demonstrate the typical careers of some Australian general practice researchers. They are illustrative only, and are not necessarily the most important ones. The early GP researchers listed in Table 5.1 were full-time GPs who undertook their research, at least initially, as a hobby. For many, this was fulfilling in itself. For others, success at research led to subsequent careers as academics.

Among the current generation of GP researchers, some of whom feature in Table 5.2, the stereotype is of someone who entered academia early and was therefore able to prepare themselves for a research career by suitable education and training. They include GPs, social and behavioural scientists, health economists, and health planners.

Important contributors to public health research (Table 5.3) have sprung from the fertile ground of general practice. Sometimes this has meant a loss to general practice. Clearly the encouragement of a population health approach to general practice (especially by government with the responsibility

Table 5.1 Early Australian GP researchers

Researcher	Background	Most important contributions
Clifford Jungfer	Full-time general practice	Undertook the first qualitative research in Australian general practice in the 1960s, studying the quality of general practice. He combined questionnaires, observation and interviews to develop measures to promote high standards of practice.
Alan Chancellor	Full-time general practice	Published morbidity studies, and conducted clinical research. He also promoted research within the Royal Australian College of General Practitioners through committee work and the donation of an annual award for up-and-coming researchers.
Charles Bridges-Webb	Full-time rural general practice	Undertook morbidity studies in his local community while still a full-time GP. Moved to academia and, amongst a wide range of research interests, undertook a national survey of general practice activity in 1990–91 (Australian Morbidity and Treatment Survey, AMTS), the forerunner of the BEACH (Bettering the Evaluation And Care of Health) program.
Max Kamien	Full-time physician in general practice	Early advocate of rural general practice and Indigenous health research. A fierce proponent of general practice education.

for the care of populations) means that academic GPs may well be seduced by a new-found interest in public health. Other academic GPs have managed to retain their GP origins while still taking a very public health approach to research.

5.3.3 The rise of health services research

Primary care is recognised as the backbone of a rational health system. Orientation of a country's health care system towards primary care is associated with better cost-effectiveness, higher levels of satisfaction with the health care system, better health levels and lower medication use (Starfield 1994). In conjunction with burgeoning expenditure on health care, this may be why most Western countries reviewed their systems of health care provision during the 1990s (Silagy 1994, Van Weel 1999). Governments have realised that even though hospitals and aged care facilities are where most national health care costs are spent, general practice is responsible for many of these costs downstream. This has quickened the interest of government in general practice, and increased the amount of commissioned research into the operational and economic aspects of health care delivery in general practice — health services research.

Health services research can determine the rational allocation of limited health system resources and research funds. Consequently, GP researchers may need to 'tweak' their projects to fit into the agenda of the day in order to access funding (Pond 2003). However, it is important that general practice clinical topics are also researched, and GPs wanting to do clinical research must not be discouraged because of difficulty in gaining support. In particular, there are increasing opportunities

Table 5.2 Australian career GP researchers

Researcher	Background	Most important contributions
Paul Glasziou	Medical graduate entering academia (statistics, clinical epidemiology and decision making)	Considerable expertise in methodology for very large general practice clinical trials. Has re-written the standard text on clinical decision making, and developed and promoted the discipline of EBM before moving to the Centre for Evidence Based Medicine in Oxford, UK.
Helena Britt	Psychology	Continued and expanded the investigation of general practice activity (commenced by Charles Bridges-Webb) through the BEACH program.
Gawaine Powell-Davies	Philosophy	Research and evaluation of integration of care, particularly for chronic disease and service integration involving general practice.
Andrea Mant	Clinical general practice	Influences on prescribing policy through the Pharmaceutical Benefits Advisory Committee, and prescribing practice through the National Prescribing Service.

for general practice researchers to collaborate with other researchers and disciplines to create a broader base of skills and methodologies in keeping with the complex nature of whole-person care that is fundamental to general practice.

5.3.4 What is being researched in Australian general practice?

The first comprehensive review of Australian general practice research was conducted in 2000, and spanned the two decades from 1980 through to 1999 (Ward et al. 2000). The topics of the research were categorised according to the International Classification of Primary Care (ICPC, see Glossary for explanation), and are shown in Table 5.4. However, fewer than half the research publications were focused on *clinical* topics and able to be classified using this internationally recognised system.

Only about one-third of the articles focused on the National Health Priority Areas (NHPAs: cardiovascular health, cancer control, injury prevention and control, mental health, asthma and diabetes). Cancer control accounted for 15% of the research initially, with the proportion doubling over the two decades. Mental health research accounted for 10%, and the other NHPAs combined accounted for less than 10%. Research on rural populations accounted for a constant 16% of the research in both decades (Ward et al. 2000).

About one-quarter of the research addressed ‘GP behaviour, views and opinions’ (Table 5.5). This category included screening, preventive health and promotion, prescribing, counselling and many other activities common in general practice. The ‘education and training’ category included both undergraduate and postgraduate education research. The ‘encounter’ category included the AMTS (see Table 5.1), clinical epidemiology studies, clinical presentation studies and Health Insurance Commission (HIC) data analyses. The ‘other’ category included studies not able to be classified elsewhere, and evaluation studies of national health promotion campaigns (Ward et al. 2000).

Table 5.3 Australian GPs contributing to public health research

Researcher	Background	Most important contributions
David Weller	General practice academia	General practice perspective to bowel cancer screening (previously dominated by specialists). Appointed to Professor of General Practice at Edinburgh University, the first established chair in general practice worldwide.
Jeanette Ward	General practice education	Population health aspects of preventive care and the use of clinical guidelines.
Chris Silagy	General practice academia to academic public health and health service delivery	Established the Australasian arm of the Cochrane Collaboration and was responsible for a large component of its general practice flavour.

Table 5.4 Publications^a by ICPC category, 1980–89 and 1990–99

	1980-1989 (n=117)		1990-1999 (n=546)	
	No.	%	No.	%
Psychological	20	17	65	12
Female genital (Pap smears, mammograms)	3	3	37	7
Respiratory	1	1	36	7
Pregnancy, child bearing, family planning	5	4	20	4
Skin	1	1	22	4
Circulatory	5	4	17	3
Endocrine, metabolic, nutritional	4	3	16	3
Digestive	2	2	12	2
General and unspecified	3	3	8	2
Male genital (eg prostate screening)	1	1	8	2
No ICPC category applied	69	59	282	52

ICPC = International Classification of Primary Care

^a Categories with fewer than 1% of articles in both time periods (musculoskeletal, neurological, social problems, blood, blood-forming organs, immune mechanisms, eye, urological, ear, hearing) are not listed.

Source: Ward et al. (2000)

Table 5.5 Publications by type of research, 1980–89 and 1990–99

	1980-1989 (n=117)		1990-1999 (n=546)	
	No.	%	No.	%
Encounter and clinical epidemiology studies	28	24	66	12
GP behaviour, views, opinions	27	23	153	28
Education and training	15	13	81	15
Patient behaviour, views, opinions, compliance	15	13	34	6
GP and patient behaviour	10	9	62	11
Workforce	7	6	14	3
Organisation of general practice	5	4	31	6
Health services interface	4	3	51	9
Research methodology	2	2	20	4
Finance	1	1	7	1
Ethical/legal/professional	0	–	5	1
Evidence-based medicine	0	–	3	1
Other	3	3	19	4

Source: Ward et al. (2000)

Of projects funded under the General Practice Evaluation Program (GPEP), 24% focused on characteristics of the services provided by GPs, and the relationship between these services and the health needs of the population from the perspectives of consumers, GPs, and funders (NIS 2000). Research on quality of care issues, including the relationship between vocational registration and quality of care, accounted for 17% of the projects, and 15% of the projects investigated issues relating to the interface between GPs and other health service providers, (Table 5.6). Of total GPEP projects, 32% were related to the NHPAs.

The majority of GPEP funded research (80%) has provided necessary information about general practice in Australia, consistent with GPEP's original brief: economic analysis, development of new ways of organising the delivery of care, and specific program evaluations. Only 10% of projects provided evidence that GPs could use in their daily work with patients; for example, 'Guidelines for assessing postnatal problems' and 'Guidelines for consent issues in young people' (Ewald and Askew 2001). Too much research seems to be irrelevant to either the clinical needs of GPs, or priorities set by the Australian community.

5.3.5 How much Australian GP research is there?

It is difficult to accurately measure how much Australian GP research exists. One way is to count publications, but this misses unpublished research. For example, up until 2003, 59% of completed GPEP projects, despite apparently successfully discharging funding obligations, were yet to be published in the biomedical literature (Libby Kalucy, Primary Health Care Research and Information Service, pers comm, 2003).

Table 5.6 Classification of GPEP projects by GPEP evaluation framework, 1990–1999

	No. projects	%
Supply and distribution	23	5
Service characteristics	121	24
Practice organisation	31	6
Quality	87	17
Education and training	67	13
Ethical/professional/legal	17	3
Health services interface	77	15
Financial	16	3
Methodology	62	12
Total	501	100

Note: most projects have been allocated to more than one category as they cover a broad range of subject areas.

Source: NIS (2000)

Nevertheless the amount of general practice research is increasing. There was a five-fold increase in the number of published Australian general practice research papers from the 1980s to the 1990s, with an associated increase in international publications (Figure 5.2; Ward et al. 2000). This increase is also occurring internationally. For example, general practice research publications in the Netherlands increased ten-fold between 1983–87 and 1988–92 (Knottnerus 1996). Some of the reasons for this increased research productivity are:

- the maturation of the discipline (including capacity building)
- an international quality-driven agenda based on evidence-based health care
- the general increase in research across all health disciplines.

Despite the increased general practice research productivity, comparison with research productivity of other disciplines is disappointing. During the 1990s there was only one publication per thousand GPs per year — two orders of magnitude lower than for other disciplines (Figure 5.3; Askew et al. 2001).

An indirect indicator of general practice research activity is the proportion of GPs with postgraduate qualifications. A study by Pearce et al. (2003) found that the majority of GPs (56%) do not have postgraduate qualifications in general practice (Fellowship of the Royal Australian College of General Practitioners (FRACGP) or the Australian College of Rural and Remote Medicine (FACRRM), or equivalent). Research postgraduate degrees (postgraduate diplomas, Masters degrees or PhDs) were held by 15% of GPs and 18% of specialists. Specialists were more likely to have PhDs than GPs (3% and <1%, respectively) whereas GPs were more likely to have a Masters degree (5%) compared to specialists (1%). This study did not investigate the number of MDs held within each discipline. However there is little evidence (anecdotal or empirical) that would suggest many GPs hold this qualification.

There are significant barriers to GPs pursuing formal postgraduate qualifications, while many specialists are able to undertake formal postgraduate studies as an integral component of their specialty training. The majority of practising GPs do not have the opportunity to take study leave or receive payment for undertaking formal study. Additionally, many postgraduate courses are expensive. Hence undertaking a formal course of research is difficult at a time in a GP's career when building a business, a family, or both may take precedence.

5.3.6 What research methods are used?

The majority of Australian general practice research is observational — 57% in the 1980s, increasing to 68% in the 1990s. Descriptive studies with no analytical component accounted for 41% of the published research during the 1990s. One-quarter of the research in this decade involved an intervention, but only 5% were randomised controlled trials (Ward et al. 2000). This pattern is similar in the UK: between 1991 and 1996, 48% of general practice research publications were concerned with administration, organisation or social problems, more than 50% were either qualitative studies or surveys of opinions or attitudes, and only 6% were randomised controlled trials (Thomas et al. 1998). Of Australian GPEP funded projects, 85% (210/248) were descriptive, and the remaining 15% (38/248) involved an intervention and an experimental comparator (NIS 2000).

This balance of research methods can be criticised. The large evidence gaps described above (Section 5.2.1) suggest that general practice research is needed for the multitude of clinical and social science questions to be answered. That is, we need a greater range of research methods applied to primary care: multi-method approaches, qualitative, epidemiological, cohort studies, randomised controlled trials and research synthesis. Alternatively, much research and evaluation effort has been directed at examining the impacts of systems reforms emanating from the GP strategy from 1992 onwards. This has inevitably led to a large number of observational survey-based studies and evaluations.

5.3.7 Research on versus research in general practice

Too often the driver for general practice research is external, and involves GPs merely as sources of data collection. This has been described as 'intellectual and professional colonization' (O'Dowd 1995). Even though this sort of research might answer important general practice questions, there is little chance of GPs feeling responsible for the results, or even being intellectually stimulated.

Nevertheless, research is technically demanding. Some of it must be undertaken by professional researchers (eg social and behavioural scientists, biostatisticians, epidemiologists, health economists) who may well not be clinicians (Table 5.7; Jones 2000). Many questions require a multidisciplinary approach. The challenge is to find a way to combine GP ownership of research with the necessary expertise to ensure quality.

5.3.8 The quality of the general practice research

Quality can be measured in different ways. Good general practice research (indeed all health care research) should lead to improvements in health. However, this will happen only if the research is of *high scientific quality* and *relevant* so it can be effectively implemented by clinicians and policy makers (Van Weel 2002). Scientific quality is commonly (if imperfectly, see below) measured through analysis of the scientific impact of publications and journals. Relevance is even more difficult to measure, although the Netherlands has recently developed criteria and indicators for measuring the societal impact of research (Royal Netherlands Academy of Arts and Sciences 2002, Smith 2001, Van Weel 2002).

Table 5.7 Dimensions of primary care and primary care research

	GPs & general practices	General practice networks & university departments	Secondary care specialists	Health services research, policy & Public Health
Epidemiology & natural history	±	+	±	+
Patients & care-seeking behaviour	+	+		±
Clinical presentations & clinical epidemiology	+	+	±	±
Doctor-patient interventions & clinical decision making	+	+		
Screening/ prevention & health promotion	+	+	+	
Primary-secondary care interface	±	+	+	+
Organisation primary care	±	+		+
Primary care policy	±	+		+

Symbols: +, major key dimension for primary care; ±, minor key dimension for primary care; blank, not a key dimension for primary care.

Source: Jones (2000)

International publication could be seen as a measure of quality if it is assumed that rigorous and generally applicable research is more likely to be published internationally. However, paradoxically, to reach local GPs, research must be published in journals that GPs access and read (Van Weel 2002). Most GPs read national rather than international journals. Only about one-quarter (145/546) of the Australian general practice research published in the 1990s appeared in the *Australian Family Physician*, the only Australian general practice journal that has Medline indexing (and which is sent to all Australian GPs who are members of the RACGP or who subscribe) (Ward et al. 2000).

Publishing in general medical journals is a good index of quality for the same reasons as international publication. Although the *British Medical Journal (BMJ)* includes a section devoted to primary care research, few other general medical journals do. For example, out of 90 original research articles published during 1999 in the *Medical Journal of Australia* (Australia’s leading general medical journal), only 3% were from general practice, compared with 37% from other fields of medicine (Askew et al. 2001).

The impact factor of a journal is the ratio of the number of times its publications are cited by other journals to the number of articles it published within the previous two years. However, it is an imperfect measure (Smith 1998). In particular, there may be a bias towards fundamental and strategic health research and against applied health research journals (Royal Netherlands Academy of Arts and Sciences 2002). Nevertheless, the relative impact factors of journals influence the academic status of the journal, the discipline, and the careers of researchers within it (Lundberg 2003). Most general practice journals rank poorly (if at all) relative to other international and national medical journals on the citation index (Table 5.8).

Table 5.8 Impact factor of some journals

• Medical Journal of Australia	1.79
• Australian Family Physician	Not indexed ^a
• Journal of the American Medical Association	17.57
• British Medical Journal	6.63
• Journal of Family Practice (USA)	2.14
• British Journal of General Practice	1.42

^a Not all journals, even if indexed with Medline, are included in the citation index.

Source: available online at <http://isi8.isiknowledge.com/portal.cgi> (accessed 21 January 2003)

5.3.9 GP attitudes to, and involvement in, research

Most GPs (84%, 389/463) have positive attitudes to research, particularly younger ones. However, fewer than half (48%, 223/462) are aware of their access to Medline, even though the 89% with internet access automatically have free access to the Web-based version, PubMed. Most have recruited patients into research projects, but few have received any formal research training, or been principal investigators. Very few GPs have any current involvement in research and only 30% want more involvement (Figure 5.4; Askew et al. 2002).

Barriers to involvement in research include the general practice environment (especially fee-for-service funding), and the culture of general practice (the perception that questioning is not encouraged, and a GP mind-set that assigns higher authority to clinical experience than research evidence). Perceived enabling factors for research participation include academic mentors; opportunities to participate in reputable, established research activities relevant to general practice; and access to information resources (Askew et al. 2002).

5.4 International comparisons

General practice or primary health care (PHC) research has increased in other countries, reflecting an international trend towards primary care-oriented, evidence-based health care systems. These trends are important, as Australia seems to be moving in a similar direction, creating opportunities for collaboration.

5.4.1 United Kingdom

During the 1990s, research in general practice and primary care in the UK became established, driven largely by the University Departments of General Practice/Primary Health Care. Bolstered by the Mant Report on *Research and Development in Primary Care* (Mant 1997) and the Medical Research Council (MRC)'s *Topic Review on Primary Health Care* (MRC 1997), the National Health Service (NHS) Research and Development Program and the MRC provided considerable additional funding. The Mant Report led the Minister of Health to a commitment to increase the research and development expenditure on PHC research to £50 million per year by 2002–03. At the time of writing, the annual spend on PHC research is approximately £35 million, which includes research programs, projects, infrastructure and personal award schemes (Cliff Bailey, Head of

R&D, Department of Health and Social Care North, pers comm, 2003). The MRC Topic Review was followed by a joint nonrecurrent MRC/Department of Health funding initiative for research into PHC. This involves two programs and 21 projects, worth £9.3 million.

A 2001 survey of the 31 UK University Departments of General Practice/Primary Health Care found 248 full-time equivalent (FTE) researchers employed on fixed-term contracts — an average of 8 per department, with a range from 3.5 to 21.5. The great majority (81%) were nonclinical researchers. These departments also supported 82.5 FTE research training fellows, of whom the majority (70%) were from clinical backgrounds (Heads of Departments of General Practice and Primary Health Care 2002).

Research practices and networks have been a further catalyst to the growth of PHC research, the development of research capacity and the fostering of quality research (see Section 5.4.6). Other initiatives have included the establishment of the National Primary Care Research and Development Centre (NPCRDC) in Manchester and the recent creation of the virtual Scottish School of Primary Care.

The NPCRDC is a multi-disciplinary centre, established in 1995 by the Department of Health, with funding for an initial ten-year program of policy-related research on primary care. The centre is a collaboration between the Universities of Manchester and York, with the main base at the University of Manchester.¹

The NPCRDC aims to:

- conduct high quality research relating to primary care
- disseminate the research findings widely
- inform PHC policy
- support the development of PHC
- develop research capacity in primary care.

Research at NPCRDC is organised into three themes of work:

- investigating the potential of primary care to improve population health and reduce health inequalities
- governance, workforce and partnerships of primary care organisations
- quality in healthcare — the delivery of quality primary care and the promotion of effective self care.

The Scottish School of Primary Care is the national organisation promoting research and building research capacity in primary care across Scotland. Funded by the Scottish Executive Health Department, the school is part of the new Health Education Board for Scotland. It is still in its developmental foundation stage, and is supported by a wide range of organisations committed to the development of primary care research and development.²

The school will develop and coordinate research programs, with the specific aims of:

- providing the high quality research evidence needed to inform decisions made by patients, practitioners, managers and policy makers
- increasing research capacity through improved access to education and training in primary care research.

The school will add value to the research activities currently being undertaken in universities, other research institutes, networks, practices and NHS Trusts by:

- coordinating research activities around a number of important research programs and cross-cutting themes

- helping to identify gaps in current research in relation to the research programs
- stimulating collaborative research between disciplines and institutions to develop research within the program areas
- stimulating, developing and obtaining resources for new work within the research programs
- increasing awareness of research which relates to the programs
- considering ways of improving implementation of research findings.

5.4.2 Canada

The Canadian Institutes for Health Research are virtual institutes that work on a partnership model. Their four pillars of research are:

- biomedical science
- clinical science
- health systems and service
- social, cultural and other factors affecting the health of populations.

Research in PHC in Canada is relatively underdeveloped. The Canadian Health Services Research Foundation did not fund projects in PHC before 2001. The Canadian Government established Primary Health Care Transition Funds in 1997, spending CA\$150 million over three years. The Health Transition Fund and several provinces (Alberta, Nova Scotia and Ontario) are funding primary care reform pilot projects. In 2002 there was an allocation of CA\$800 million over four years and there was a call for primary care researchers to apply for some of these funds.³

5.4.3 United States

In 2002 in the United States, the National Institute of Health spent more than US\$20 billion on research, but only US\$0.27 billion on the Agency for Healthcare Research and Quality (AHRQ, the only agency charged with primary care research).⁴ The AHRQ awarded US\$3 million in 2002 for developmental grants to 36 primary care practice-based research networks (PBRNs). As part of this funding, seven awards for pilot projects or feasibility testing were made for up to US\$100 000 annually for up to two years of funding. Representatives of recipient PBRNs are expected to attend two to three group meetings convened annually by the AHRQ during the funding period. Funding beyond the initial budget period will depend on an annual progress review by the AHRQ and the availability of funds.⁵

Although PHC is relatively underdeveloped in the USA, the North American Primary Health Care Research Group (NAPCRG) is very successful and productive, hosting the largest PHC research conference in the world. The NAPCRG is a multidisciplinary organisation for primary care researchers in the United States, Canada and throughout the world. Founded in 1972 and oriented to family medicine, NAPCRG welcomes members from all primary care generalist disciplines and related fields, including epidemiology, behavioural sciences and health services research. The goals of NAPCRG⁶ are to:

- increase the discipline's capacity for conducting quality research
- provide appropriate forums for presentation of original primary care research work
- enhance communication among primary care researchers using a variety of technologies
- guide and support synergy among primary care research, education and patient care.

5.4.4 New Zealand

The main funder of health research in New Zealand is the Health Research Council (HRC). In 2001–02 it allocated NZ\$39.5 million for expenditure over a maximum of three years for three investment strategies:

- Strategy one: investing in strategic research which contributes to social, economic and knowledge goals (NZ\$31.5 million).
- Strategy two: enhancing the HRC's role within the health sector (NZ\$4 million minimum). Research and development strategies in mental health and diabetes have been established in partnership with the Ministry of Health. Strategies are being developed in immunisation and Pacific health. Strategies are being planned in disability and rehabilitation, Maori health, health services and cancer control.
- Strategy three: establishing partnerships to add value to the HRC's investment (NZ\$4 million minimum).

Funds were allocated through a number of joint research portfolios (JRPs) developed in partnership with a range of stakeholders. So far, JRPs have been established in environmental health, the socioeconomic determinants of health, and occupational health and safety, and further JRPs are being planned in food, nutrition and health, and biotechnology.⁷ Research in PHC accounts for 7.2% of HRC total investment (Bruce Scoggins, Director, HRC, pers comm, 2003).

5.4.5 The Netherlands

The Netherlands has established a school of Primary Care Research (CaRe). This is a collaboration of three universities (Maastricht, Amsterdam and Nijmegen) and an extra-academic national research institute (Netherlands Institute of Primary Health Care: Nivel). The CaRe school is formally established at the Medical Faculty at Maastricht and is acknowledged by the Royal Netherlands Academy of Sciences (KNAW). In 2001, the school had a total annual turnover of A\$A17.5 million.

The scientific mission of CaRe is two-fold:

- to perform high quality research in primary care (extramural) and at the interface of primary care and hospital care (transmural)
- to train researchers who are able to develop and conduct high quality primary care research.

CaRe specifically aims to enhance quality and efficiency of research and research training in:

- health promotion and illness prevention
- the occurrence, course and consequences of chronic disease, and living with chronic illness
- effectiveness of extramural and transmural health care
- quality and organisation of extramural and transmural care.

A nationwide research network of mostly computerised primary care practices supports the field intensive research in which most research is conducted in real practice settings. In this context, about 400 practitioners are actively involved both in collecting data and in developing and executing research programs.

The CaRe research program has a multidisciplinary basis, with contributions from general practice, epidemiology, clinical specialties and biomedical sciences, health sciences, social sciences, health economics and health policy, health ethics and law, and nursing sciences. In 2001, 68 FTE senior researchers from these disciplines were involved in the CaRe program. They are responsible for selecting, training, teaching and coaching PhD students (234 in 2001). A steadily increasing number of theses are being completed in the CaRe program — 28 in 1995; 55 in 1999; and 66 defended in 2001 alone.⁸

There are two fields of training for CaRe PhD students: clinical and epidemiological research, and social and behavioural research. The PhD training program consists of three elements: PhD study, general scientific and methodological courses, and domain-specific courses covering the field of primary care and interface research.⁹

5.4.6 Research networks

Research networks have been very important in establishing research participation in a number of countries, including Israel, France, the Netherlands, countries of eastern Europe, the USA, UK and New Zealand (Green et al. 1994, Van Weel et al. 2000, Thomas et al. 2001). They have been referred to as the 'research laboratory' (Green and Dovey 2001) of general practice, providing ongoing opportunities for GPs to: identify research priorities and engage in research within their own practices, facilitate dissemination and implementation of research findings, and enable multidisciplinary research teams to address diverse research agendas (Thomas et al. 2001). Networks are supported by a separate organisational structure that goes beyond a single study.

Research networks benefit individuals, the discipline and society by:

- facilitating involvement in research by GPs and other primary care providers
- facilitating collegiality between GPs interested in participating in research
- providing a forum for research skills development
- facilitating the development of the necessary critical mass to answer general practice research questions
- contributing to the general practice body of knowledge through clinical, social, and health services research (Dunbar 2001).

In 2001, the World Organization of Colleges and National Academies (WONCA) Task Force on Research established the International Federation of Primary Care Research Networks (IFPCRN). The mission of the IFPCRN is to support research in PHC for the benefit of patients by:

- the mutual support of research networks
- the exchange of ideas and methodologies
- advocacy for the quality of research in primary care
- capacity building
- policy and advocacy initiatives
- doing collaborative research.

Membership in the IFPCRN has developed rapidly, and now includes 60 individuals and representatives of networks or planned networks in 18 countries (Australia, Austria, Belgium, Canada, China, Fiji Islands, Ireland, Korea, Lebanon, Mexico, Malaysia, the Netherlands, Pakistan, Scotland, Singapore, South Africa, the UK and the US). Thus, Australia is an active participant in the global development of primary care research capacity and activity. The IFPCRN has established a listserver through WONCA's Global Family Doctor and a website.¹⁰

5.5 Emerging areas

Much research is generated through the particular interests of investigators. However, there is some pressure to research areas of direct policy relevance, particularly where more evidence is needed to support policy development and evaluation. This section examines some emerging key areas in this context.

5.5.1 Rural health research

Over the last decade, rural health has emerged as a discrete discipline, while retaining its strong links with general practice. Rural health is viewed by policy makers as a broad discipline, with a focus on PHC, with the development of multidisciplinary collaborations and the development of flexible and coordinated services (see the ACRRM website,¹¹ Hays 2002). This emergence

Table 5.9 Rural health ‘research’ articles published per year, 1990–1998

	1990-1992	1993-1995	1996-1998	Total
Australian Journal of Rural Health	N/A	24	48	72
Medical Journal of Australia	18	24	29	71
Other Journals	30	67	120	217
Total all Journals	48	115	197	360

Source: Patterson (2000c)

followed research that showed a need for a distinct discipline (Strasser 1995) and happened at a time of heightened political responses to rural disadvantage. Within this context, broad categories of research activity have been identified (Strasser et al. 2000):

- health status, morbidity and mortality
- rural health services, including population health and PHC
- workforce issues
- specific clinical tasks and services
- Indigenous health.

Before the 1990s, research productivity was very low (Humphreys and Rolley 1991), but, since then, both the amount and diversity of research have increased (Patterson 2000b). The first systematic overview of Australian rural health research publications from 1990 to 1998 identified a modest but increasing number of publications — a total of 360 in nine years, (Table 5.9; Patterson 2000c). Only about half the articles involved authors from non-metropolitan institutions (Patterson 2000a). GPs and general practice issues contributed to 24% (87/360) of the rural health research output of the 1990s (Ward et al. 2000).

Funding for rural health research increased commensurately during the 1990s. Funds are derived from conventional sources such as the National Health and Medical Research Council (NHMRC) as well as from targeted programs such as the Rural Health, Support, Education & Training (RHSET) program, the General Practice Rural Incentives Program, Divisions of General Practice and GPEP (Patterson 2000c). Conventional sources and Divisions of General Practice were the major contributors to rural health research (39% and 31%, respectively), although the Divisions of General Practice contribution is underestimated because it does not include data from 1998 (Table 5.10).

Most research funded by conventional funding bodies is for public health issues (68%), with some clinical (16%) and health services (16%) research (Patterson 2000c). Publications follow a similar pattern: most are about public health (77%), with some on health services (40%) and clinical research (21%); much, of course, fits into more than one category (Patterson 2000a). These figures disguise the fact that the rubric ‘rural’ encompasses many other emerging issues, especially Indigenous (Section 5.5.2) and workforce (Section 5.5.3) problems.

Richard Hays (2002) has described the many unique and rewarding features of practising medicine in rural Australia. The relationship between general practitioners and their communities, the dynamics of small communities and issues of isolation can both facilitate rural research and make it more challenging. Rural doctors are often held in high regard by their communities and this can increase community acceptance of, and participation in, individual research efforts. On the other

Table 5.10 Funding sources for rural health research, 1991–1998

	1991–1992	1993–1994	1995–1996	1997–1998	Total A\$m	%
Conventional ^a	6.16	6.34	8.31	4.69	25.5	39
GPEP	0.42	0.33	0.35	0.09	1.19	02
Divisions of General Practice	N/A	5.55	11.07	4.03 ^b	20.65	31
RHSET program	--	0.57	1.39	0.72 ^b	2.68	04
Other government	1.73	1.55	8.00	4.71	15.99	24
Total	8.31	14.34	29.12	14.24	66.01	

GPEP = General Practice Evaluation Program; RHSET = Rural Health Support, Education & Training

^a Conventional funding sources included: NHMRC, Public Health Research Development Council, Healthway health promotion funding WA, Rural Industry Research and Development Corporation, Victorian Health Promotion Council

^b Data available for 1997 only
Source: Patterson (2000a)

hand, working in small isolated communities can make some study designs, such as randomised controlled trials where the unit of allocation is the practice or community, more difficult to organise. Given the strength of rural community networks and communication channels, some elements of good research practice, such as maintaining double blind trial methodology, can also be more problematical than in other settings (Hays 2002). In addition, the uniqueness of many rural communities makes it difficult to generalise from locally-based health services research. The continued development of research capacity in rural health will require ongoing encouragement, support and resources.

5.5.2 Indigenous health research

Aboriginal and Torres Strait Islander populations have significantly higher burdens of illness and die at a much younger age than non-Indigenous Australians (AIHW 2002b). Around two-thirds of Indigenous people live in country areas (where they constitute 3% of the population in rural, and 21% in remote zones). It is not surprising, then, to find that one-third of all rural health research published during the 1990s was about Indigenous health (Patterson 2000a).

5.5.3 Workforce issues

People living in regional, rural and remote areas have reduced access to GPs and other health services — there are 20–30% more people per GP in rural areas, and 50% more in remote areas (Larson 2002). This has caused considerable effort and resources to be directed to the education, training and support of GPs and other health professionals in rural and remote areas. There are also initiatives to improve recruitment and retention of the rural health workforce.

Research has been directed at these issues, and has provided valuable information about them, including the workload of rural doctors, workforce projections, and work satisfaction in rural practices (Strasser et al. 2000). In addition, evaluation of government programs directed at rural workforce issues has added to research activity and knowledge building in these areas.

5.5.4 Other emerging areas

Complementary therapies is an area of emerging research interest in general practice. Many GPs are regularly confronted by patients who are either taking, or contemplating taking, complementary treatments, often where conventional treatments have been unhelpful. These patients rely on the GP to 'legitimise' or at least advise on such therapies. GPs need an evidence base from which to draw their advice. Use of acupuncture, hypnotherapy and herbal therapy is widespread in Australia, and is coupled with an increasing number of mainstream GPs incorporating a range of such therapies into their clinical practice (Myers 2002).

Inequality of health care access is another emerging issue. The greater burden of disease associated with low socioeconomic status is a research priority area for general practice and PHC (Kalucy et al. 2001). Some Divisions of General Practice have been involved in developing multilevel strategies to address this, particularly through the National Innovations Funding Pool (see Section 5.8.5) (Furler et al. 2002, Furler and Harris 2003). These innovative projects have demonstrated the need for better systems of data collection and aggregation such as income/disadvantage mapping, around factors that determine inequities.

People with disabilities require special care and its provision is an emerging area of general practice research. This need will probably steadily increase with current de-institutionalisation (Beange and Bauman 1990), particularly of people with chronic mental disabilities as well as those with physical disabilities. University centres (such as the Queensland Centre for Intellectual and Developmental Disability) aim to improve the health of adults with an intellectual disability through research and service provision. For example, the Comprehensive Health Assessment Program, a guide for GPs and other professionals, was developed from extensive research into the health management needs of adults with intellectual disabilities and has been demonstrated to improve the quality of health care delivered to these people.¹² In addition, primary care researchers have been prominent in demonstrating the 'inverse care law' whereby those most disadvantaged have most difficulty accessing care (Furler et al. 2002, Furler and Harris 2003, Hyndman et al. 2003).

Alternative models of PHC delivery are another research area (Bryant and Strasser 1999). Australian general practices are run as private companies, but in small rural and remote communities, returns are generally inadequate to attract or sustain GPs. Many rural communities have populations of less than 1000, and it is difficult to support a general practice based on fee-for-service (Lyle 2002). Consequently, research is needed to explore other ways of providing primary medical care such as through state or territory governments, or to Aboriginal community-controlled health services (meeting the special needs of Indigenous people) and the Royal Flying Doctor Service (delivering medical services to communities too small and isolated to support a resident GP). In some remote areas of northern, western and central Australia, government-employed district officers provide primary medical care; in others, public health physicians fulfil this role (Lyle 2002).

5.6 The general practice research workforce

There are three broad elements of the GP research workforce. First are GP academics who have chosen to pursue a career dominated by research interests. Second are GPs who participate in research as a 'sideline' to their main work, usually clinical practice. Third are the additional professionals needed to support research activity, such as statisticians and research assistants. Included in this group are a number of academics from other disciplines who choose to focus, either totally or in part, on GP issues. These could be economists, social scientists, academic nurses or social geographers. This section explores this workforce.

5.6.1 Who are the researchers of general practice?

The majority of general practice research emanates from universities (62% of the research published in the 1990s), and the majority of this (38%) from university departments of general practice (Ward et al. 2000). In December 2000, the 11 university departments of general practice had only 34.3 FTE core academic staff positions funded by the Commonwealth Department of Education, Training and Youth Affairs (DETYA). They spent on average one-quarter of their time on research (Kamien 2001). That is, a grossly disproportionate amount of Australian general practice research was conducted by the equivalent of nine academic staff.

Hospitals, the RACGP and 'others' were responsible for the remaining 38% of the Australian general practice research published in the 1990s (12%, 7% and 16%, respectively). The category 'others' includes health departments and the Divisions of General Practice; however, the Divisions of General Practice published less than 1% of the research (Ward et al. 2000). GPs were co-authors of 39% and 36% of research conducted on general practice by other nonGP academic departments and hospitals, respectively. In summary, 64% of all published general practice research included GPs as authors (Ward et al. 2000).

By 1 September 1999, 162 GPEP projects had been completed and reported to the NIS. Of these, 61% of chief investigators were GPs, 33% were nonclinicians (statisticians, social scientists, epidemiologists, health economists etc) and 6% were consumers. Half (210/417) of the total GPEP researchers were GPs, nonclinicians accounted for 44% (185/417), and just 3% (12/417) were consumers. The remaining 10 researchers were unclassified (Graham Lyons, National Information Service, pers comm, 2000).

5.6.2 Australian Association of Academic General Practice

The peak association of academic general practice is the Australian Association of Academic General Practice (AAAGP or A3GP). It has approximately 120 members, including those at the forefront of health research and medical education in the Australian community. This body represents a membership in academia where most senior researchers are based. It provides information to others, maintains an internal discussion group, encourages general practice research and is committed to building the research capacity of the wider general practice community. Since the 1999 Annual General Meeting, it has hosted an annual research meeting to provide a forum for researchers to develop their research knowledge and skills. This places a strong emphasis on research methods, rather than simply publishing research outcomes. At the completion of each meeting, recommendations are provided to the Commonwealth Department of Health and Ageing (DoHA) regarding research in general practice and means of enhancing working relationships between the department and research organisations such as A3GP.¹³

5.6.3 Royal Australian College of General Practitioners

The RACGP has a longstanding objective to promote and encourage research. Despite this, research has not always been perceived as a priority activity of the college. However, recently, changes have re-established research as a core business, supported by the following:

- a National Standing Committee to provide advice to the college council on research related matters
- a research funding program, consisting of a variety of grants and awards (the Cardiovascular Research Grants, the Family Medical Care Education and Research Foundation Grants, the Chris Silagy Research Scholarship and the Alan Chancellor Award)

- the National Research and Evaluation Ethics Committee (a properly constituted NHMRC-standard institutional ethics committee)
- the GP Registrars Association, which provides information and support to registrars interested in research; the Registrar Scholarship and Research Fund (originally the responsibility of the RACGP, but now General Practice Education and Training Ltd) sponsors individuals to attend an annual Registrar Research Workshop, funds competitive research grants and scholarships, and awards the annual Registrar Research Prize
- state-based RACGP research units in Queensland, New South Wales, Victoria, South Australia and Western Australia, which conduct a range of research and evaluation activities, including clinical trials.¹⁴

Examples of research activities of the state-based research units include the following:

- Australian Sentinel Practice Research Network (ASPREN) is a network of GPs who fill out (weekly) a supplied form for each time they see a patient with one or more of the medical conditions under investigation by ASPREN. The data from this assist in the monitoring of, and research into, diseases in the community and the detection of trends in consultation rates. This is a continuing project, based in South Australia, with activity in all states.
- The Urinary Incontinence Trial, which examines an anticholinergic drug in the management of urinary urgency and urinary incontinence. It focuses on the occurrence of adverse events and improvements in the quality of life on undergoing treatment in a general practice setting. It is being conducted in South Australia, Western Australia and Victoria.¹⁵

5.6.4 Divisions of General Practice

The Divisions of General Practice are becoming increasingly involved in research. They must use research and evaluation methodologies to demonstrate the delivery of outcomes in the current Outcomes Based Funding systems (McIntyre 2002). Additionally, Divisions of General Practice are developing the research capacity of their members and staff, sometimes in collaboration with university academic units.

In 1999–2001, many Divisions of General Practice (43/123) reported specific strategies aimed at improving the research and evaluation capacity of their members: 18 Divisions of General Practice involved university departments of general practice or rural health (under the auspices of the PHCRED strategy); 13 engaged in a research project; and five participated in local research committees (McIntyre 2002).

Staff or members of 78% of Divisions of General Practice (93/123) attended events aimed at improving the divisions' research, evaluation and development capacity in 2000–2001. External research and evaluation expertise was used by 72% (88/123) of Divisions of General Practice in 2000–2001, compared with 78% in 1999–2000. Most frequently, university departments of general practice/community health were used (33%), but also departments of rural health, rural clinical schools and other university departments (28%). Private consultants and state based organisations were used by 30% and 22%, respectively (McIntyre 2002).

Nearly all Divisions of General Practice (98%) survey their members, but only 66% of Divisions of General Practice consider the data to be 'very useful'. Similarly, HIC data were used by 94% of Divisions of General Practice for monitoring and evaluation of their programs, although such data was considered 'very useful' by only 57%. However, practice staff surveys and patient registers were considered to be 'very useful' by 72% and 77% respectively (McIntyre 2002). The gathering and use of information such as this by Divisions of General Practice represents a

continuum between formal research and evaluation and monitoring of programs and interventions. Some Divisions of General Practice have been willing to formalise these monitoring activities into research formats for conferences presentations and/or publication.

5.6.5 Consumer involvement in general practice research

Consumers are the ultimate reason for the health care system. Their input to general practice research is not just valuable but essential. Any issue under investigation can have an impact on consumers' everyday life in a highly personal and significant manner — they can contribute passion, enthusiasm, interest and individuality of experience (Bastian 2002).

The Consumers' Health Forum of Australia (CHF) and the NHMRC worked in partnership with consumers and researchers to develop the Statement on Consumer and Community Participation in Health and Medical Research, published in 2002. The statement on participation is intended as a guide to consumer and community participation at all levels and across all types of health and medical research. It recognises that consumers should be actively involved as equal partners in all stages of the research — the development of the research goals, questions, strategies and methods, conducting the research and dissemination of the outcomes.¹⁶ Some of the ethical issues around the involvement and recruitment of consumers in research are discussed in Chapter 12.

The following features of consumer and community involvement in research have been identified by Macaulay et al. (1999):

- The knowledge, expertise, and resources of the involved community are often the key to successful research.
- Participatory research is based on a mutually respectful partnership between researchers and communities.
- Partnerships are strengthened by joint development of research agreements for the design, implementation, analysis, and dissemination of results.
- Three primary features of participatory research are collaboration, mutual education, and acting on results developed from research questions that are relevant to the community.
- Results of participatory research have both local applicability and transferability to other communities.

5.7 Evaluation of Australian Government programs and initiatives

Australian Government programs are usually funded for a four-year period. Ongoing funding depends on a positive evaluation of what has been achieved, with recommendations for alterations to program structure and funding. This evaluation includes an assessment of usefulness of the program to policy development.

5.7.1 Impact of research on policy

Research can influence policy from two directions: it can provide the evidence to inform the development and implementation of policy or it can evaluate the impact of policy changes. The Coordinated Care Trials (CCTs) and the After Hours Primary Medical Care (AHPMC) trials are examples of the former, and the Enhanced Primary Care Medical Benefits Schedule (EPC MBS) item evaluation is an example of the latter.

Other examples of research informing policy include the evidence-based approach taken by the Joint Advisory Group on General Practice and Population Health to develop a consensus statement on the role of GPs in population health, and a strategic framework to progress this (Harris and

Mercer 2001). Airing of research about the association of consultation length and quality general practice (Howie et al. 1989, Howie et al. 1991) has contributed to the debate around how general practice funding should be structured.

There are many other pilot studies funded by the federal and some state governments exploring better ways of delivering services and reducing disease burdens. Examples include the bowel cancer screening pilot studies and the primary care collaborative initiatives announced in the 2003–04 budget. Most government-sponsored research results in reports to government — not all of it becomes public. Some pilot studies result in published material such as consensus statements and drug and service utilisation studies.

Policy-makers need to ensure that maximum impact is gained from limited health resources and research can facilitate this assessment. Significant consultancies commissioned by the Australian Government have informed the development of policy, but this can set a research agenda sometimes at odds with those of both academic and service GPs (see Section 5.3.3). This tension arises from the key primary driver for the evaluative research being the need to demonstrate accountability for public spending, creating a potential discrepancy between what the government sees as priority research and what the research community values. To this end, the PHCRED strategy incorporated a mix of priority-driven and investigator-driven funding pools. Additionally, evaluation of government initiatives is inherently political. There are often delays in accessing necessary information, the release of the evaluation reports is controlled to some extent by the government, and a surprisingly limited number of publications (particularly in the more accessible journals) emanate in relation to the funding levels. This contrasts with the researchers' desire to publish all, regardless of the result or debate that might ensue.

The following sections will focus on the implementation and evaluation of three Australian Government programs aimed at health services reform, and one activity aimed at changing clinical practice.

5.7.2 Coordinated Care Trials

In 1994, the Council of Australian Governments (COAG) developed a framework for health care reform. On the basis of individual need, they identified three streams of care, one of these being coordinated care, which was designed to meet the needs of people with chronic care needs who require a mix of services for a long period of time (eg people with chronic illness such as diabetes or renal failure, or people requiring extended rehabilitation) and who could benefit from having their overall care systematically coordinated and managed.

Prior to the wholesale introduction of these reforms, nine CCTs commenced in 1997 and concluded at the end of 1999. The level of involvement of GPs varied from being the central care coordinator through to simply being a medical consultant. The aims of these trials as stated in DHAC (1999b) were:

- improved client outcomes
- better delivery of services which are individually and collectively more responsive to client's assessed needs
- more efficient ways of funding and delivering services.

The trials were designed and evaluated within a rigid, hypothesis-driven framework. However, the trials tended to continue evolving during their lifespan as they responded to lessons learnt. This limited the ability of the final evaluation to assess the final outcomes in relation to the original hypotheses. Lessons learnt through the evaluation (DHAC 1999b) included:

- There was no common understanding of ‘coordinated care’ between trials, thus limiting the generalisability of results.
- The greatest impact of care coordination was felt when a new service provider (a ‘coordinator’) was introduced into the system.
- The potential impact of funds pooling to improve efficiencies was constrained due to limited understanding of effective strategies in this context.
- The legacies of the CCTs for individuals and organisations involved include increased knowledge about service provision and the formation of inter-organisational and inter-sector networks that will be useful for future collaborative activities.

Building on the outcomes of the first round of trials, the federal government is supporting a further round of CCTs. Key features of the new round of CCTs as agreed by the Australian health ministers in August 1999 are:

- a continued focus on exploring approaches to improved care within existing resources
- a focus on increased consumer empowerment
- better targeted care coordination
- further exploration and development of best practice disease management approaches and evidence-based protocols for multidisciplinary care
- improving primary and community care services, as well as coordinating across the acute and primary care sectors
- development of effective partnerships between general practice and nonmedical primary and community care
- further exploration and development of flexible funding arrangements
- exploring the involvement of residential aged care.

The trials will also explore alternative forms of health insurance to support community-based care for people with private health insurance.¹⁷

There are five second-round CCTs currently in progress. GPs are involved in all trials, but the type and level of participation varies considerably, depending on the nature and location of the trials. For example, one of the second round CCTs is sponsored and managed by a Division of General Practice, and aims to give GPs the means to better manage chronic illness in the community.¹⁸ One of the other trials, run by the Jawoyn Association Aboriginal Corporation, will test innovative approaches to providing care for communities in the region east of Katherine, where general practice care is generally provided by visiting District Medical Officers employed by the Northern Territory Government (DoHA, pers comm, 2003). The trial is premised on the important principles of community control and capacity building, and is targeted at the whole of the population in the region.¹⁹ The second-round trials remain in progress at the time of writing.

5.7.3 Enhanced Primary Care Medicare Benefits Schedule items

In the 1999–2000 budget, the federal government introduced the EPC MBS items. The intention of these items was to:

- provide more preventive care for older and Indigenous Australians
- improve care coordination between GPs and other health professionals
- provide better care for people of any age with chronic conditions and complex care needs.

EPC MBS items provide a framework for a multidisciplinary approach to health care through a more flexible, efficient and responsive match between care recipients' needs and services.

The government commissioned an evaluation of the EPC MBS items, and the associated GP Education, Support and Community Linkages program. The components of the evaluation of the EPC items are:

- strategies to promote awareness, use and uptake of the EPC MBS items
- provider and consumer satisfaction with the EPC MBS items
- impacts on practice by GPs and other health and community care providers
- changes to systems of health care delivery through use of EPC MBS items
- impacts on quality of health care and responsiveness to the needs of consumers.

The evaluation team initially conducted a scoping study to gain an overview of the education, support and community linkages activities of Divisions of General Practice and state based organisations. The main phase of the evaluation used descriptive, quantitative and qualitative methodologies (Wilkinson et al. 2003). The final evaluation report, published in July 2003,²⁰ concluded that the EPC MBS items have made a significant contribution to improving the management of patients with chronic illness and complex needs in general practice in Australia. Uptake of the items was variable, both in terms of quantity and quality, but there is evidence to suggest that a fundamental shift in general practice towards a more structured approach to multidisciplinary care has occurred (Wilkinson et al. 2003).

5.7.4 After Hours Primary Medical Care trials

Concerns from both the medical profession and the government about the delivery of general practice after-hours medical care led to the government funding four AHPMC trials. The AHPMC trials aimed to evaluate different local models of service provision and coordination and assess their relative feasibility in terms of wider application (Centre for Health Program Evaluation 2002).

The national evaluation, commissioned by the government, used a before–after design, in conjunction with monitoring broader trends. The evaluators used a national comparator that excluded the trial areas, as well as nationwide data and time-series data for the periods prior to and during the trial in the trial areas. The goal of the national evaluation was to determine the extent to which AHPMC trials removed, or reduced, the obstacles to the provision and use of effective after hours care through coordination of high quality services (Centre for Health Program Evaluation 2002). The general findings of the evaluation were:

- AHPMC trials were generally highly acceptable to the users, and reduced the desire for home visits.
- MBS after-hours items were reduced in some trials.
- High levels of accessibility and acceptability of the telephone triage services were found.

Of particular note was the finding that local after-hours services should be developed in response to the identification of local need. Provision of after-hours services in Australia is not entirely dysfunctional, and often does not require any local or government response. The experiences of the local trials in the AHPMC trials (their different models implemented in different geographical and social environments) provide extensive information for local service providers who are considering the development of local after-hours service arrangements (Centre for Health Program Evaluation 2002).

5.7.5 Prostate Specific Antigen Academic Detailing Project

The Prostate Specific Antigen (PSA) Academic Detailing Project is investigating the potential for academic detailing, described below, to positively impact on GP knowledge and appropriate use of the PSA test. It is funded by DoHA's Health Access and Financing Division, monitored by the National Cancer Control Initiative and undertaken by the Drug and Therapeutic Information Service (DATIS).²¹ DATIS is an initiative of the Repatriation General Hospital, Daw Park, South Australia and the School of Pharmacy, University of Queensland and has a record of changing GPs' clinical practice through the provision of academic detailing about quality use of medicines (May et al. 1999).

The PSA Academic Detailing Project uses academic detailing methods to deliver information about the issues surrounding prostate cancer and the use of the PSA test in general practice. Academic detailing involves one-to-one visiting of medical practitioners by trained professionals who discuss patient-management issues of concern to the doctor and provide commercially-independent advice and information based on current evidence about the topic. Academic detailing has been demonstrated to be effective in changing clinicians' behaviour, particularly their prescribing behaviour (Thomson O'Brien et al. 1997).

A systematic approach is being employed to test the impact of academic detailing in this project. The project is being undertaken in Queensland, Victoria and South Australia. In Queensland, the acceptability of academic detailing to GPs is being assessed. In Victoria, a randomised controlled trial is assessing different strategies for delivering the academic detailing, and the South Australian arm is testing whether previous exposure to an academic detailing visit influences subsequent detailing visits by DATIS.²²

The PSA Project commenced in 2001, and the evaluation phase was planned for completion in 2003. Results are being finalised at the time of writing.

5.8 Current investments

Research cannot occur without funding. The development of GP research in Australia has been made possible through considerable investment by governments, mostly, but not only, the federal government. This funding has not only been directed at research grants but at building infrastructure and capacity such that general practice can bid effectively for wider funds through programs such as those of the NHMRC. This section explores that investment.

5.8.1 The shift from GPEP to PHCRED

The establishment of the GPEP has been well documented in the previous editions of this book, and therefore is only briefly discussed here. The decision to introduce a system of vocational registration of GPs was contentious, resulting in an unforeseen debate between the government, RACGP and Australian Medical Association (AMA). The debate was referred to a purposely established Senate Select Committee on Health Legislation and Health Insurance. When the committee reported, it supported the introduction of vocational registration of GPs, and the concomitant official recognition of general practice as a discrete medical discipline. The Senate Select Committee also proposed establishing a mechanism for evaluation of the GP reforms. The Senate Select Committee inquiry recommendations for evaluation of vocational registration (Bollen and Saltman 2000) covered the following:

- the effect of vocational training for GPs on patterns of practice
- the effect of the way doctors are paid on their patterns of practice

- the effect of continuing medical education and quality assurance on patterns of practice
- measures of patient outcomes in terms of quality of health care and standards of health.

Amongst the recommendations of the committee, the one of most significance to this discussion was that the Australian Government provide adequate funding to enable the evaluation to occur (Doessel 1990). Subsequently, an Evaluation Steering Group was established, and they, in turn, established a discrete research grant process, GPEP, within the department to focus on these evaluation questions as well as to fund research grants in general practice (Bollen and Saltman 2000).

Through GPEP, A\$12 204 209 was provided between 1990 and 1999 to fund 248 projects — an average of about A\$50 000 per project. The GPEP research grants were either ‘seeding’ or ‘project’ grants. The former were for a maximum of one year, and intended for novice general practice researchers and for assisting in identifying research questions, trialling innovative methodologies and determining direction for future research. Project grants were allocated to comprehensive evaluative research, aiming to analyse aspects of the quality and outcomes of general practice care. Seeding grants attracted 8% of the GPEP funding, and project grants the remaining 92% (NIS 2000).

The annual GPEP conference was the main forum for the dissemination of outcomes of GPEP funded research. The conference has been attended by Australia’s leading general practice researchers, including both GPs and research scientists of varying levels of seniority and experience from university departments, government, Divisions of General Practice, the RACGP and other GP organisations (DHAC 2000).

In addition to the vocational registration of GPs in 1989, Australian general practice underwent a number of reforms during the early 1990s, referred to under the umbrella title of the General Practice Strategy. At the request of the RACGP and the AMA, the government agreed to review the strategy. The Strategy Review Group was formed and reported back to the department in early 1998 with a total of 174 recommendations, several of which focused on research and development (DHFS 1998).

At about the time of this review, a strategic review of research and development in primary care had been undertaken in the UK. The report, known as the Mant Report after the chair of the working group, was considered by the review group to be particularly relevant to Australia — much of the report’s material was adopted unchanged and used to underpin and inform their recommendations (DHFS 1998).

The Mant Report (Mant 1997) identified an ‘evidence gap’ that limited the provision of quality health care in four spheres of clinical activity in primary care:

- recognition and clinical management of the early presentation of disease
- clinical management of established disease treated predominantly in primary care
- clinical management of chronic disease, which occurs predominantly in primary care
- assessment and clinical management of disease risk.

The review group recognised that while some of the evidence needed to support clinical decision making in general practice can be generated in the secondary and tertiary care sectors, the majority of the necessary evidence can only be obtained from GPs and their patients. However, for this to occur there needed to be a major increase in the amount of research conducted, a concomitant large injection of funds, and an increase in the research capacity of general practice (DHFS 1998). To this end, the review group proposed five strategic principles and a number of associated recommendations. These five principles (DHFS 1998) were:

- high quality patient care requires a sound evidence base derived from high-quality research and development
- high-quality research and development requires effective collaboration between health service providers and universities
- any increase in general practice research and development activity in the health services sector requires parallel expansion of research and development capacity in the university sector
- successful expansion of primary care research and development requires a coordinated approach from the (then) Department of Health and Family Services, the NHMRC, universities, and other research-funding organisations
- expansion of research and development activity in general practice should be carefully managed.

The review group recommended that these strategic principles be adopted and supported to create a research-based culture in general practice. The associated recommendations were:

- replacement of GPEP with a broader General Practice Research, Evaluation and Development (GPRED) program that is focused primarily on targeted areas of research and development with clinical and/or policy relevance
- development of research capacity within the general practice workforce by funding, for example, postdoctoral scholarships, establishment of ‘general practice career scientist’ posts, and strengthening the research base of academic departments of general practice
- support for nonclinical general practice researchers to develop their expertise in key areas of general practice research
- active encouragement and support for consumer involvement in general practice research, evaluation and development
- divisional networks to be utilised fully, particularly in areas such as patient-based data collection, development of evidence-based clinical practice guidelines, and development of models of applying best evidence
- divisional business and strategic plans incorporate research, evaluation and development as identifiable components.

Professor Peter Mudge was commissioned in 1998 by the (then) Department of Health and Family Services to recommend feasible strategic options to advance the recommendations of the Strategy Review Group. Oceania Health Consulting was then commissioned to conduct a second consultancy to propose an implementation plan for primary care research, evaluation and development which took into account the recommendations of the Strategy Review Group, the Mudge Report (Mudge 1999), the principles and relevant findings of the Will’s Review of Health and Medical Research (Commonwealth of Australia 1999a) and the Review of the Public Health Education and Research Program (PHERP) (Commonwealth of Australia 1999b). The then Minister, Dr Michael Wooldridge, asked the General Practice Partnership Advisory Council (GPPAC) to design a new primary care research strategy that took all of this information into account. The Minister took this into account when approving the PHCRED strategy.

The PHCRED strategy was endorsed by the government in April 2000. Through PHCRED, a total of A\$50 million was allocated to build capacity in PHC research, evaluation and development. This allocation was initially intended to be made over five years, but this timeframe was subsequently extended for a number of major PHCRED initiatives. The initial five-year funding acknowledged the significant work that needs to be done in addressing barriers to practitioner involvement in research; in training individuals in research; and in supporting and consolidating the evidence-based approach in PHC.

5.8.2 The Primary Health Care Research, Evaluation and Development strategy

The PHCRED strategy aims to embed a research culture in Australian general practice and PHC. It focuses on general practice as a core element of the Australian PHC system, while recognising the increasing importance placed on the integration and collaboration of general practice with the broader PHC sector. The principles underpinning the PHCRED strategy²³ are:

- Decisions made in PHC should be evidence-based. EBM involves the critical application of current best evidence to the care of individual patients (Sackett 2000).
- PHC is central to our health system. The majority of health contacts in Australia occur in general practice and PHC. Most serious illnesses first present in general practice, and most major, and almost all minor, illnesses are managed in the PHC sector. Most preventive health care, including screening for illnesses and childhood immunisation, also occur in this setting (DHAC 2000).
- The evidence base for PHC needs to be strengthened. There are identified evidence gaps limiting the provision of quality care in general practice and PHC, and there is limited capacity to generate the evidence needed to address these gaps. In order to deliver evidence-based care in this setting, the evidence base for primary care will therefore need to be strengthened.

The major components of the PHCRED strategy are:

- a PHC research priority setting process
- funding for PHC research, evaluation and development capacity building to university departments of general practice and departments of rural health
- establishment of a national PHC research institute
- a general practice and PHC research program, encompassing investigator and priority-driven research, as well as scholarships and fellowships.

The PHC research priority-setting process aims to assist in the development of a more strategic approach to PHC research, managed through a program of priority driven research, and to guide research undertaken through other components of the strategy (Kalucy et al. 2001).

The Primary Health Care Research and Information Service (PHCRIS) was commissioned by the government to conduct stage one of the process. Stage one involved obtaining structured input from key stakeholders including PHC providers (general practice and others), researchers (general practice, rural health and others), consumers and relevant government representatives.

Seven thematic areas were identified as priorities for research, with each requiring clinical, health services and health systems research. None of the areas was deemed to be more or less important, and they should be perceived as being interrelated (Figure 5.5). Vulnerable groups in the community requiring a PHCRED focus were also identified (Kalucy et al. 2001). These were:

- Australians in rural and remote areas
- Aboriginal and Torres Strait Islander communities
- vulnerable or 'hard to reach' communities, particularly those experiencing disadvantage due to health and/or socioeconomic/cultural factors, such as people with chronic illness, carers, homeless people and adolescents.

Eighteen university departments of general practice and of rural health (UDGP and UDRH) were funded for five years for research capacity-building activities — research skills development, the development of research networks, and actual research. The funding recipients have all taken individual approaches to building research capacity based on their expertise and the needs of

their constituents, resulting in a range of activities. Collaboration between recipients and across programs is therefore a priority to meet the demands posed by the complex and multidisciplinary research needed to address the evidence gaps. The main areas of UDGP and UDRP activity are:

- training of research leaders
- providing opportunities for participation in research
- facilitating deliberate and explicit use of research findings
- establishing and maintaining a supportive infrastructure.

To train research leaders, many funding recipients have established research bursaries or fellowships to provide clinicians with protected, funded time to develop research skills while engaged in research projects. Simultaneously, they are provided with academic mentoring, support and supervision, and access to university resources such as libraries and equipped workspaces.

Opportunities for involvement in research have been facilitated through a number of different research networks with different focuses and collaborative research projects. Various funds recipients have also developed a range of education and training opportunities such as research skills (eg qualitative and quantitative research, data management and analysis, and EBM); evaluation methods; and development training (eg critical thinking, writing for abstracts and for publication, and project management).

The main avenue for facilitating deliberate and explicit use of research findings has been EBM workshops, but evidence-based practice clubs, critical analysis workshops and workshops on searching electronic databases have also been popular.

As a result of PHCRED, the UDGP and UDRHs have increasingly been perceived as reputable sources of information and academic assistance about general practice and PHC research, evaluation and development. Collaborations are forming between the UDGP, UDRHs, Divisions of General Practice, local community health services, hospitals, nongovernment organisations, state-based institutions, and other university departments. Individual practitioners are also seeking avenues for research. Box 5.1 gives a summary of some of the activities of PHCRED.

The Australian Primary Health Care Research Institute (APHCRI) is a collaborative and virtual institute. It will play a pivotal role in providing leadership for PHC research in Australia, through providing relevant and effective research to underpin the development of high quality PHC services and systems and will play a key role in providing evidence to inform national policy.

The APHCRI is developing a 'hub and spoke' format. The hub will be a small academic/secretariat unit located within the Australian National University, led by a director with a small number of research and administrative staff. The spokes will be a variety of organisations and institutions engaged in PHC research. The APHCRI recently announced its first funding processes that will involve two streams of activity. Stream one activity will provide funding under a competitive model for up to A\$80 000 as a one-off grant. This stream is aimed at providing projects that are already substantially underway with additional funds to undertake additional research that might bring pilot schemes into useable policy possibilities — a value-adding exercise. It is anticipated that activity funded from stream one will be under way in the second half of 2004 and completed by end of year. Stream two is a two-part process where proposals for seeding money will be assessed if the seeded activity will lead to a major program of research work of policy relevance to commence in early 2005. It is expected that not all seeded proposals will lead to major funding. A multidisciplinary multi-site model is preferred. It is anticipated that around six such networks will be funded. Total funding is A\$10 million.²⁴ It is proposed that the APHCRI will:

- develop networks, partnerships and collaborations; the APHCRI will consult, engage, cooperate and disseminate widely across the range of stakeholders in the PHC sector: the end users (communities and consumers, and practitioners), peak bodies, commercial organisations, researchers and institutions, and policymakers
- bring into being, and operate within, a strategic plan that focuses on priority-driven research, research enhancement, its dissemination and uptake
- operate within the ANU's internal governance and management structures, and within governance arrangements required under the agreement with the federal government
- publish the results of research it sponsors
- develop and administer an open, transparent and accountable assessment process for the allocation of research funding
- manage conflict of interest or commitment issues, perceived or actual, in accordance with best practice.

The Primary Health Care Researcher Development Program has been funded up to A\$1.5 million to support the development of PHC researchers through New Researcher Placements in the UDGP and UDRHs. Its objectives (DoHA 2002b) are:

- to develop a number of PHC researchers who are:
 - skilled and able to undertake applied research and evaluation
 - able to address PHC issues in policy and strategy areas
 - able to work collaboratively with practitioners, consumers and researchers from other disciplines
- to increase the number of PHC workers who have research knowledge and skills they can apply to everyday life.

The New Researcher Placements have been allocated to the UDGP and UDRHs by DoHA on a competitive basis. The individual departments will then fill the placements through a transparent recruitment and selection process. The new researchers will be able to initiate their own research, or become part of a team of researchers on an existing project.

The types of research projects the new researchers will be able to undertake include:

- literature searches
- data collections and statistical analyses
- writing a research paper
- analysing under-utilised databases
- investigating a small research question
- conducting an evaluation
- developing a research proposal.

The first cohort under this program started in early 2004.

The PHCRED research program, encompassing investigator and priority-driven research as well as scholarships and fellowships is administered by the NHMRC. The NHMRC Primary Health Care Project Grants program provides additional dedicated funding support for PHC research and is intended for:

- applied research of relevance to policy makers, planners and service providers that could lead to improvements in the delivery of PHC
- strategic, integrated and multidisciplinary research that addresses the identified priorities for PHC research in Australia.

The Primary Health Care Project Grants were advertised for the first time in December 2001, at the same time as the standard NHMRC Project Grants. The applications were assessed using the

Box 5.1 Summary of selected activities in the second year of funding under the PHCRED strategy, from the 2002 annual reports of the 18 UDGP's and UDRHs

Teaching

- 12 departments coordinated or contributed to teaching in university courses at all levels.
- Five departments were involved with the Population Health Education for Clinicians (PHEC) program.
- Supervision and mentoring took place in 15 departments and was provided to 49 PhD students, 24 Masters students and 82 other students (eg higher degree students, registrars, clinic attendees, grant holders).

Research networks and collaborations

- 14 departments were managing 20 research networks involving more than 630 people.
- These collaborations (all departments) occurred with:
 - other university departments (both within the same university and/or with departments in other universities [all departments])
 - Divisions of General Practice (16 departments)
 - health services (14)
 - other research and health service organisations (15)
 - overseas organisations (5).

Network and other activities

- 18 departments held 272 educational activities attracting over 4478 participants.
- 132 different types of activities were reported, with some departments offering the same or similar workshops on several occasions to meet the demand and others offering a series of workshops on related issues.
- Educational activities were devoted to:
 - research skill building (offered by all departments)
 - appraising and using research (15 departments)
 - evaluation (14 departments)
- Nine departments had established research practices and services.
- Resources developed included:
 - PHCRED website section or website
 - online courses and modules
 - online guides
 - handbooks, guidelines, resource kits and information sheets (non-web-based)

Note: Issues such as the lack of a shared understanding of definitions and different model interpretations make summarising of the annual reports challenging. Readers should be aware of this when reviewing the above information

Source: Ellen McIntyre, PHCRIS, at PHCRED university initiative national meeting, Canberra, October 2003.

Box continues...

Box 5.1 Summary of selected activities in the second year of funding under the PHCRED strategy, from the 2002 annual reports of the 18 UDGP's and UDRHs

- In-kind support included membership on committees, boards, and working parties, administrative support, promotion of activities and resources, venue facilities, academic teaching, journal review panel, and consultation.

Research funding

- 98 research projects were funded to a total of over A\$9 276 804 in 11 departments (four departments did not state how much funding they had received and three departments did not indicate whether they had received any funding).
- The success rate of grant applications and tender submissions ranged from 0% (0/3) to 70% (16/23) in the 11 departments where sufficient data were provided; the mean success rate was 38%.
- 17 departments reported 200 internally funded research projects.
- 14 departments awarded 30 bursaries, 22 fellowships 19 seeding grants and 6 scholarships.

Research effort

- 17 departments conducted 298 research projects, with at least 73 being collaborative projects.
- 15 departments published 183 peer-reviewed papers and 36 non-peer-reviewed papers.
- 15 departments made 191 presentations at conferences and seminars..

Note: Issues such as the lack of a shared understanding of definitions and different model interpretations make summarising of the annual reports challenging. Readers should be aware of this when reviewing the above information

Source: Ellen McIntyre, PHCRIS, at PHCRED university initiative national meeting, Canberra, October 2003.

normal NHMRC assessment process, plus an expert group established by the department. Only applications ranked by the NHMRC Discipline Panels as meriting funding, but which fell below the NHMRC's funding level, were considered by the expert group (DoHA 2002a).

In November 2002, a total of 415 NHMRC Project Grants were awarded, with 26 (6%) being for PHC research, and involving about A\$11 million. Of these 26 projects, nine were funded through the Primary Health Care Project Grant program and were allocated around A\$2.5 million (DoHA, pers comm, 2003; see Section 5.9.2).

Details of the allocation of project grants for PHC research by state and discipline of the chief investigators are presented in Table 5.11.

The NHMRC Primary Health Care Scholarships and Fellowships aim to support the development and strengthening of the general practice and PHC research and evaluation workforce. The awards provide financial support in the early to mid-stages of research careers to those who are seeking to strengthen their research skills, and to support researchers seeking to make a contribution to the knowledge base of PHC.²⁵

In 2001, the first year of the program, two NHMRC Primary Health Care PhD scholarships commenced. The following year, four scholarships commenced, along with one fellowship.²⁶

Table 5.11 Chief investigators of NHMRC Primary Health Care Research Grants, 2003

State/Territory	No. projects	Primary Health Care	Non primary health care
Queensland	3	1	2
Western Australia	1	1	0
Victoria	5	0	5
Northern Territory	1	0	1
South Australia	4	1	3
Australian Capital Territory	2	1	1
New South Wales	10	3	7
Total	26	7	19

NHMRC = National Health and Medical Research Council
 Source: GPInfonet (2003)

5.8.3 Rural health academic departments

Despite the increased funding for rural health research and the growing amount of published research, GP involvement in rural health research remains low. The structure of general practice in Australia makes it difficult for GPs to become involved in research, and this situation is more pronounced for rural doctors because of workforce shortages and the greater demands of clinical practice and service delivery in the country. Given this situation, it is not unexpected that academic departments and research centres are the major recipients of research funding grants and produce the bulk of the research outputs in rural health (Patterson 2000c, Ward et al. 2000). Thus, the Australian Government's decision in 1996 to establish UDRHs in rural and remote communities in each state and the Northern Territory. More recently, rural clinical schools in larger regional centres have provided greater capacity for rural health and medical research.

The UDRHs are each affiliated with a metropolitan-based medical school, with several health professional training programs, with respective state health services, nongovernment health organisations (eg Royal Flying Doctor Service, and Aboriginal Community Controlled Health Services) and with rural health professional organisations such as the ACRRM and rural Divisions of General Practice (Humphreys et al. 2000). Affiliations with urban-based UDGP and other research units, and research collaborations among the UDRHs are still being developed. These linkages also have the potential to increase the capacity and opportunity for rural health and medical research.

5.8.4 National Innovations Funding Pool

To support the ongoing development of general practice and Divisions of General Practice, DoHA provided funding of approximately A\$8.1 million for 82 projects across 50 Divisions of General Practice through the general practice National Innovations Funding Pool (NIFP). The NIFP comprised two submission-based funding rounds, which commenced in 1999 and 2000. The NIFP was aimed at Divisions of General Practice and provided time-limited funding to support innovative ways of improving general practice and/or aspects of PHC, outside of the main

Outcomes Based Funding stream. Although the NIFP was not specifically a research funding program, it has been included in this discussion because many projects were highly developmental in nature and included significant evaluative components.

The key areas of innovation of the first round included new roles for GPs and general practice; new partnerships across jurisdictional boundaries; a focus on disadvantaged groups, particularly Aboriginal and Torres Strait Islander peoples and the aged; enhancing quality care and evidence-based practice and improving divisional management and data management. In the second round, these were consolidated to focus on PHC integration, population health, information management and technology, and rural health.

The Australian Divisions of General Practice administered and conducted a process evaluation of the NIFP. Overall, the outcomes of the NIFP demonstrate the Divisions Network is interested in innovation and has the potential to initiate and drive change in the PHC system. The Divisions of General Practice responded to opportunities and pressures for reform with a diverse range of funded projects, including targeting disease areas, population issues, systems issues, practice and cultural mores. This diversity and lack of strategic focus of the NIFP as a whole limited its potential to inform the PHC reform agenda. Additionally, a number of projects were conducted in circumstances that limited their potential for success, including insufficient capacity of some Divisions of General Practice to undertake complex system-wide projects.

Despite these limitations, there were a number of useful lessons learnt from the projects conducted through the NIFP program.²⁷ Projects focusing on under-served or disadvantaged groups were often extremely innovative, and frequently worked hard at addressing cross-cultural issues at the community and practitioner level, before establishing new partnerships in practice. Also, projects that reoriented their aims and objectives, or brought in new or needed expertise in response to difficulties arising during the course of the project often allowed new understandings of a health issue faced in the community, or established new collaborations for undertaking future work.

5.8.5 Academic General Practice Registrar Posts

Academic General Practice Registrar Posts give GP registrars the opportunity to develop academic skills in planning and evaluation of teaching and student assessment, project work and research activities.

In 1999, the equivalent of three full-time posts were offered on a trial basis, taken up by six part-time registrars. These could be taken for six months full-time (a maximum of eight sessions per week) or 12 months or longer part-time (a maximum of five sessions per week) (Catherine Speechly, Registrar Research and Development Officer, General Practice Registrar Association, pers comm, 2003). The evaluation of this trial indicated that, despite some administrative problems, the posts were very positively received by the registrars, the academic supervisors and the (then) RACGP training program, with perceived benefits for the registrars, the universities and the entire general practice discipline. The report concluded that the posts have the potential to contribute to a cohort of GPs with aspirations for academic activity, scholarship and research (Garside 2000).

The academic registrar posts have continued to be available since 1999. In 2000, the maximum of three FTE posts were filled by five registrars. In 2001, the program was extended to the rural clinical schools and 11 registrars filled the six FTE posts (maximum) funded by the training program.

With the changes to general practice training, the registrar posts are now administered by General Practice Education and Training (GPET). In 2003, GPET made available 10 FTE positions,

which have been taken up by 14 GPET registrars, with additional posts commencing in July 2003 (Catherine Speechly, Registrar Research and Development Officer, General Practice Registrar Association, pers comm, 2003). In addition to the GPET funded posts, there are other, but very limited, opportunities for academic registrar posts. For example, the Victorian Department of Human Services funds two half-time, 12-month, advanced academic registrar positions in the departments of general practice at Melbourne and Monash universities (ie a total of four positions annually).

5.8.6 The National Institute of Clinical Studies

The National Institute of Clinical Studies (NICS)²⁸ was established in December 2000 as a means of assisting the transfer of research ('closing the gap') from the library shelf into clinical practice. It is funded by the DoHA with A\$1.5 million committed to establish the institute and a further A\$3.5 million per year for three years to implement its plans.

The NICS aims to provide a national focus to champion continuous improvement in the quality and delivery of clinical practice to the Australian community, by fostering a scientific approach to the implementation of evidence. It works in partnership with consumers, healthcare professionals, researchers and organisations to develop practical resources to support clinicians in providing best clinical practice. The NICS has focused on the development of guidelines and decision aids to disseminate research findings, and works with organisations to create an environment in which these resources can be used effectively (Silagy 2001).

5.9 General practice research expenditure

While there is no doubt that research spending in general practice has increased, it remains a relatively small component of overall health expenditure. This section looks at that expenditure in an international context.

5.9.1 Background: health and health research expenditure

Total health expenditure in Australia in 1999–2000 was A\$55.7 billion or 8.8% of gross domestic product (AIHW 2002a). This is a smaller proportion than in the United States, Canada, France or Germany, but more than in Japan, New Zealand and the United Kingdom. Total expenditure on health research in Australia in 1999–2000 was A\$944 million, which was 1.7% of total health expenditure. The Australian Government funded most (66%) of this (Figure 5.6). State and local governments provided 13% of funding for research and a further 21% was provided by nongovernment sources.

The Wills Report (DHAC 1999b), a strategic review of health and medical research in Australia published in 1999, triggered increased investment. This report showed that, in 1995, per capita annual public expenditure on health and medical research and development in Australia was only A\$28, ranking us ninth among twelve Organisation for Economic Cooperation and Development (OECD) countries (Figure 5.7).

5.9.2 General practice and primary health care research expenditure

Trying to establish a global figure for expenditure on general practice/PHC research is problematic for a number of reasons:

- overlap between general practice and PHC
- overlap between research and service development
- multiple sources of funding

- overlap between project funding, capacity building and infrastructure support
- some research in primary care is 'hidden' within larger DoHA programs, such as alcohol and drugs, HIV and health technology.

What is clear is that, from a previous low base, funding for general practice/PHC research is increasing. For example, between 1996 and 2000, general practice received only 35 (1.6%) of the 2116 newly funded NHMRC research projects, and a mere A\$3.7 million (0.5%) of the A\$795 million allocated to NHMRC-sponsored research activities (Greg Ash, Director, Research Policy, NHMRC, pers comm, 2003). In 2003, there were 26 NHMRC project grants in the area of PHC, accounting for A\$11 125 885 (see Section 5.8.3). Similarly, between 1990 and 1999 the government-funded GPEP allocated about A\$13 million towards general practice research and evaluation, that is A\$1.3 million per year (see Section 5.8.1). The recent NIFP program that supported Divisions of General Practice in development and evaluation projects funded 82 projects over two rounds at a cost of A\$8.1 million (see Section 5.8.3). Other general practice/PHC research is funded through state health departments, pharmaceutical companies and a variety of organisations and charities. The largest single recent injection of funding for general practice/PHC research has been the A\$50 million allocated to the PHCRED strategy in 2000 (see Section 5.8.2).

5.10 Dissemination and databases

Research can only inform and influence clinical practice if the findings are well disseminated and easily sourced. This requires a number of strategies from conference presentations, project reports, journals and database development. This need for dissemination has always been seen as an important part of the GP research approach in Australia and has provided the basis for several annual conferences. There have also been a number of searchable databases established for both academic research and evaluation reports, as well as hosts for these databases, and these are discussed here.

5.10.1 Evidence-based medicine

Evidence-based medicine has become an important process for all clinical medicine. It is one way in which research moves into clinical practice, although not the only way. Development of guidelines is another important way (see Section 5.8.6 on NICS). However, EBM is especially important for general practice. This is because of the self-reliance it allows GPs. They are able to determine the best evidence for clinical care with less dependence on specialist care.

General practice has been a major champion of EBM in Australia. Indeed Australia has been a major influence on the Cochrane Collaboration,²⁹ established in Australia by a GP academic (Professor Chris Silagy), and linked to a growing worldwide network of like-minded research groups. The Cochrane Collaboration seeks to systematically examine sets of research reports and assemble these into clear statements of the effect, or lack of effect, of clinical interventions. The Australian Government, through DoHA, purchased the Cochrane Library for all Australians in 2002.

5.10.2 Primary Health Care Research and Information Service

The PHCRIS is Australia's portal to a wide range of high-quality information about research, evaluation and development in general practice and PHC. Formerly the National Information Service (NIS), the PHCRIS is funded by DoHA. It collates research data from a wide variety of sources and provides a single point of access to information about Australian general practice (PHCRIS 2002). The PHCRIS aims to contribute to improved policy and practice by increasing the exchange of information about Australian general practice and PHC research, evaluation and

development, between researchers, practitioners, policy makers, and consumer organisations.³⁰ Information is disseminated in a variety of forms (PHCRIS 2002) to reach the widest possible audience, including:

- online by website or email alert
- publications, including *GPinfonet*
- conferences, seminars and workshops
- Help Desk hotline.

The PHCRIS website³¹ contains a range of features of relevance to general practice research, including:

- fully searchable online databases containing information about Divisions of General Practice, and general practice and PHC research funding through the GPEP program
- information about current grant and funding sources, plus other resources to support PHCRED
- links with relevant databases and websites.

GPinfonet, the bi-monthly newsletter, provides up-to-date information on PHCRED, GPEP and PHCRIS activities, as well as foreshadowing conferences and grant rounds.

JournalWatch aims to inform PHC policy and practice in Australia by presenting summaries of key recent research findings identified by the editor. Over 30 journals, most with a focus on PHC, general practice or public health, are monitored along with conference proceedings and other health and medical media (PHCRIS 2002).

The annual GP and PHC Research Conference, convened by the PHCRIS for DoHA, has become the key national event for anyone with an interest in PHC research, evaluation and development (tables 5.12 and 5.13). In 2003, 340 delegates from every state and territory in Australia attended the conference, representing academic departments of general practice and rural health, Divisions of General Practice, consumer organisations, federal and state government departments and other health and research organisations. Since 2002, pre-conference workshops have been offered on the day preceding the conference. More than 240 delegates attended pre-conference workshops in 2003.

The function of the conference is to:

- facilitate debate and discussion on key issues for general practice and PHC research, evaluation and development
- provide a forum for the presentation of:
 - GPEP projects
 - initiatives and projects funded through the PHCRED strategy
 - research and development work of the Divisions of General Practice
 - other current research relevant to the conference theme
- provide opportunities for networking with keynote speakers and researchers of international reputation in the area of general practice and PHC research
- offer pre-conference workshops on skill development relevant to research, evaluation and development in general practice and PHC
- support research involvement by PHC providers, policy makers and consumers.

The PHCRIS has recently been the subject of a review process. This has provided an opportunity to re-energise its role in research and evaluation over the next four years.

Table 5.12 Previous general practice and PHC research conferences

	Theme	Location and Dates	Attendance	Abstracts submitted
2004	What's [not] working? How do we know?	Brisbane, 2 – 4 June	312	174
2003	Primary Health Care Research: Evolution or Revolution?	Canberra, 18 -- 20 June	340	175
2002	Research – making a difference to health and health care	Melbourne, 31 May -- 1 June	274	158
2001	Embedding research into practice	Adelaide, 29 -31 May	270	131

PHC = primary health care

Table 5.13 Previous GPEP conferences

	Theme	Location and Dates	Attendance	Abstracts submitted
2000	Partnerships, health and community: General Practice and Primary Health Care in the New Millennium	Hobart, 4 -- 5 May	210	108
1999	Pathways to Quality in General Practice	Brisbane, 6 -- 7 May	227	123
1998	Forging Ahead – Facing the future	Sydney, 7 -- 8 May	228	99 ^a
1997	Challenges and Solutions	Melbourne, 1 -- 2 May	222	117 ^a
1996	A 3D Perspective on General Practice Evaluation – Diversity, Divisions & Dissemination	Sydney, 1-2 August	202	75 ^a
1995	Dissemination	Sydney, 24 -- 25 Nov	200	77 ^a

GPEP = General Practice Evaluation Program

^a Number of papers & posters presented

5.10.3 Statistical Clearing House

The Statistical Clearing House (SCH) is the central clearance point for all Australian Government-funded surveys and involves 50 or more businesses. The aim of the clearance process is to reduce the burden placed on businesses in completing government surveys, by eliminating duplication and ensuring that good practice is followed when designing and conducting business surveys. The SCH, operating from within the Methodology Division of the Australian Bureau of Statistics, monitors current statistical literature and identifies best practice methods that maximise the useability of the data at minimal cost. The SCH's website also has a reference section which includes a range of information likely to be of benefit to survey designers or practitioners, such as survey standards and guidelines, a glossary of terms, and international best practices.³²

Importantly, the General Practice Programs Branch (GPPB) can make available sample frames of GPs for surveys that are funded by the Australian Government and approved by the SCH. A modified synchronised sampling methodology, designed to minimise the probability that individuals will be selected in successive samples from the same population, is used for randomly selecting doctors grouped in strata agreed to in conjunction with the GPPB. This is important because each survey is likely to be differently stratified, and so the sample frames for different surveys may overlap. Consequently, a single doctor may be randomly selected for several samples, and precautions need to be taken to minimise the chance of this occurring (DoHA, pers comm, 2003).

5.10.4 The BEACH Project: Bettering the Evaluation And Care of Health

The BEACH project is a continuous national survey of general practice activity in Australia conducted by the General Practice Statistics and Classification Unit (a collaboration between the Family Medicine Research Centre, University of Sydney and the Australian Institute of Health and Welfare). It commenced in 1998, with the first report being published in October 1999, and reports have been published annually since then (Britt et al. 1999).

BEACH is a cross-sectional, paper-based data collection system. It has established an ongoing national database of GP–patient encounters based on results of an annual sample of 1000 GPs per year who record data from 100 consecutive patient consultations, a total of approximately 100 000 consultations annually. Variables collected include patient reasons for encounter, problems managed, medications and other treatment provided, referrals and tests ordered. Doctor statistics collected include age, gender, years in general practice, number of sessions per week, size and location of practice, computer use, and hours worked and on-call each week. Patient statistics collected include age, sex, postcode and ethnic background. Data on health status, risk factors and other selected topics are also collected and reported separately (Britt et al. 1999). BEACH is therefore able to provide information on general practice activity, health measures (eg body mass index) and estimates of the incidence of disease. Some BEACH reports³³ completed so far include:

- annual reports
- *Cardiovascular problems and risk behaviours in Australia 1998–2000*, which details the cardiovascular problems for the first three years of data collected in the BEACH program
- *Imaging orders by GPs in Australia 1999–2000*
- *It's different in the bush*; a comparison of general practice activity in metropolitan and rural areas of Australia 1998–2000
- *Pathology Ordering by General Practitioners in Australia 1998*, which describes pathology tests ordered by GPs during the nine-month period from 1 April to 31 December 1998
- *Measures of health and health care delivery in general practice in Australia*, which describes aspects of patient self-reported health taken from samples of 100 000 patient encounters with GPs.

The BEACH database is a unique resource that should be used by general practice researchers. It can be used when planning research, for determining the generalisability of a sample of patients or GPs, for measuring change, developing clinical guidelines, and identifying issues of quality for education and training at undergraduate, postgraduate and professional development levels. To date, it has been under-utilised (Britt 2002).

5.10.5 Other Australian general practice research databases

The General Practice Research Network (GPRN) is a computerised national network of approximately 300 GPs, established in August 2000. De-identified longitudinal patient data is collected directly from patient records of GPRN members to provide national prescribing data that are linked to condition and outcome. The GPRN data collected has been used for software development, doctor education, program evaluation and to monitor prescribing trends amongst GPs. The GPRN has considerable potential for pharmacoepidemiology and population health monitoring (Sayer et al. 2003).

The Australian Sentinel Practice Research Network (ASPREN) is operated by the Research and Health Promotion Unit of the RACGP. ASPREN aims to provide an indicator of the burden of disease in general practice, and to detect trends in consulting. It is a network of (currently) approximately 50 GPs from all states and territories who report presentations of defined medical conditions each week. The list of conditions is reviewed annually. In 2003, 13 conditions were being monitored, five of which were related to communicable diseases, and included influenza, gastroenteritis, antibiotic prescription for acute cough, varicella and shingles (Communicable Diseases Australia 2003).

The MEDIC-GP database, based at the Department of General Practice at the University of Adelaide, is a pharmacoepidemiological database comprising integrated anonymous data from six general practices in four states, and involves about 60 GPs. It contains 750 000 clinical records from nearly 51 000 patients collected over a four-year period (July 1994–July 1998). Examples of the applications of the MEDIC-GP database include monitoring of the natural history of diseases and adverse drug reactions, assessment of the costs of diseases or conditions, and implementation of studies of medication usage and effectiveness.³⁴

Although not primarily general practice-based, the Australian Women's Longitudinal study overlaps with GP research activity. Based at the University of Newcastle, the study is following a number of health issues in 40 000 women. It was originally funded by the Australian Government in 1995 for A\$10 million and is projected to run for 20 years. There have been many progress papers produced from the study.³⁵

5.11 Future directions: increasing the quantity and quality of general practice research

A recent invitational conference of WONCA, attended by 72 experts from 36 countries, including Australia, focused on improving health and wellness through strengthening family and general practice research throughout the world. The conference concluded that research must be directed at the health problems that impact most on patients' health and wellbeing and, to this end, sentinel monitoring systems are essential to monitor patterns of morbidity in the community. Based on a pooling of international experiences, the conference identified two models of particular value in driving research development, transferring expertise, building research capacity and changing the research culture — all of which are relevant to the development of Australian general practice research. These were:

- mentoring of aspiring researchers and institutions by experienced researchers
- PBRNs — although discussed above (see Section 5.4.6), it is worth reinforcing the contribution they can make; they facilitate:
 - the collection of data from clinical general practice
 - the transfer of research findings into patient care

- the generation of research questions from actual clinical problems
- the extension of academic research into the general practice community.

The conference made nine recommendations, representing a summary of the nine invited discussion papers and resulting small group sessions, for WONCA to address in order to increase the quantity and quality of general practice worldwide. The (selected) recommendations presented below are of particular relevance to Australia, and to some extent present a blueprint for action by governments, general practice colleges and representative organisations (eg Divisions of General Practice), UDGPs and UDRHs, research funding bodies, and individual GPs to strengthen the Australian general practice research culture. The recommendations were to:

- develop a strategy to display achievements in general practice research to policy makers, health insurance authorities and academic leaders
- seek the development of sentinel practices that report illness and diseases that have the greatest impact on patients' health and wellness in the community
- set up a clearing house for research expertise, training and mentoring
- set international ethical standards for international research cooperation and develop an international ethical review process
- set up an expert group to provide advice for the development of PBRNs
- ensure that any recommendations for general practice research also address the specific needs and implications for Indigenous communities.

Although some of these recommendations are in fact already being enacted through PHCRED and other initiatives, it is nevertheless worthwhile considering them collectively, as well as the interactions between them.

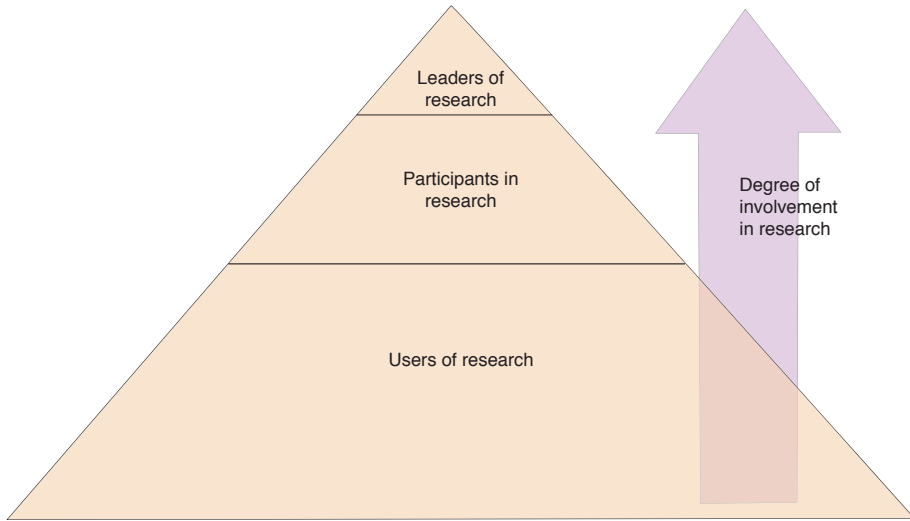
5.12 Conclusion

Research in general practice is stronger than ever. However, seen in relation to research from other disciplines, general practice remains underdeveloped. Australian authorities have recognised this, and invested substantially in a raft of activities to promote and support general practice research.

This is always going to be a 'bootstrapping' issue: increases in research activities in PHC are always going to be hampered by the current lack of infrastructure and expertise. Indeed, one of the key criteria for success in gaining funding for research from the NHMRC is previous success! There are problems with fundamental issues such as whether the Australian community (both the community at large and the medical community) recognises general practice (among the medical disciplines) as a proper place for intellectual inquiry at all (Del Mar et al. 2003). Medical research has become a highly competitive environment, and increasing funding for primary care research will be contested vigorously by other previously more successful specialties. One temptation for Australian primary care researchers is the greater opportunities abroad, in increased funding, a wider range of collaborators, and more fertile ground in which to conduct such research. There is currently a worldwide shortage of such researchers (*Lancet* 2003), and this is likely to mean a net loss of such expertise from Australia. In turn, this means that progress will be slow. It will be many years before investment in research activities can possibly be realised in improvement of the quality of care being delivered through informing either PHC workers or their policy makers.

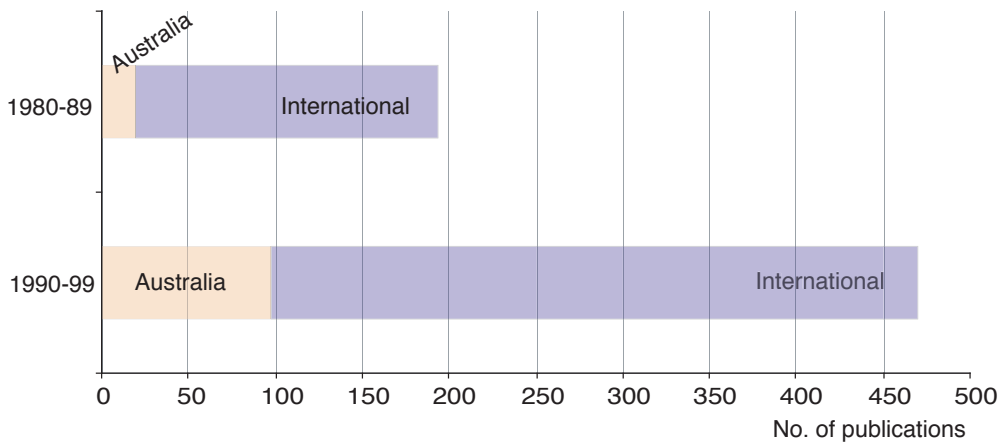
What remains to be seen is when, or even if, the academic general practice community will be able to respond to these initiatives, and the challenges for which the initiatives were designed. This will require an increase in the quality, dissemination and use of their research.

Figure 5.1 ‘Glasziou’s triangle’: different levels of research engagement



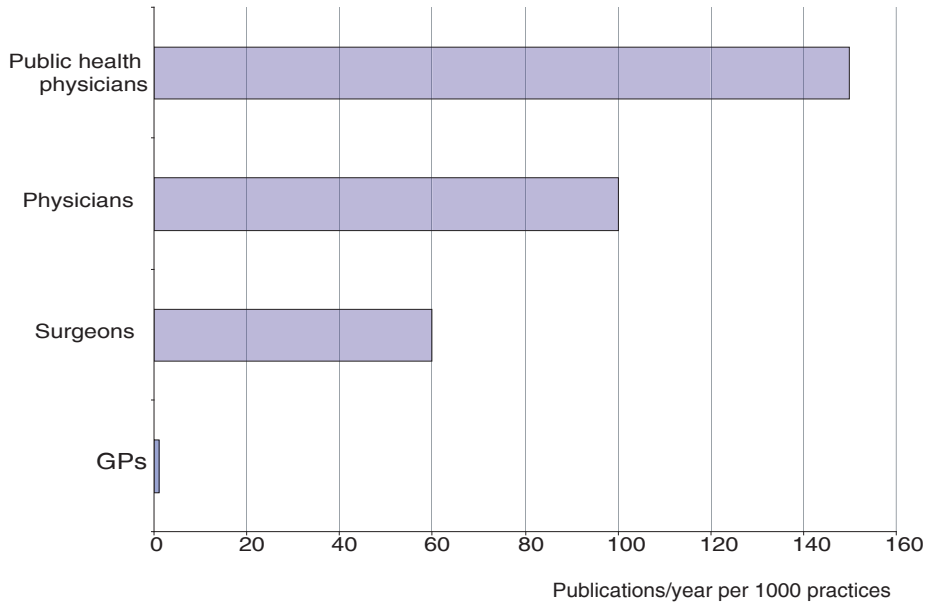
Source: Del Mar (2001)

Figure 5.2 Amount of research undertaken in general practice in Australia and place of publication



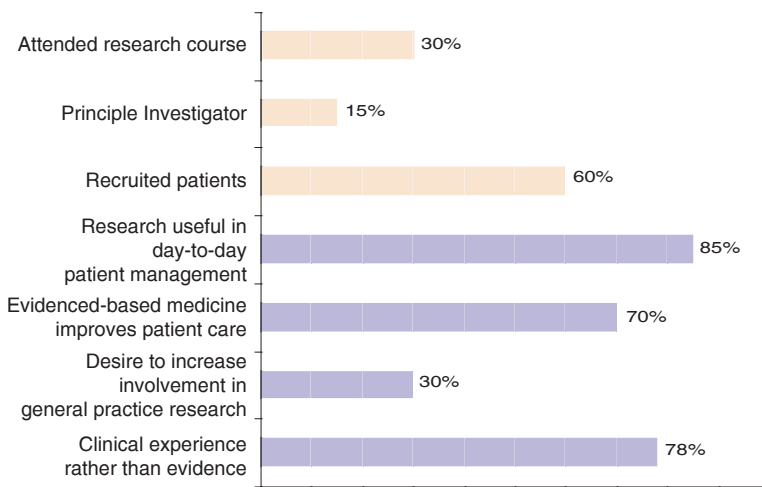
Source: Ward et al. (2000)

Figure 5.3 Publication rates for Australian general practice compared to other disciplines, 1990–1999



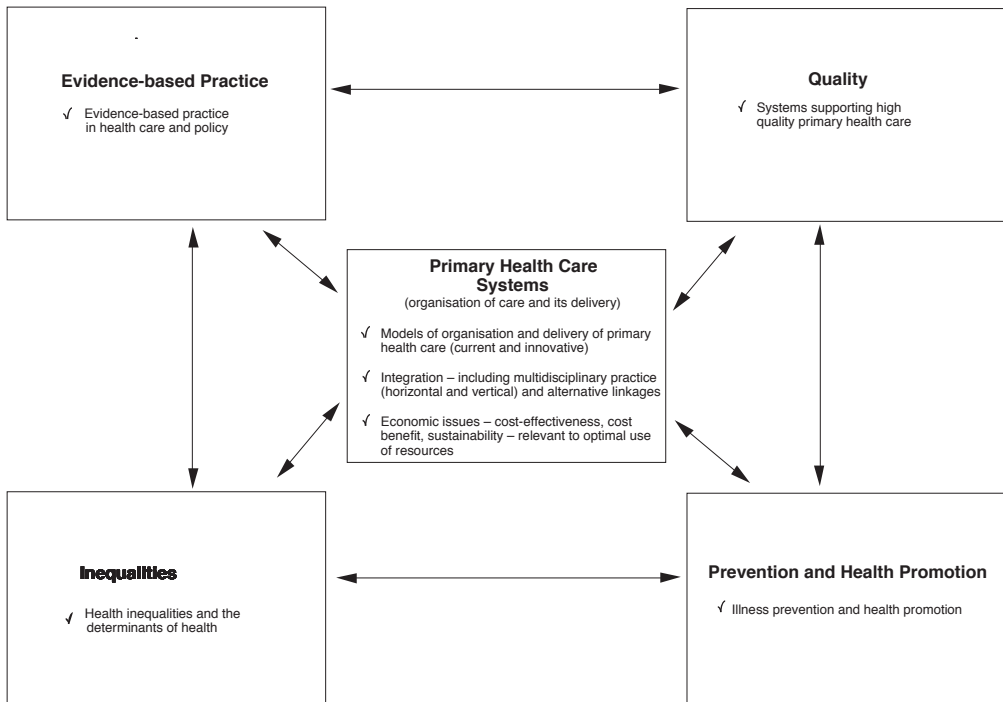
Source: Askew et al. (2001)

Figure 5.4 GP involvement in, and attitudes to research



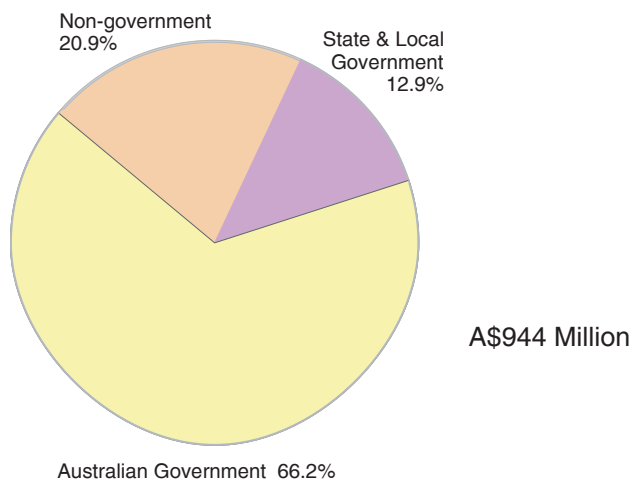
EBM = Evidence-based medicine
Source: Askew et al. 2002

Figure 5.5 Areas identified as priorities for research through the PHC RED priority setting process



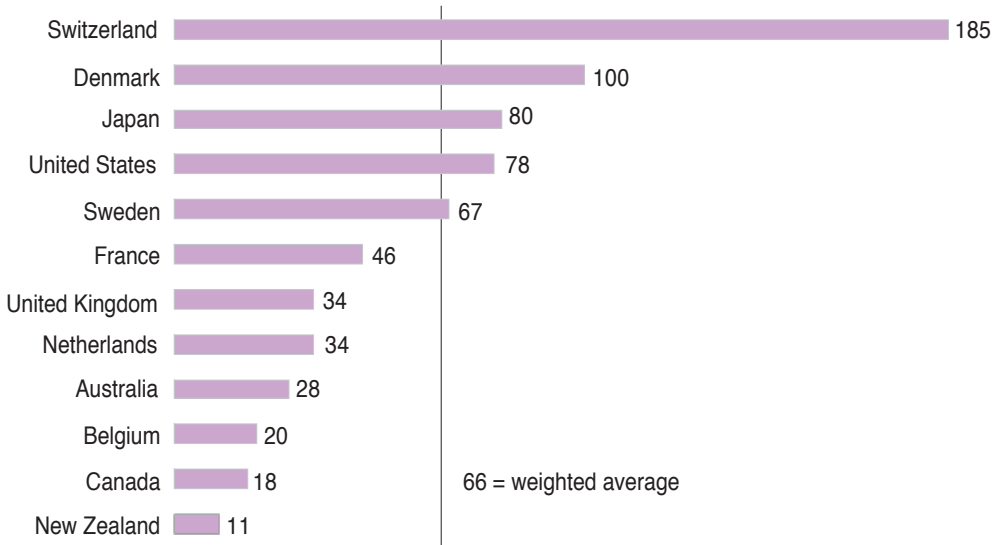
Source: PHCRIS (2002)

Figure 5.6 Recurrent expenditure on health research, by broad source of funds, as a percentage of total funding, 1999–2000



Source: AIHW (2002b)

Figure 5.7 Public expenditure on health and medical research and development (A\$ per capita), 1995



Source: adapted from the 'Wills' report (Richards 2000)

5.13 References

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5.14 Endnotes

¹More information available online at <http://www.npcrdc.man.ac.uk/About.cfm>

²More information available at <http://www.sspc.uk.com>

³Available online at http://www.chsrf.ca/programs/index_e.shtml

⁴Available online at <http://www.ahcpr.gov>

⁵Available online at <http://www.grants2.nih.gov/grants/guide/rfa-files/RFA-HS-02-003.html>

⁶A list of NAPCRG projects is available online at <http://www.napcrg.org/compendium2002.html>

⁷Information available online at <http://www.hrc.govt.nz>

⁸Information available online at http://www.researchschoolcare.nl/Inhoud/CaRe%20info_bestanden/Jaarverslag.pdf

⁹Information available online at <http://www.researchschoolcare.nl>

¹⁰Available online at <http://communities.msn.com/IFPCRN>

¹¹Available online at <http://www.acrrm.org.au>

¹²Available online at <http://www.sph.uq.edu.au/QCIDD/chap>

¹³Information available online at <http://www.aaagp.org/> (accessed 21 February 2003)

¹⁴More information available online at <http://www.racgp.org.au/folder.asp?id=232> (accessed 31 Mar 2003).

¹⁵More information available online at <http://www.racgp.org.au/document.asp?id=889> (accessed 31 Mar 2003).

¹⁶Available online at <http://www.health.gov.au/nhmrc/publications/pdf/r23.pdf>

¹⁷More information available online at <http://www.health.gov.au/hsdd/primcare/acoorcar/abtrials.htm>

- ¹⁸More information available online at <http://www.bndgp.com.au> (accessed 7 Dec 2003).
- ¹⁹More information available online at <http://www.health.gov.au/mediarel/yr2002/kp/kp02037.htm> (accessed 7 Dec 2003).
- ²⁰Available online at <http://www.health.gov.au/epc/pdf/eval0307.pdf>
- ²¹Available online at <http://www.ncci.org.au/projects/prostate/psa.htm>
- ²²More information available online at <http://www.ncci.org.au/projects/prostate/psa.htm>
- ²³Draft PHCRED University Initiative National Strategic Plan, 2001; see <http://www.health.gov.au/hsdd/gp/phcresch.htm>
- ²⁴More details can be found online at <http://www.anu.edu.au/aphcri>
- ²⁵Available online at <http://www.nhmrc.gov.au>
- ²⁶Details can be found online at http://www.phcris.org.au/resources/phcred/phcnhmrc_frameset.html
- ²⁷Detailed information about the projects funded through the NIFP is available online on the Australian Divisions of General Practice website: <http://innovations.adgp.com.au/site/index.cfm>
- ²⁸See <http://www.nicsl.com.au>
- ²⁹See <http://www.cochrane.org>
- ³⁰For more information online, see http://www.phcris.org/aboutus/about_us_frameset.html (accessed 7 Dec 2003).
- ³¹See <http://www.phcris.org>
- ³²See <http://www.sch.abs.gov.au>
- ³³Available online at <http://www.fmrc.org.au/beach>
- ³⁴See http://www.generalpractice.adelaideuni.org/research_index.htm (accessed 27 Nov 2003).
- ³⁵ More details of the Australian Women's Longitudinal study and publications can be found online at <http://www.newcastle.edu.au/centre/wha/project.html>

