mission is likely to reach beyond general practice — scientists are increasingly aware of the need for community-based longitudinal data to evaluate innovative developments such as advances in genetics.

Research networks can change the culture of biomedical science by shifting the focus of research from technology in the hospital to patients and their diseases in the community. Furthermore, networks can build general practice research capacity. The Dutch university-based research networks are a case in point, having made a substantial contribution to academic primary care research capacity and output, and the development of evidence-based general practice guidelines.[9]

General practice research networks can have substantial impacts on research, and their structure and financing require the attention of the scientific community. Ultimately, though, their future depends on the quality of their contribution to biomedical research.

Chris van Weel

Professor, Department of General Practice
University Medical Centre, Nijmegen, the Netherlands

1. Van de Lisdonk EH, van den Bosch WJHM, Huygen FJA, Lagro-Janssen ALM, editors. Ziekten in de huisartspraktijk. 3rd ed. Maarssen: Bunge/Elsevier, 1999.
2. van Weel C, Smith H, Beasley JW. Family practice research networks — experience from three countries. *J Fam Pract* 2000; 49: 938-943.
3. White KL, Williams TF, Greenberg BG. The ecology of medical care. *N Engl J Med* 1961; 265: 885-892.
4. de Grauw WJC, van Gerwen WHEM, van de Lisdonk EH, et al. Outcomes of audit-enhanced monitoring of patients with type 2 diabetes. *J Fam Pract* 2002; 51: 459-464.
5. International Federation of Primary Care Research Networks. <http://communities.msn.com/IFPCRN>. Accessed 3 June 2002.
6. Gunn J. Should Australia develop primary care research networks? *Med J Aust* 2002; 177: 63-66.
7. Mant D. Research and development in primary care. National Working Group Report. Wetherby: UK Department of Health, 1997.
8. Nutting PA, Beasley JW, Werner JJ. Asking and answering questions in practice: practice-based research networks build the science base of family practice. *JAMA* 1999; 281: 686-688.
9. Interfacultair Overleg Huisartsgeneeskunde. Rapportage Academisch Werkveld Huisartsgeneeskunde 1992–1997 [Interfaculty Council of General Practice. Report on the results of the academic practices network 1992–1997]. Nijmegen: Department of General practice, University of Nijmegen, 1998.
10. The Brisbane Initiative: International Advanced Education for Primary Care Research. International Primary Care Research Meeting, Brisbane, 15 March 2002.
11. van Weel C. Examination of context of medicine. *Lancet* 2001; 357: 733-734.
12. Makeham M, Dovey S, County M, Kidd M. The Primary Care International Study of Medical Errors: outcomes of the Australian experience. *Med J Aust* 2002; 177: 68-72.
13. Global Family Doctor — WONCA Online. Website of the World Organization of Family Doctors. <http://www.globalfamilydoctor.com>. Accessed 3 June 2002.❑

VIEWPOINT

Should Australia develop primary care research networks?

Jane M Gunn

ABSTRACT

- Primary care research networks have emerged in other countries over the past decade. Rigorous data to determine the level of their achievement are lacking.
- Research networks are a part of the current Australian primary healthcare research capacity building program, yet we have no systematic approach to their introduction.
- Australian networks should build upon international experience and should not duplicate the role of Divisions of General Practice.
- Each network should have clearly defined aims, strategies and key indicators against which to evaluate performance.

MJA 2002; 177: 63-66

For editorial comment, see page 62.

Department of General Practice, University of Melbourne, Melbourne, VIC.
Jane M Gunn, PhD, FRACGP, Senior Lecturer.
Reprints: Dr J M Gunn, Department of General Practice, University of Melbourne, 200 Berkeley Street, Carlton, VIC 3053.
j.gunn@unimelb.edu.au

THERE IS GENERAL AGREEMENT that primary care needs a strong research culture and evidence base if it is to deliver cost-effective healthcare.[1-6] Between 2001 and 2004, the Commonwealth Government will spend $50 million on a program of Primary Healthcare Research Evaluation and Development (PHCRED). One component of PHCRED funds university departments of general practice and rural health to " 'build capacity' in the area of primary health care research"[7] through research skill development, the development of research networks and actual research.

Research networks developed as a tool to increase the research capacity of primary care practitioners and to promote evidence-based practice.[1,6] But have these objectives been met? In this article, I review the major achievements and challenges of research networks overseas and discuss the role of research networks in Australia.

What are we building upon?

Australian academic general practice is only 25 years old.[8] There are 11 departments of general practice, yet the ratio of GPs in academic positions compared with specialist physicians[8] and the research output of general practice[9] remain low. The General Practice Evaluation Program

1: The Wessex Research Network (WReN), UK

- WReN was established in 1993 as a tripartite initiative between the Department of Primary Medical Care, University of Southampton, the Wessex Faculty of the Royal College of General Practitioners, and the research and development directorate of the former Wessex Regional Health Authority.
- The research network comprises 483 practices, of which 287 have a least one WReN member; about 75% of these are "research active" (attend a course, oversee a project, or are a part of a WReN project).
- WReN employs between 3.1 and 3.5 full-time-equivalent staff to oversee the network.
- Typical activities of WReN are database management, newsletter production, ⩾350 hours/year of individual consultation with GPs and other healthcare professionals, administration of a bursary scheme for practitioners to formulate research proposals, organisation of training days, support to network projects, and participation in collaborative research projects with other organisations.

2: The Nijmegen Family Practice Academic Network

- Established in 1971 and coordinated by the Department of Family Medicine, University of Nijmegen.
- Sponsored by the National Health Service and University Medical Centre, Nijmegen.
- All family physicians working in 10 practices (25 clinicians) meet on a monthly basis.
- The network members collect a standard set of patient-related data for all routine clinical encounters.
- Various large longitudinal studies have been conducted (eg, early-childhood morbidity, asthma, non-insulin-dependent diabetes mellitus) as well as intervention studies.
- Eight of the 25 physicians have obtained an MD or PhD qualification.

3: Examples of Australian general practice research networks

- The Australian Sentinel Practice Research Network (ASPREN; <http://www.health.gov.au/pubhlth/cdi/ozflu/flucurr.htm>) is a network of general practices that collect data on clinical presentations of "influenza-like illness". Between 35 and 70 practices take part in data collection each week.
- Health Communication Network (HCN; <http://www.australiandoctor.com.au/healthcomms.asp>) is an Australian based e-health company that markets the prescribing software package Medical Director. HCN has established a national network of Australian GPs who provide de-identified prescribing data to the HCN research division, and, in turn, the GPs receive data that allow them to compare their practice with their peers.
- The University Family Practice Network (UFPN) in South Australia[17] comprises five family practices (26 GPs) owned by or affiliated with the Department of General Practice, University of Adelaide, and the South Australian Centre for Rural and Remote Health. At each practice, one GP is funded for one day a week, providing dedicated time to undertake research, and awarded an academic title in the university. A full-time research fellow is funded to coordinate research within the network.

(1990) provided the first significant injection of funds into primary care research in Australia. In 1992, this was included in the General Practice Strategy, which had the aims of introducing blended payments and establishing Divisions of General Practice.[10] Divisions were designed to forge better links between GPs and other healthcare agencies and facilitate alternative practice and payment models.[10] Divisions have become stable organisational structures that function well as associations for GPs, yet many struggle to develop a clear role within the wider primary healthcare system.[11]

What can we learn from international experience?

Despite major differences in healthcare systems, the United Kingdom influences the reform of general practice in Australia: from the initial modelling of the Royal Australian College of General Practitioners (RACGP) on the Royal College of General Practitioners (RCGP)[10] to the impact of the Mant Report[6] on the current PHCRED program. Primary care research networks (PCRNs) are a key component of the research capacity building program in the UK; however, developing research networks is not an end in itself. The term "research network" describes various structures with varying goals and outputs.[5,12] The UK and the Netherlands have a strong culture of research networks and their experience can guide us.

UK Primary Care Research Networks

PCRNs emerged in 1991, at a time when there were no geographical groupings or associations of GPs, when the first Regional Research Fellowship of the RCGP facilitated development of a research group that became NoReN, the first UK PCRN.[13] Concurrently, local research networks were funded in Scotland by the Chief Scientist Office to increase the quality, quantity and usefulness of health services research.[14] Further networks emerged in an independent and opportunistic fashion. Many lacked specific, measurable objectives. There was no uniform reporting structure or concurrent evaluation.[12] In 1996–97, 23 PCRNs were active in the UK, most located within academic departments of general practice, and receiving funding of £0 to £400 000 a year.[12] There are now 40 members of the UK Federation of Primary Care Research Networks, all with formal links to an academic department (see Box 1 for an example).[15]

UK PCRNs aim to promote high-quality research by practitioners, high-quality collaborative projects, and research awareness among practitioners.[12] They have brought together healthcare professionals interested in primary care research and have assisted them to gain training and undertake research. Lack of baseline data makes it difficult to know whether these activities represent large or small gains, or to assess how much PCRNs have contributed to increasing the quality, quantity and usefulness of primary care research (the reason for their inception). It is timely that a national review is planned, along with a national framework for accredited research practices.[16]

The Dutch research networks

The Netherlands has a long history of research networks, with groups such as the Nijmegen Family Practice Academic Network (Box 2), the Netherlands Network of Academic Family Practices, and the Registration Network of Family Practices. These networks are more university-centred, top-down organisations than UK PCRNs, undertaking research headed by academic practitioners. It is argued that this is evidence that the Dutch experience represents the "full circle of changed research culture", as eight of the 25 physicians in the Nijmegen network have achieved an MD or PhD qualification. The Nijmegen network aims to compile long-term individual morbidity and outcome-of-care data to increase the evidence base of primary care, and to inform clinical research. Four practices collect comprehensive data and 10 practices collect data for specific conditions.[1]

Existing Australian research networks

The RACGP has a network of practices that undertake research projects in conjunction with State-based research units. These practices have been involved in large clinical trials supported by RACGP research staff. Currently, GP members of existing networks have primarily collected data for research undertaken through the primary care setting. This role is changing with the emergence of networks such as the University Family Practice Network (UFPN). In these networks, GPs are more involved in the development, conduct and interpretation of research, in addition to their data collection role (Box 3).[17]

Should Australia develop more research networks?

Published studies of research networks generally conclude that they are worthy of dedicated funding,[1,3,5] yet it has been difficult to obtain clear and tangible evidence of outputs that would not have been achieved without a formal network. Australia has the opportunity to learn from the experience of research networks in other countries, which have demonstrated several important points.

- ***Research networks should have explicit aims:*** International experience highlights the need to be explicit about what we expect a research network to achieve. A network set up to encourage evidence-based practice will have different structures, goals, activities and outputs from a network set up to foster individual GPs undertaking small-scale, practice-based research, or a network set up to undertake large-scale interventional or longitudinal studies.

  Australian research networks should state clearly how they contribute to building an evidence base in primary care and improving the health of the population, in addition to how they meet the needs of their members.

- ***Research networks bring interested people together:*** The UK networks, like Divisions of General Practice in Australia, brought together GPs who had been working in relative isolation. Today groups of UK practices are involved, to differing degrees, in research in primary care (eg, collaborative projects addressing a primary care priority) in addition to undertaking their own research, and facilitating secondary/tertiary care research through primary care (eg, large clinical trials that recruit patients from all clinical settings).

  Australian research networks should avoid duplication of effort by building on the capacity of Divisions, which have a functioning organisational structure and communication strategy, know the interests of their members, and have existing networks with other healthcare professionals and organisations. Interested Divisions could appoint research and development officers, who, in collaboration with an academic department, could recruit and support specially funded "research practices" in a similar way to the UK PCRN.

- ***Networks should have academic links:*** Network members need easy access to suitably qualified researchers. Formal links to an academic department of primary care will make this possible, yet such links should be mutually beneficial. Academic staff must remain active in research and publish in peer-reviewed journals. Supporting network members is time-consuming, and has placed pressure on many academic units in the UK.

  Australian networks and academic departments should be mindful of potential competing demands. Discussions of expectations of level of practical support, investigator status, authorship and fund allocation are essential. Clear statements of what each partner brings to and receives from the collaboration should be made.

- ***Networks should complement other research capacity building initiatives:*** Experience from other countries demonstrates the benefit of collaboration between research networks, academic institutions and research bodies. Australian research networks need to complement the work of academic departments and the current national capacity building program, which has an agreed set of national priorities, a well established Primary Health Care Research and Information Service <www.phcris.org.au> and research funding available via the National Health and Medical Research Council competitive grants process.

  Research networks will also need to complement the activities of the forthcoming Primary Health Care Research Institute, the Divisions and the RACGP. Getting effective collaboration between these players will be challenging, but needs to be a priority if we are to build the research receptiveness and capacity of primary care.

- ***Research networks should be realistic about what they can achieve:*** Australia has much less funding available than the UK network program. We must be strategic in our approach to network development, for instance by encouraging networks that aim to increase evidence-based practice. Setting up a network that tries to achieve progress in many areas is unlikely to succeed.

- ***It is worthwhile considering the optimal size of a research network:*** The Dutch experience shows that small groups of practices with skilled GP researchers can achieve considerable outputs, such as publications and higher degrees. The smaller Netherlands-style network, embedded within a Divi-

sion of General Practice and supported by an academic department of primary care, is an attractive option for the Australian setting.

Australia also needs a nationally coordinated research practice network that is equipped to undertake large-scale, practice-based research to answer questions of national importance in primary care. This could be stand-alone, linked to an organisation (such as the RACGP or NHMRC), or could draw upon the divisional networks suggested above.

- ***Evaluation and monitoring are essential:*** The lack of an evaluation strategy during the development of research networks in the UK has resulted in considerable debate about what the PCRNs have actually achieved.[16,18] Any network development in Australia should include, and be funded for, a concurrent evaluation that clearly defines the network's objectives, strategies and activities.

Key performance indicators that measure critical processes and outcomes should be agreed upon from the beginning. Indicators should include a mix of measures, such as the number of practitioners and practices actively contributing to research, the number of practices with robust data collection systems in place, the number of practitioners skilled in evidence-based medicine, the amount of grant income from peer-reviewed competitive funding rounds, the number of practitioners completing research training, and the number of reports published in peer-reviewed journals. The networks will need to implement change in response to the evaluation findings.

Conclusion

Australia needs a primary healthcare system with a thriving research culture and evidence base. Research networks could be an important tool for achieving this aim. Universities could take a nationally coordinated, systematic approach to implement network models, building upon international experience. During the next three years, we could develop networks of research practices with practitioners skilled in research methods, who, in time, would link up to form a National Research Network to undertake large-scale studies. Achieving this would result in a giant leap towards embedding a research culture in primary care.

Competing interests

Jane Gunn is coordinator of the Primary Health Care Research Evaluation and Development Program in the Department of General Practice, University of Melbourne.

Acknowledgements

This article was researched and early drafts written during my sabbatical in the UK. Thanks to my hosts Professor David Mant, Oxford University, and Professor David Weller, University of Edinburgh. Thanks also to Helen Smith, Lucy McCloughlan, Sally Wyke, Joe Kai, Hiliary Hearnshaw, Judy Shakespeare, Brian McKinstry, and Pit Rink for their helpful discussion during the writing of this article. Thanks to Lucy McCloughlan, Christine Campbell, Doris Young, Jane Sims, Philippa Thomson and Judy Taylor for commenting on drafts.

References

1. van Weel C, Smith H, Beasley J. Family practice research networks: experiences from 3 countries. *J Fam Pract* 2000; 49: 938-943.
2. Primary Care Research Networks: their role in the development of primary care R&D in Scotland. Scottish School of Primary Care, 2000. <http://www.sspc.uk.com/html/pcrn-f4.html>. Accessed 30 October 2001.
3. Thomas P, Griffiths F, Kai J, O'Dwyer A. Networks for research in primary health care. *BMJ* 2001; 322: 588-590.
4. Kalucy L, Beacham B, Raupach J, et al. Priorities for primary health care research, evaluation and development in Australia. Final Report. Priority setting process: stage one. Adelaide: Flinders Press, 2001. Available at <http://www.phcris.org/publications/ps_full.pdf>
5. Green L, Dovey S. Practice based primary care research networks. *BMJ* 2001; 322: 567-568.
6. Mant D. R&D in primary care. National Working Group Report. Wetherby, UK: Department of Health, 1997. (Report No. 97CC0138.) Available at <http://www.doh.gov.uk/research/swro/rd/publicat/rdpcare/rdpcare.htm>.
7. Commonwealth Department of Health and Ageing. Primary care research, evaluation and development [website]. <http://www.health.gov.au/hsdd/gp/phcresch.htm>. Accessed 11 June 2002.
8. Kamien M. Has Australian academic general practice really come of age? *Med J Aust* 2001; 175: 81-83.
9. Askew D, Glasziou P, Del Mar C. Research output of Australian general practice: a comparison with medicine, surgery and public health. *Med J Aust* 2001; 175: 77-80.
10. Department of Health and Aged Care. General Practice in Australia. Canberra: Commonwealth of Australia, 2000. Available at <http://www.health.gov.au/gpconnections/gpinoz.htm>.
11. Rogers W, Veale B. Strategic evaluation of Divisions of General Practice: report on the effects of the transition to outcomes based funding. Adelaide: Department of Evidence-based care and General Practice, 1999.
12. Evans D, Exworthy M, Peckham S, Robinson R. Primary care research networks — Report to the NHS Executive South and West Research and Development Directorate. Research Paper. Southampton: Institute for Health Policy Studies, University of Southampton, 1997.
13. Carter Y, Elwyn G, Hungin P, editors. General Practitioner Research at the Millennium. A perspective from the RCGP. London: Royal College of General Practitioners, 2001.
14. The Chief Scientist Reports…Health Services Research Networks. *Health Bull (Edinb)* 1991; 49: 347-348.
15. Report of the United Kingdom Federation of Primary Care Research Networks. Nottingham: UK Federation of Primary Care Networks, 2001.
16. Primary Care Topic Working Group. NHS R&D Strategic Review. London: Department of Health, 1999.
17. Laurence C, Beilby J, Marley J, et al. Establishing a practice based primary care research network. *Aust Fam Physician* 2001; 30: 508-512.
18. Department of Health. Primary care: delivering the future. London: The Stationery Office, 1996. (Cm 3512.)

(Received 23 Nov 2001, accepted 27 May 2002) ❑