

How generalisable are results of studies conducted in practice-based research networks? A cross-sectional study of general practitioner demographics in two New South Wales networks

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The research output of Australian general practice lags behind that of other disciplines.¹ Practice-based research networks (PBRNs) are a key enabler of research in general practice and primary care internationally.²⁻⁴ PBRNs have thus been proposed as a vital element in expanding Australia's primary care research capacity and output.^{5,6} PBRNs are a means of providing research infrastructure in the geographically dispersed environment of primary care. Definitions of PBRNs vary (as do structures and functions) but a key feature is a formal administrative structure that transcends individual studies.⁷

An extensive mix of regional and national research networks has been developed in the United Kingdom.⁸ Similarly, PBRNs have proven to be a cornerstone of primary care research in a number of countries, particularly the Netherlands,^{4,8} Canada^{4,9} and the United States.^{4,8,10}

In Australia to date, progress in PBRN development has been very modest. An audit in 2010 documented six geographically defined PBRNs.¹¹ These networks do not receive dedicated funding. Currently PBRNs are largely supported as one of the many activities undertaken by the local Primary Health Care Research, Evaluation and Development (PHCRED) programs¹² based in university departments of general practice and rural health.¹¹ This program and funding will cease at the end of 2011. If PBRNs are to be considered for dedicated funding, it is timely to review their relevance and, in particular, the generalisability of findings from current PBRNs to contemporary Australian practice.

A principal rationale for promoting research carried out in primary care is that, compared with research carried out in secondary/tertiary care, the primary care-derived data will be more generalisable to primary care settings.¹³ An early criticism of PBRNs was that research carried out within these networks may not be generalisable — as a volunteer sample, PBRN clinicians may be systematically different from other clinicians. The characteristics that motivate participation by research network members

ABSTRACT

Objective: To compare the demographics of general practitioners in two practice-based research networks (PBRNs) and to explore the generalisability of research findings from these PBRNs.

Design, setting and participants: Cross-sectional questionnaire-based study of two geographically-based PBRNs — Hunter New England Central Coast Network of Research General Practices (NRGP) and Primary Healthcare Research Network-General Practice (PHReNet-GP) — during August–September 2010. All 183 GP members of both PBRNs were invited to participate; of these, 140 (77%) participated.

Main outcome measures: GPs' demographics, use of languages other than English in consultations, and previous participation in research. Practices' use of practice nurses. Socioeconomic status and rurality or urbanicity of practice location.

Results: Compared with PHReNet-GP GPs, NRGPs were more likely to work in a practice employing a practice nurse (100% v 53.8%; 95% CI for difference, 30.5%–61.8%; $P < 0.001$), worked in larger practices (2.9 more full-time-equivalent GPs per practice; 95% CI, 2.1–3.6; $P < 0.001$), and were less likely to work in a major city (33.7% v 89.7%; 95% CI for difference, 42.8%–69.3%; $P < 0.001$). NRGPs also worked in practices with a different spectrum of socioeconomic disadvantage, and were less likely to have been involved in research as a researcher (35.4% v 76.9%; 95% CI for difference, 25.3%–57.8%; $P < 0.001$). Fewer NRGPs consulted in languages other than English (8.9% v 64.1%; 95% CI for difference, 39.1%–71.2%; $P < 0.001$). There were also differences between these and national general practice statistics.

Conclusions: These results suggest possible lack of generalisability of findings from some types of studies conducted in single PBRNs. In such circumstances, collaboration of PBRNs may produce more generalisable results.

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may make these individuals different from the average practitioner, possibly biasing results towards higher standards of care.¹³

Generalisability of study results conducted in primary care may be affected by the representativeness of the participating clinicians and/or of the practices' patients. Our study addressed the representativeness of GP members of two Australian PBRNs.

METHODS

This was a questionnaire-based cross-sectional study.

Setting

Our sample was a convenience sample of two New South Wales practice-based networks: the Network of Research General Practices (NRGP), which covers Central

Coast, Hunter and New England, and the Primary Healthcare Research Network-General Practice (PHReNet-GP), which encompasses South Western Sydney, Southern and South Eastern Sydney, and the Illawarra and Shoalhaven. NRGPs and PHReNet-GP are supported by the PHCRED programs of the University of Newcastle and University of New South Wales, respectively. NRGPs comprised 133 GPs from 16 practices and PHReNet-GP, 50 GPs from 47 practices. NRGPs membership is at the whole-practice level. In PHReNet-GP, membership is at the individual GP level.

Recruitment

In August 2010, GPs in both networks were invited to participate via information packs containing an information sheet and an anonymous questionnaire. PHReNet-GP

Demographics and characteristics of general practitioners and practices for two practice-based research networks in New South Wales, with formal assessment of group differences

	NRGP (n = 101)	PHReNet-GP (n = 39)	PHReNet-GP v NRG difference (95% CI)	P	NRGP and PHReNet-GP (n = 140)	National comparison
Mean age, years	49.0 (SD, 10.0)	48.1 (SD, 9.7)	-0.8 (-4.5 to 2.9)	0.67	48.7 (SD, 9.9)	46 ¹⁶
Male sex	58.0%	69.2%	11.2 (-6.2 to 28.7)	0.21	61.2%	62.8% ¹⁶
Mean GP experience, years	18.5 (SD, 11.4)	17.9 (SD, 9.2)	-0.7 (-4.8 to 3.5)	0.76	18.3 (SD, 10.9)	
Mean number of sessions per week for individual GPs	6.8 (SD, 2.9)	7.4 (SD, 3.1)	0.7 (-0.5 to 1.8)	0.24	6.9 (SD, 3.0)	
Mean practice size, no. of FTE GPs	6.1 (SD, 1.8)	3.2 (SD, 2.4)	-2.9 (-3.6 to -2.1)	<0.001	5.3 (SD, 2.4)	2.7 ¹⁷
Practice nurse employed in practice	100%	53.8%	-46.2 (-61.8 to -30.5)	<0.001	87.1%	79.0% ^{18*}
Mean FTE practice nurses per FTE GP	0.47 (SD, 0.2)	0.23 (SD, 0.3)	-0.23 (-0.33 to -0.14)	<0.001	0.4 (SD, 0.3)	
Consult in another language	8.9%	64.1%	55.2 (39.1 to 71.2)	<0.001	24.3%	23.9% ^{18*}
Fellowship of RACGP or ACRRM	64.0%	74.4%	10.4 (-6.3 to 27.0)	0.22	66.9%	60.9% ^{18*}
Graduated in Australia	70.3%	64.1%	-6.2 (-23.7 to 11.3)	0.49	68.6%	72.9% ¹⁹
Involved in research as a researcher	35.4%	76.9%	41.6 (25.3 to 57.8)	<0.001	47.1%	na
ASGC-RA classification of practice postcode				<0.001		
Major cities	33.7%	89.7%	56.1 (42.8 to 69.3)		49.3%	77.3% ¹⁶
Inner regional	57.4%	7.7%	-49.7 (-62.5 to 37.0)		43.6%	15.1% ¹⁶
Outer regional	8.9%	2.6%	-6.4 (-13.8 to 1.1)		7.1%	6.2% ¹⁶
Remote or very remote	0	0	0		0	1.3% ¹⁶
SEIFA quintile of practice postcode				<0.001		
1 (most disadvantaged)	18.8%	23.1%	4.3 (-11.0 to 19.5)		20.0%	11% ²⁰
2	24.8%	10.3%	-14.5 (-27.2 to -1.8)		20.7%	na
3	26.7%	10.3%	-16.5 (-29.3 to -3.6)		22.1%	na
4	22.8%	20.5%	-2.3 (-17.3 to 12.8)		22.1%	na
5 (least disadvantaged)	6.9%	35.9%	29.0 (13.1 to 44.8)		15.0%	24% ²⁰

NRGP = Network of Research General Practices (Newcastle, New England and Central Coast). PHReNet-GP = Primary Healthcare Research Network-General Practice (South Western Sydney, Southern and South Eastern Sydney and the Illawarra and Shoalhaven). FTE = full-time equivalent. RACGP = Royal Australian College of General Practitioners. ACRRM = Australian College of Rural and Remote Medicine. na = not available. ASGC-RA = Australian Standard Geographical Classification-Remoteness Area. SEIFA = Socio-Economic Index for Areas. * Study sample data rather than comprehensive national reference data. ◆

GPs were individually posted information packs. Packs were delivered to individual NRGPs by their respective practice managers. There was a single blanket repeat distribution 4 weeks later.

GPs returned completed questionnaires by reply-paid post or fax.

Study instrument

The questionnaire elicited demographic information for the GP and his or her practice. Country of qualification, years of GP experience, fellowship of the Royal Australian College of General Practitioners (RACGP) and Australian College of Rural and Remote Medicine (ACRRM), use of languages other than English in consultations, employment of practice nurses in the practice, and previous participation in research were also elicited. Practice postcode defined

the Australian Standard Geographical Classification-Remoteness Area (ASGC-RA) classification¹⁴ and Socio-Economic Indexes for Areas (SEIFA) for disadvantage¹⁵ of participants' place of practice. SEIFA was recoded into quintiles, with Category 1 being the most disadvantaged area.

Analysis

Univariate analyses of demographic factors were by independent *t* test, Mann-Whitney *U* test, χ^2 test or Fisher exact test as appropriate. Statistical significance was assumed at $P < 0.05$ (two-sided). Adjustment for multiple comparisons was not performed as each outcome variable was independent of the others. Analyses were performed using PASW Statistics, version 18.0.3 (SPSS Inc, Chicago, Ill, USA) and Minitab, version 16 (Minitab Inc, State College, Pa, USA).

Ethics approval

Our study received ethics approval from the human research ethics committees of the University of Newcastle and University of New South Wales.

RESULTS

Of 183 members of the two PBRNs, 140 GPs (77%) returned questionnaires. Of these, 101 were NRGPs (response rate, 76%) and 39 were PHReNet-GP members (response rate, 78%).

Comparisons of results for each of the practitioner and practice characteristics for the two networks are presented in the Box. NRGPs were significantly more likely to employ a practice nurse, were larger, and were more likely to be located outside a major city. NRGPs worked in

practices with a different spectrum of socioeconomic disadvantage, and were significantly less likely to have been involved in research. Furthermore, significantly fewer NRGP GPs consulted in languages other than English.

Combined results of the two PBRNs are presented in the Box, along with national-level figures for comparison, where available. Comparison of individual PBRN and/or combined NRGP-PHReNet demographics with national figures suggests potentially important differences, notably in practice size, consultations in non-English language, employment of practice nurses, and rurality or urbanicity of practice.

DISCUSSION

The response rates of the two networks were similar, despite NRGP membership being at the practice level, and PHReNet-GP at the individual clinician level.

Significant differences in practice size, rurality, socioeconomic status, employment of practice nurses and frequency of non-English language consultations raise the question of possible differences on these parameters between PBRN GPs and other Australian GPs. Consideration of national GP characteristic data seems to support this contention. This calls into question the generalisability to the wider Australian general practice environment of results from studies conducted in such networks.

A number of factors, however, mitigate this conclusion.

First, the extent to which these differences compromise the external validity of network studies depends on the research question.¹³ In studies in which patients, rather than GPs, are the unit of analysis, selection bias in the composition of networks (with respect to GP characteristics) may not be a major impediment to the generalisability of results.¹³ This is the case for some NRGP and PHReNet-GP studies. Further, many projects conducted in research networks are not dependent on a representative study sample. Both PBRNs have conducted qualitative studies²¹⁻²³ and pilot studies that did not require representative sampling.

Second, research projects may use PBRN members while sampling more widely if the PBRN cannot fully support the study recruitment itself.²⁴ This raises the possibility of individual networks collaborating with other geographically based networks if there is a fit of a particular project with the combination of networks. The obvious example is where sample size considerations

require expansion of the study sample frame.

Another scenario is where a combination of networks will provide a more generalisable sample when representativeness is desirable. As illustrated in the Box, for some parameters, a combination of GPs from the two PBRNs provides a demographic profile that more closely approximates the national profile. There may be an opportunity to “mix and match” potentially collaborating, geographically based PBRNs within Australia in order to find the appropriate settings for particular research projects.

GPs in our PBRNs are much more likely to have been involved in research than GPs in a previous Queensland study (47.1% v 14.4%).²⁵ This greater engagement may well represent effect rather than, or as well as, cause. Rationale for PBRNs includes bottom-up capacity building as well as top-down recruitment functions. In addition to providing a means of recruitment for researchers (top down), PBRNs provide an opportunity for practitioners to become involved in research and acquire research literacy and experience (bottom up).⁶

A further pragmatic consideration is that although PBRN GPs may not be comparable to the national GP population for some important attributes, such as size of practice and ASGC-RA classification, this is also likely to be the case for any sample of randomly recruited GPs. Response rates are often poor in this setting (unlike our response rate of 77%) and the responders may be systematically different from the reference population of GPs in ways that are similar to those of PBRN GPs. A German study found characteristics of network and non-network GPs recruited to a regional study to differ from national reference data, and to differ in similar ways.²⁶ This is in the context of a higher participation rate in the study by network as opposed to non-network GPs (66% v 23%). The interplay of response rate (optimal via PBRN recruitment) and theoretical generalisability (via random probability sampling) may produce similar representativeness of study samples, regardless of which recruitment strategy is pursued. In another Australian study, compared with ours, GPs' mean age more closely approximated (but sex distribution of GPs less closely approximated) national statistics.²⁷ Furthermore, PBRN-based recruitment is more efficient (recruitment is targeted via a smaller sample frame and efficient intra-PBRN communication). No matter what the recruitment strategy, “care-

ful analysis of participants based on publicly available data is therefore crucial for the assessment of generalizability”.²⁶

PBRN GPs in our study were 2.7 years older than GPs nationally and more likely to be women (38.8% v 37.2%). A German study found that, compared with national reference data, its participating PBRN GPs were 0.7 years younger and more likely to be men (76.4% v 66.5%).²⁶ A UK study also found PBRN GPs to be younger than national comparisons.²⁸ As in our study, this PBRN contained relatively few small practices. Similarly, another UK study found network practice size to be larger than that of other local practices.²⁹

PBRN-member participants in US studies, compared with non-PBRN participants, were older and, unlike our study's NRGP-members, more likely to be in urban practice.³⁰

Thus, despite differences in PBRN member and non-member demographics in several countries, there is no consistent pattern in these differences.

National-level coordination of PBRNs will facilitate collaboration of regionally based PBRNs. Maintenance of autonomy and geographic integrity of individual networks is still vital to continuing engagement of local practitioners and bottom-up capacity building, but central facilitation of collaborations is also required.

Further research should examine the composition of patient populations recruited to studies via PBRNs.

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COMPETING INTERESTS

None relevant to this article declared (ICMJE disclosure forms completed).

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