

Evidence databases, the Internet, and general practitioners: the New Zealand story

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Abstract

Aim. To determine self-reported access to and use of the Internet and the Cochrane Library by general practitioners (GPs) in New Zealand.

Methods. A national cross sectional postal and fax survey of randomly selected GPs.

Results. A total of 381 of 459 eligible GPs returned completed questionnaires (83%). The mean age of this sample was 45.7 years (SD 8.6) and average years in general practice was 15.7 years (SD 8.8 years). 74% (277) were male and 77% (289) in full-time practice. Internet access was present in 40% (95% CI 36-46%) of practices and 76% (72-81%) of GP's homes. The majority, 56% (51-61%), of GPs had used the Internet with regard to a patient. Younger GPs (<35 years old OR = 2.69, 95% CI 1.10-6.60) and male GPs

(OR 1.72, 95% CI 1.02-2.90) were significantly more likely to report use of the Internet with respect to patients. 42% (95% CI 37-47%) of GPs were aware of the Cochrane Library but only 15% (11-19%) had used it. Those in group practice were more likely to be aware of the Cochrane database (adjusted OR 1.85, CI 1.09-3.12).

Conclusions. Internet use is prevalent among GPs. Solo practitioners, older GPs and female GPs are least likely to avail themselves of this resource. Although half of GPs knew about Cochrane, a minority used it. Access and use of evidence databases can be improved in New Zealand. Strategies to assist those least likely already to use Cochrane may help our collective efforts towards evidence based practice.

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There is an increasing interest in the promotion of evidence databases as part of evidence based medicine in general and primary care in particular.^{1,2} Although lack of awareness or use of evidence databases does not preclude evidence based practice, inability to readily access research findings at the time of decision making is considered a major impediment to best practice.^{3,4} GPs have diverse needs for evidence to inform their practice.⁵ While the utility of traditional text books has been questioned, it is uncertain how many GPs are ready for electronic resources in their practices.⁶

One vision of the future is a tool in general practice which provides streamlined Internet access via electronic medical records without technological difficulty (eg with modern telephones).⁷ Accessible databases will be important tools in the future. The Cochrane Library is an electronic resource summarising medical evidence from randomised controlled trials which have been reviewed by groups of experts using exacting methodological protocols. The Library includes 716 systematic reviews (and 662 protocols for reviews underway) as well as the Database of Abstracts of Reviews of Effectiveness (DARE from York University). It is available through the Internet and on CD-ROM.⁸ Abstracts of Cochrane reviews are available free of charge on the Internet. The current version of the Library includes reviews of relevance to GPs such as the effectiveness of antibiotics for acute bronchitis, acute sinusitis, the common cold, endometritis after delivery and, effectiveness of bladder training for urinary incontinence in adults.

In 1995, only 4% of a random sample of New Zealand GPs reported using their computers for information needs.⁹ A recent survey of GPs in New South Wales, Australia, revealed minimal awareness and use of the Cochrane Library or access to the Internet.¹⁰ Use of Cochrane was so low that predictors of use could not be determined.

The aim of the present survey was to determine New Zealand GPs' access to, and use of, the Cochrane Library and access to the Internet at home and at work. A secondary aim was to compare New Zealand results with other studies about information technology use in general practice.

Methods

499 GPs selected randomly from Medimedia, a commercial GP database company, were mailed or faxed a questionnaire about use of evidence databases. Non-respondents were sent two reminders, then telephoned to maximise response rate. The survey was carried out from November 1999 to February 2000. Part of the questionnaire was derived from an Australian survey of evidence databases.¹⁰ Respondents answered 'yes', 'no' or 'unsure' to the following questions:

- Are you aware of the Cochrane Library?
- Do you have access to the Cochrane Library?
- Have you ever used the Cochrane Library?
- Do you have access to the Internet in your practice?
- Do you have access to the Internet at home?
- Have you ever used the Internet in regard to a patient?

Respondents also completed standard demographic questions about their professional and practice characteristics.

The Auckland University Ethics Committee approved this survey.

Data analysis. Proportions and 95% confidence intervals were calculated for responses to questions using SPSS (version 10.05) and CIA (1.1 1991). The survey results were compared with other available published data about GP's access to the Internet and knowledge of the Cochrane library using the Chi Squared (χ^2) statistic. Univariate associations between use of the Internet in regard to patients and awareness of the Cochrane Library and personal and professional characteristics of respondents was examined using χ^2 test. Logistic regression modelling was then used to identify independent significant predictors of positive responses to these questions using SPSS.

Results

Of the original 499 GPs, 40 were ineligible because they were not at the stated address (22), retired (3) or not in general practice (15). Of the remaining 459, 381 returned completed surveys (83% response rate).

Of the 379 doctors completing the GP information section of the survey, 277 (74%) were male, 289 (77%) were in full-time practice and 280 (75%) were members of an Independent Practitioners Association (IPA). Solo practitioners numbered 93 (25%), 272 (72%) were in urban practice and the average number of patients seen per week was 117 (standard deviation (sd) 48.6). The mean age was 45.7 years (sd 8.6) and they reported being in general practice on average 15.7 years (sd 8.8). Significantly more male than female doctors were in solo practice (29% vs 12%

$p = 0.0001$) and more were in full-time rather than part-time practice (88% vs 40% $p = 0.0001$). Comparing to a RNZCGP sample drawn from 1995-98, the current sample drawn in 1999-2000, had more solo GP's (25% vs 20%), and less female GP's (26% vs 40% in the college sample).¹¹

While 56% ($n = 212$) of GPs reported ever using the Internet in regard to a patient, only 40% ($n = 151$) reported access to the Internet at their practice. The majority, 76% ($n = 287$), however, had Internet access in their homes (Table 1). GPs who had Internet access at the practice were more likely to have used it in regard to a patient (105 of 151, 68%) compared with those who did not have access at the practice (104 of 222, 49%, $\chi^2 18.1$ df 2, $p < 0.0001$). Of the 287 with the Internet at home, 122 (43%) also had access at the practice. GPs who did not have access at home ($n = 89$) were less likely to have access at the practice (29/89, $p = 0.028$) than those who did.

Table 1. General practitioner use of the Internet and awareness of the Cochrane Library ($n = 381$).

Internet	n	Yes % (95% CI)	No n (%)	Unsure n (%)
Access at the practice?	155	40 (36,46)	220 (59)	2 (1)
Access at home?	285	76 (72, 81)	88 (24)	
Ever used the Internet in regard to a patient?	210	56 (51, 61)	164 (44)	
Cochrane Library				
Aware of Cochrane Library?	156	42 (37, 47)	203 (55)	11 (3)
Have access to Cochrane Library?	58	16 (12, 20)	203 (55)	107 (29)
Ever used the Cochrane Library?	56	15 (11, 19)	309 (82)	5 (1)

Rural and urban practices had similar access to the Internet and knowledge of the Cochrane database (Table 2). When GP and practice related variables were controlled for, male GPs were significantly more likely to use the Internet with regard to a patient (adjusted OR 1.75, CI 1.02-2.90). Younger age also independently predicted self-reported use of the Internet with respect to a patient (Tables 3,4).

Table 2. General practitioner use of the Internet and awareness of the Cochrane Library by practice location ($n = 381$).

Internet		n	Urban n (%)	Rural n (%)
Access at the practice?	Yes	151	111 (41%)	40 (39%)
Access at home?	Yes	285	210 (77%)	74 (73%)
Cochrane Library				
Aware of Cochrane Library?	Yes	156	107 (40%)	48 (47%)
Ever used the Cochrane Library?	Yes	56	41 (15%)	14 (14%)
Total			270	102

Non-significant differences using Chi-squared test.

42% of GPs were aware of the Cochrane Library ($n = 156$). However, only 15% ($n = 58$) had ever used it. Univariate analysis (Table 3) showed that only group practice was related to increased likelihood of knowledge of the Cochrane Library compared with solo practice. Controlling for other variables, those in solo practice were less likely to have knowledge of the Cochrane Library compared with those in group practice (Table 4). There were no independent variables which predicted use of the Cochrane Library although, as elsewhere,¹⁰ low numbers using the database compromised statistical power for this analysis.

Compared with findings of a survey conducted in 1997 which asked identical questions of randomly selected GPs

from NSW, Australia, we found that significantly more New Zealand GPs were aware of the Cochrane Library ($\chi^2 27.18$ df 1, $p < 0.0001$), had used the Cochrane Library ($\chi^2 20.4$ df 1 $p < 0.0001$) and had access to the Internet at the practice ($\chi^2 61.7$ df 1 $p = < 0.0001$).¹⁰ In addition, more New Zealand GPs were aware of the Library compared with a sample surveyed in the UK in 1997 (15% vs 5%) ($\chi^2 5.54$ df 1 $p = < 0.019$).¹² Respondents in our survey also were more likely to have access to the Internet at home compared with responses of GPs in Otago and Southland when surveyed in 1998 ($\chi^2 25.69$ df 1 $p = < 0.0001$). Similar proportions had access to the Internet at the practice.¹³

Table 3. Univariate associations between reported evidence based medicine aspects and GP characteristic.

Ever used the internet in regard to a patient?				
Predictor	n	Number used internet in regard to patient	OR	95% CI
Age				
<35 years	38	27 (71%)		
36-45 years	138	83 (60%)		
46-54 years	130	69 (53%)		
>55 years	64	32 (50%)		
Per 10 yrs of age older			0.78	0.60-0.99
Other variables not associated: gender, solo practice, rural practice, part-time practice, years in general practice, patients seen per week.				
Knowledge of Cochrane Library?				
Predictor	n	Number with knowledge of Cochrane	OR	95% CI
Solo practice	92	31 (33%)	1	
Group practice	280	125 (45%)	1.78	1.05-3.02
Other variables not associated: age, gender, rural practice, part-time practice, years in general practice, patients seen per week				

OR = odds ratio; CI = confidence interval.

Table 4. Independent predictors of GPs knowledge of the Cochrane Library and use of the Internet for patient care (controlled for GP and practice characteristics).

Use of the internet in regard to a patient Controlled for solo practice, urban practice, patients seen per week				
Predictor	n	Number using internet in regard to patient	OR	95% CI
Age				
<35 years	38	27 (71%)	2.69	1.10-6.60
36-45 years	138	83 (60%)	1.45	0.78-2.71
46-54 years	130	69 (53%)	1.18	0.64-2.17
>55 years	64	32 (50%)	1	
Gender, Male	277	162 (58%)	1.72	1.02-2.90
Female	99	50 (50%)	1	
Knowledge of Cochrane Library Controlled for age, gender of the GP, number of patients seen per week, urban practice				
Predictor	n	Number with knowledge of Cochrane	OR	95% CI
Solo practice	92	30 (33%)	1	
Group practice	281	126 (45%)	1.85	1.09-3.12

OR = odds ratio; CI = confidence interval.

Discussion

If our results are representative, it appears more than half (56%) of New Zealand GPs ever have used the Internet in regard to patient care. Most New Zealand GPs currently have access to the Internet at home. 40% of GPs have access to the Internet in their practices and, even of those without, almost half had used the Internet for patient care (46%). The value of information accessed from the Internet can be variable, but we infer that Internet use is becoming acceptable to GPs.

Age and gender were independent predictors of using the Internet in regard to a patient whereas practice size, location

and membership of an IPA were not related. Individual GP characteristics appear more influential than practice setting, including location, in predicting use of the Internet. By contrast, solo practice (as a practice characteristic) was the only independent predictor of knowledge of a highly regarded database on the Internet, the Cochrane Library. These associations also were found in a study of Australian GPs,¹⁰ suggesting age and gender are barriers to technology use and isolation may be a barrier to evidence-based approaches to clinical care once availed of technology. Female doctors, older doctors and female patients in Norway are less likely to have or use the Internet.^{14,15} Female doctors also are more likely to be in part time practice, which may reduce their input into decisions about computer hardware and software (a conclusion also found in an unpublished study: personal communication, T Kenealy). In aiming to increase the awareness of technology based evidence, considering gender, isolation and age in developing educational strategies for GPs may facilitate greatest impact.

The Cochrane Library reports evidence based systematic reviews conducted with greater rigor and more frequent updating than those in paper-based journals.¹⁶ While this source of evidence was known to 42% of New Zealand GPs, only 15% had ever used it. As almost all of those who had access to the Cochrane Library in this survey had used it, access to the Library may be a redressable issue. If the Cochrane Library is to be useful to promote evidence based practice, greater efforts to increase awareness of and access to the Library need to be made. Other evidence based resources available online include Clinical Evidence at <http://www.clinicalevidence.org> and Bandolier at <http://www.jr2.ox.ac.uk/bandolier>.

While we are optimistic that many more New Zealand GPs in 1999 are aware of and use the Cochrane Library than Australian GPs in 1997,¹⁰ the two year period between the two surveys may explain some of this difference. Computerisation would have increased in that time period due to incentive programs in both countries. In 1997, only 5% of Canadian physicians¹⁷ and 4% of UK GPs¹² used the Cochrane Collaboration reviews. While it appears New Zealand GPs have increased their awareness and use of this evidence database, only 40% of GPs in our survey and another conducted in New Zealand one year previously¹³ have access to Internet within the practice. GPs, in this aspect, appear to lag behind neonatologists and obstetricians in the use of evidence databases.^{18,19}

Access to and reading of evidence is only the first step to evidence based practice however. The challenge is application of this information to practice.³ We restate that there is a long road ahead until all GPs have access to, are using evidence based data and integrating this into practice.¹⁰

Research evidence is lacking about personal and contextual dimensions of clinical decision making which is relevant to GPs.²⁰ New strategies may be required to generate relevant evidence useful in the general practice setting.²¹ While the process of applying research evidence to practice has been described,⁴ accessibility, usefulness and uptake of evidence based clinical practice guidelines have to be improved before changes in practice are likely.²² Local consensus building and

other strategies have been important in evidence based prescribing.²³ The first step is, however, to improve accessibility of information.

The major methodological strengths of this survey derive from a national sampling strategy and a high response rate. While nothing was ascertained of the views of non-respondents, the views of 83% are likely to represent the views of the whole. Comparison to a RNZCGP sample drawn over the years 1995-8 suggests the current sample has less female GP's and more solo GP's.¹¹ This may reflect differences between College and non-College members since not all GP's are associated with the RNZCGP. Efforts to maximise response were successful in this instance. A survey of larger numbers may have permitted further analysis to better understand the uptake of this form of evidence based information. Other influences on use of evidence databases, such as attitudes and knowledge about evidence based practice and public health principles were beyond the scope of this study but may also be important. Variation in attitudes to evidenced based care have been described but have not yet been shown to be associated with use of evidence based sources of information.^{12,24} This is a topic for further research.

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