



# Perspectives of New Zealand patients and GPs at the beginning of patient portal implementation

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## ABSTRACT

**INTRODUCTION:** New Zealand health policy encourages patient access to their electronic medical records via portals.

**AIM:** To discover patient and general practitioner (GP) perspectives of access to electronic medical records and e-messaging in the early portal implementation phase.

**METHODS:** In 2014, Auckland primary health organisations and an Accident & Medical organisation were asked to invite their GPs to complete an online survey and consent for a researcher to attend their waiting room and invite patients to complete a survey.

**RESULTS:** In total, 421 patients (13% Māori, 18% Pacific, 7% Asian, 53% NZ European/Other) participated from 13 general practices. Most (77%) knew they were entitled to see their medical records and 90% were interested in viewing them. Over two-thirds thought that viewing their records online and e-messaging their practice was a good idea. Over 80% disagreed that they would be worried, confused or embarrassed by seeing their records, with 59% expecting portals to facilitate understanding of their medical conditions. Internet security and privacy concerned 40% of patients. Among 83 GPs who completed the survey, six (7%) had already implemented portals. Few were comfortable to open up the whole health record, especially visit notes. While GPs thought that portal access may help patients better understand their plan of care, their main concerns related to causing confusion and worry. Portal implementation was expected to change GP documentation and increase practice workload and costs without demonstrable benefit to practices.

**DISCUSSION:** At the beginning of portal adoption, patients were interested. GPs were more reticent, unsure whether the benefits would outweigh the downsides for their patients and practice workload.

**KEYWORDS:** patient portals; personal health records

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## Introduction

The way people communicate and share information in the 21<sup>st</sup> century relies heavily on electronic formats such as social media, email, websites and other platforms on the Internet, especially in developed countries.<sup>1</sup> Conspicuously missing is

peoples' access to their own medical records. The New Zealand Privacy Act<sup>2</sup> states that people have the right to access their medical records and correct errors, and in the past, this has occurred on patients' specific requests. Usually, patients go to their health provider and view records together.

## WHAT GAP THIS FILLS

**What is already known:** Patient portals have been encouraged to increase patient engagement by facilitating learning about health issues, improving communication and access to their healthcare team, and supporting self-management of long-term health conditions. In 2013, the New Zealand National Health Information Technology Plan included a target that 90% of the population enrolled in a primary health organisation should have a patient portal available by the end of 2014. By May 2014, ~7% of New Zealand general practices had implemented a patient portal. At this time, little was known about patient and GP perspectives of patient portal access to electronic medical records.

**What this study adds:** This study surveyed patient and general practitioner (GP) views in the early stages of portal implementation. Most patients saw benefits; they trusted their practice team and did not see any need to use portals to 'check up' on their doctors, but indicated that portals might help their understanding of their health and medical conditions. Most disagreed that they would be worried, confused or embarrassed. Although GPs could see some advantages, such as patients being able to better remember their plan of care, the overall benefits were unclear given the perceived major change in practice processes and communication that portals represented.

Patient portals are secure online sites provided by general practices where patients can access their health information at any time they wish. Portals also include web-based functions so that patients can interact with their general practice.<sup>3</sup> In 2010, the National Health Information Technology Plan included a target that by the end of 2014, 90% of people enrolled in a primary health organisation (PHO) should have a patient portal available and that 10% should have accessed their health information or practice through this avenue.<sup>4</sup> The target was ambitious, but technically possible due to general practice computerisation, secure Internet functionality and portal software availability that could be implemented in conjunction with patient management systems used by the most general practices in New Zealand.<sup>5</sup> Features of portals included: access to medications, diagnoses, immunisations and visit notes; the ability to order repeat prescriptions and interact with doctors and practice nurses via secure messaging; release of diagnostic test results to patients; and access to documents such as specialists' letters. Portals may therefore be useful for both patients and practice staff. However, while there are

anticipated benefits, this tool represented a 'sea-change' in New Zealand general practice.

There are set-up and on-going costs with implementation, as well as the initial burden of work involved for patient registration. As clinicians are responsible for maintaining medico-legal records about patient care, there are some concerns about the effects of patients accessing their records online.

There is evidence that the quality and safety of health services can improve when patients become engaged in their own care.<sup>6,7</sup> Portals may facilitate collaboration between patients and clinicians, help with understanding health issues and support self-management of long-term health conditions.<sup>8-10</sup> Follow up of referrals and test results could also become easier and more effective. In contrast, clinicians have been worried that access to medical notes or laboratory results may leave patients feeling confused, anxious or embarrassed by what they read,<sup>10,11</sup> and clinicians are concerned about protecting vulnerable patients (e.g. patients who may be coerced into sharing their online record).<sup>6</sup>

In May 2014, ~7% of New Zealand general practices had implemented a patient portal. Rogers' theory of innovation diffusion<sup>12</sup> describes stages of innovation adoption, and we found ourselves aligned with early adopters in 2014. The aim of our research was to discover the attitudes and expectations of patients and GPs about portals in the early adoption phase.

## Methods

The survey tool used in this study was adapted with permission from the developers of the questionnaire used in the OpenNotes project conducted in the United States (US).<sup>13-15</sup> This questionnaire focused on patients' and primary care doctors' attitudes to patients accessing the clinical *visit notes* made at the time of consultation. Unlike this study, in the three US settings investigated, all patients at the start of the study had portal access to their health records (except the visit notes) and could interact electronically with their care team for messaging, requesting a prescription and booking an appointment. To adapt this questionnaire to a GP and patient population entirely naïve to patient portals, we also identified other international

surveys.<sup>16–18</sup> Questions were broadened to include access to parts or the whole of the electronic health record (EHR), as well as eliciting perspectives about online communication (secure messaging) to and from the practice team.

The survey had five sections for patients and four sections for GPs, as shown in Box 1. To be comparable, the wording for both clinician and patient surveys remained as similar as possible using ‘*Your patients*’ (for GPs) and ‘*I*’ or ‘*You*’ (for patients). Two GPs and two volunteer consumers pretested the questionnaire and changes were made following their feedback. The survey was anonymous and could be completed electronically or on paper.

### Recruiting participants

In 2014, the study team approached all PHOs in the Auckland region, asking them to invite their members to participate in the study. Four PHOs serving ~1.25 million enrolled patients<sup>19</sup> (~80% of the Auckland regional population) responded and invited their member GPs to participate via practice emails, PHO newsletters and practice facilitators. GPs could respond to the GP survey and, if they wished, agree to a research assistant spending at least a morning or afternoon in their waiting room to administer the patient survey (via tablet or printed questionnaire, depending on participants’ preferences). All patients aged ≥18 years and in a waiting room before an appointment were eligible. The research assistant approached them after patients had checked in with receptionists. As we wished to canvas a wide variety of patients seeking medical care in the community, we also extended an invitation to an organisation providing Accident and Medical (A&M) services for our research assistant to come to their clinic’s waiting room for at least one session. Thirteen clinics (11 general practices, one student health service and one A&M clinic) located in north, west, east, central and south Auckland regions, agreed to allow a research assistant to sit in their waiting rooms. A research assistant spent a median of three sessions, each lasting 3–4 h (range one to six sessions), in each clinic.

### Analytic approach

Data collected from GP and patient surveys were entered onto Excel spreadsheets (Microsoft

**Box 1.** Survey sections for patients and GPs

Patient survey sections	GP survey sections
What you think about the idea of reading your medical records	What you think about the idea of patients viewing their medical records
How reading your medical records might affect you	How reading your medical records might affect your patients
Communicating with your doctor or general practice by secure messaging	
How emailing your doctor or general practice might affect you	Impact of portals on you and your practice
About you	About you

Corporation, Redmond, WA, USA) and imported into SAS statistical software 9.4 (SAS Institute Inc., Cary, NC, USA). Survey data were analysed using descriptive statistics. A content analysis<sup>20</sup> of the qualitative data from the open questions was conducted by SW and KD independently and then discussed to confirm key results.

This study was approved by The University of Auckland Human Participants Ethics Committee, reference 2013/9417.

### Results

A total of 421 patients participated in the survey. Table 1 shows their responses to sociodemographic, health and Internet questions. Most (73%) were aged <55 years, 61% were women and 46% were employed or self-employed. By self-identified ethnicity, 13% were Māori, 18% Pacific, 7% Asian and 53% were NZ European/Other. Self-rated health was fair or poor for 23% and 30% had visited their doctor more than four times in the past year. Despite being relatively young, 12% reported having diabetes and 6% a history of heart attack or stroke. Almost all (96%) patients indicated that they used the Internet; 84% at least weekly.

Eighty-three GPs participated in the survey. Table 2 shows their responses to sociodemographic and Internet questions. Most GPs were of NZ European ethnicity, aged 50–59 years, with 87% using the Internet at least weekly. Six GPs (7%) had already implemented portal software in their practices. Just under half of respondents (40/83) routinely

Table 1. Patient sociodemographic, health and Internet characteristics

Patients	Total (N = 421) n (%)
Gender (n = 387)	
Women	256 (61)
Men	131 (31)
Age group (years; n = 387)	
18–34	125 (30)
35–54	181 (43)
55–74	73 (17)
75+	8 (2)
Ethnicity (n = 385)	
New Zealand European/Other	222 (53)
Māori	56 (13)
Pacific	74 (18)
Asian	33 (7)
Employment status (n = 387)	
Employed or self employed	192 (46)
Unemployed or on sickness benefit	68 (16)
Homemaker	36 (9)
Retired	26 (6)
Student	12 (3)
Prefer not to answer	53 (12)
Overall health rating (n = 387)	
Excellent or very good	151 (36)
Good	138 (33)
Fair	83 (20)
Poor	15 (3)
Frequency see doctor (times per year; n = 387)	
≤1	102 (24)
2–3	158 (38)
4–5	83 (20)
≥6	44 (10)
Long-term condition (n = 387)	
Told by doctor that has diabetes	48 (12)
Told by doctor that has had a heart attack or stroke	24 (6)
Internet use (n = 388)	
Daily or almost every day	297 (71)
At least weekly	55 (13)
Fortnightly or less	17 (4)
Not at all	19 (4)

received emails from patients, 45% managed prescription requests online and one-quarter managed appointment bookings online.

Patient and GP responses to survey questions are summarised in Table 3. While 77% of patients thought they had the right to see and read their medical record, only 29% had asked to do so in the past. In contrast, 92% of GPs agreed that patients had a right to see their medical records and 81% have had patients requesting to view their records.

Overall, patients were more enthusiastic than doctors about portal access. Nearly all patients (90%) indicated their interest in seeing their own medical records, but only 68% favoured viewing them via the Internet or e-messaging their doctor (67%). For patients indicating 'yes' or 'don't know' to viewing their medical records using the Internet (355/421), the survey asked what parts they would like to see. Viewing blood tests or other laboratory results was most preferred (76%), although 70% indicated their interest in seeing their medical problems, medications, allergies, X-ray results and other reports. Seeing their consultation or visit notes (64%) and all aspects of their health record (59%) were also common preferences. Sharing their records with others, especially with a family member, friend or another doctor, was likely for 39% of respondents.

Of the 83 GPs, 65% agreed that it was good for patients to view their own health information and just over half agreed it was a good idea to make medical notes available to patients through secure websites or secure messaging. If portals were implemented, many GPs would be comfortable for their patients to see their medications (60%), allergies (60%), immunisations (61%) and perhaps laboratory results (51%); only 16 of 83 (19%) were comfortable with patients seeing the consultation notes, but one-quarter (21/83) would open all aspects of their health record to patients.

### Patient and GP expectations about benefits and harms

Figure 1 shows patients' responses to questions asking how reading their medical records online might affect them. Over half of the respondents (59%) agreed or somewhat agreed that reading their medical records might help them to understand

their health condition more. However, they did not necessarily agree that reading their notes would help them take better care of themselves (46%), take their medications better (34%), feel more in control of their health care (47%), be better prepared for visits (42%) or more satisfied with their medical care (48%). Most (82%) disagreed that online access would make them trust their doctor more. Furthermore, most disagreed that they would be more worried (83%), confused (85%) or embarrassed by the records (78%).

GPs' responses to similarly posed questions revealed more concerns that their patients might worry more (59%) and find test results (laboratory and radiology) confusing (64%), with only two perceived benefits; that reading their medical records might help patients remember their plan of care (64%) and feel more in control (53%).

GPs were also asked about the potential impact portals might have on themselves or their practice (Figure 2). The major concerns expressed regarding portal implementation related to an expected substantial increase in workload (69%) and having to deal with more questions outside of patient consultations (73%). Many (58%) anticipated that they would document things differently and that their patients would request changes in the medical records (57%). Less than one-third of GPs agreed that portals might improve patient satisfaction or facilitate more efficient or safer patient care.

Table 2. GP sociodemographic and Internet characteristics

General practitioners	Total (N = 83) n (%)
Gender (n = 73)	
Women	39 (47)
Men	34 (41)
Age group (years; n = 73)	
<40	5 (6)
40–49	16 (19)
50–59	39 (47)
≥60	13 (16)
Ethnicity (n = 71)	
New Zealand European/Other	57 (69)
Māori	1 (1)
Pacific	1 (1)
Asian	12 (14)
Internet use (n = 74)	
Daily or almost every day	67 (81)
Weekly or two or more times a week	5 (6)
Fortnightly or less	2 (2)
Already implemented portal software in the practice (n = 78)	6 (7)
In terms of electronic accessibility, what does your practice routinely allow? (n = 78)	
Email about a medical question or concern	40 (48)
Request an appointment online	20 (24)
Request a prescription online	37 (45)
Request a referral online	9 (11)

## Free-text comments

### Patients' free-text comments

There were seven opportunities for free-text comments in the survey, with 134 patients (31%) providing a median of one response. The main emerging themes were expected use for portals, security and the pros and cons of e-messaging.

### Expected use for portals (69 responses)

Choosing to see their medical records via a portal appears to be a complex decision. Nine respondents said they had no use for this access as they rarely saw their doctor or wanted information. Four felt they would not need to as they did 'not want to override my doctor's professionalism' or 'I trust my doctor'.

Nine patients would like to read their medical record but in conjunction with their doctor or nurse (eg 'Would prefer to go through my notes with my doctor').

The most striking responses were related to aspects of patient engagement (47 respondents). They were curious about the content of their record, wanted to keep up to date, and learn about their health (eg 'remind myself what the doctor has said'). Others wanted to participate actively in their health care (eg 'be accountable for my own health care', 'I might be able to help' and 'so I can see the care I am receiving is appropriate for me'). One person's records had been lost and they wanted to keep a copy for future doctor visits. Others pointed out positive effects

Table 3. Patient and GP responses to the survey

Patients (N = 421)	YES or agree or strongly agree n (%)	NO or somewhat disagree/ disagree n	Don't know/no response n	GP (N = 83)	YES or agree or strongly agree N (%)	NO or somewhat disagree/ disagree	Don't know/no response
I have the right to see and read my medical record	324 (77)	35	62	Patients have a right to see their medical records	76 (92)	2	5
I have asked to see my medical record in the past	121 (29)	281	19	Some of my patients have asked to see their medical record in the past	67 (81)	12	4
In general, it is a good idea for patients to routinely look at their medical record	347 (82)	29	45	In general, it is a good idea for patients to routinely look at their medical record	54 (65)	25	4
I would be interested in seeing my medical records	381 (90)	24	16				
In general, making medical notes available to patients through a secure website is a good idea	298 (71)	72	51	In general, making medical notes available to patients through a secure website is a good idea	44 (53)	34	5
In general, I think it is a good idea to be able to email my doctor through a secure Internet site	281 (67)	47	93	If available, would you like your patients to be able to securely email you or your practice?	42 (51)	24	12
If available, would you like to look at <u>your</u> medical notes using the Internet?	285 (68)	66	70	If available, would you like patients to be able to look at aspects of their medical notes using the Internet?	45 (54)	18	20
Which parts of the medical records would you want to see? (N = 355)*			14	Which parts of the medical records would you be comfortable with for your patients to see?			4
Medical problems	249 (70)	92		Medical problems	36 (43)	43	
Medications	248 (70)	93		Medications	50 (60)	29	
Allergies	232 (65)	109		Allergies	50 (60)	29	
Immunisations	250 (70)	91		Immunisations	51 (61)	28	
Results of blood tests	269 (76)	72		Results of blood tests	42 (51)	37	
x-rays/other test results	255 (72)	86		x-rays/other test results	36 (43)	43	
Reports from hospital/other doctors	248 (70)	93		Reports from hospital/other doctors	37 (45)	42	
Consultation notes	228 (64)	113		Consultation notes	16 (19)	63	
Everything – all the record	210 (59)	131		Everything – all the record	21 (25)	58	

\*Denominator represents those that responded 'yes' or 'don't know' to a question.



Figure 1. Patient and GP expectations about benefits and harms of portal access.

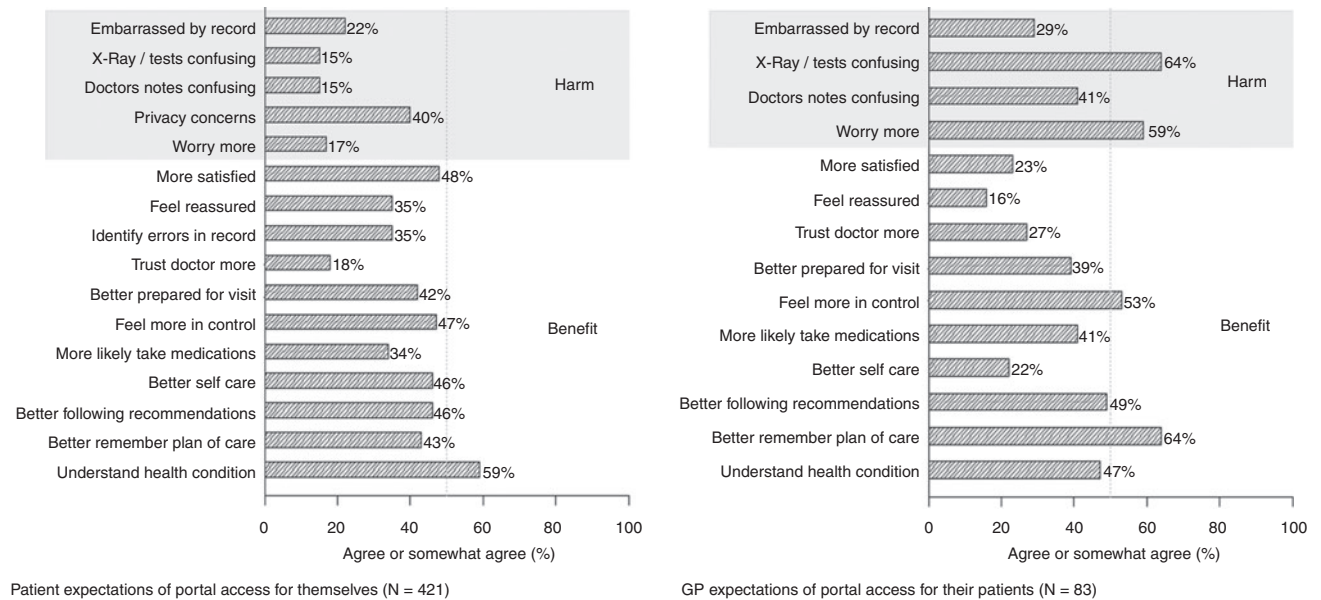
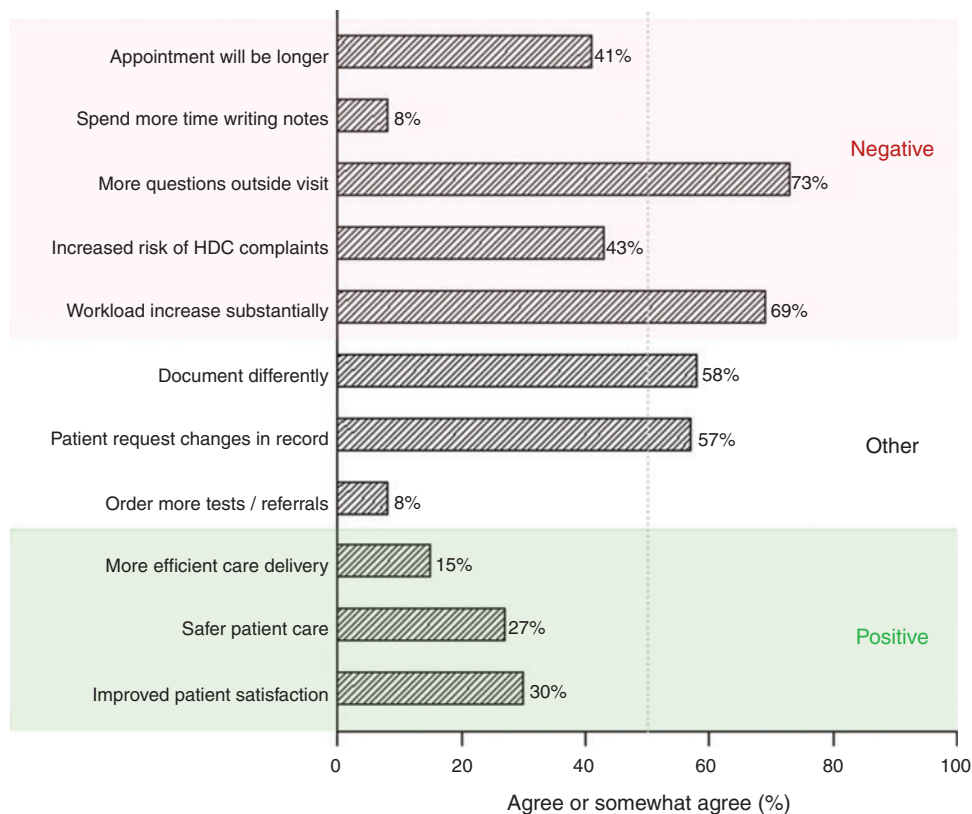


Figure 2. GP expectations about positive or negative aspects for their practice if they allowed portal access for their patients (N = total survey respondents, ie 421 patients or 83 GPs, n = those that responded to specific questions).



(eg 'just being able to keep up to date with medical information' or 'spot patterns' or 'to be able to remember issues that I need to keep an eye on as part of my own personal responsibility for my health'). Three patients wondered about negative effects such as 'those who might take their care into their own hands and make their health far worse than what it should be'.

#### Security (25 responses) and e-messaging (29 responses)

Concerns about security (and associated privacy, confidentiality, identity theft and unauthorised access) were raised as a barrier for people to use a portal to view their medical records. The e-messaging function was seen as very useful and convenient (14 patients).

'[I would] ask about a medical issue and whether he/she recommends me to come in.'

In contrast, six respondents felt it was too impersonal or inappropriate to e-message and preferred the phone or having interactions in-person, and nine patients wondered about resultant workload issues for their GP.

#### **GPs' free-text comments**

There were five opportunities for free-text comments in the survey, with 68 GPs (82%) providing a median of two responses each. These were categorised into three main themes: comfort with online access; the impact portals might have on their patients; and the impact on their practice.

#### Comfort with online access (37 responses)

Ten respondents were comfortable releasing the whole record, stating that they were 'excited', 'it could work' and 'some will use it effectively'. However, 10 others noted nuanced exceptions for selected aspects of the EHR and selected patients, depending on circumstances. For example, if a patient were to receive bad news, it would need to be delivered sensitively (eg 'Some results eg suspicion of cancer need to be communicated face to face and not through the internet.')

Seven noted that they would not want their patients to see sensitive content (eg third party alert,

suspected non-accidental injury), and 10 would not want specific parts of the record (eg their visit notes, specialist letters) or specific patients to see their notes.

#### The impact of portal access on patients (15 responses)

The major concern about patient portal access to the medical record was misinterpretation, causing patients to be worried or confused. Doctors were also concerned about losing the personal touch as patients move online. They indicated that explaining and interpreting results and reports in person was part of their patient relationships, which would need adapting and accommodating if there was electronic release. They reported that 'sometimes patients interpret the medical notes in a different way than intended' and some patients may become unduly concerned at 'minor deviations [of laboratory results] from the normal range'. Six respondents indicated that portal access would probably be fine for most, but the worriers would worry more (eg 'You will have those people for which it consumes their lives... and ours'). One GP indicated that two patients had left their practice after being offended by 'obesity' written in the problem list.

#### The impact of portals on practices (17 responses)

Seven GPs were concerned about the workload implications of portals, anticipating extra time would be needed for explanation and discussions about the record's content (that would not affect an outcome), patients requesting changes or further investigations, ongoing e-consultations and dealing with disagreements and complaints. However, one respondent could see a bright side to portal access suggesting that doctors:

'...will automatically change note-taking style, probably in a good way, to make notes more readable. Finding errors in notes is a very good thing. Disagreeing with what I write is potentially a good thing too, because it potentially opens up important areas for discussion. Confusion over reading notes or lab tests is potentially good for the same reason.'

Some viewed portal implementation as an additional burden to an already demanding job. There were



concerns that the additional work would not be funded, and that patients might develop expectations of free online services to avoid in-person consultations. Five respondents were concerned about cost, billable work and patients' ability to pay. The cost of implementation was raised, and the need for additional staffing to address the extra workload. Four were concerned about the record itself – its purpose, complexity, content and comprehensiveness. A GP pointed out that the medical record:

‘... allows the GP to muse, work on provisional assumptions, formulate opinions and record impressions. It also provides a record of where other individuals, e.g. family members are influencing the diagnosis process and impressions. Some of these factors may not be known to the patient but form an integral part of the rationale as to which path of diagnosis you may head down.’

If they wrote less (to avoid revealing sensitive content) the record would lose useful granularity. However, the converse was also noted – that patients' access to their records may result in more comprehensive and relevant notes of better quality and could result in closer partnerships between patients and doctors.

## Discussion

This study captured patients' and GPs' attitudes, concerns and expectations in the early phases of portal introduction in Auckland region's general practices. One in four patients were unsure about their right to see their medical records, but almost all (90%) were interested in viewing them. Most saw merit in the idea of viewing their records or messaging their practice using the Internet and were interested in the range of information available. Most patients trusted their practice team and did not see portal use as 'checking up' on their doctors but as potentially helping their understanding of their health and medical conditions. Patient concerns were mainly around privacy and Internet security (40%). Most disagreed that they would be more worried, confused or embarrassed by the records.

In contrast, while 65% of GPs surveyed agreed that it was a good idea for patients to view their health records, they were more reticent regarding online

access. Apart from medications, allergies and immunisations, few were comfortable to open up all sections of the EHR, especially visit notes. While GPs thought their patients might understand their plan of care better by reviewing their records online, their major concerns related to causing confusion and worry. Portal implementation was expected to cause an increase in practice workload (mainly due to questions outside of patient visits) and an increase in costs (to implement the portal, staff time, patient expectation of free services), without demonstrable benefit to the practice. Practical concerns related to timing of the release of information (eg bad news), that some aspects of the EHR should not be available online (eg third party information) and access for specific patients may be problematic.

Two previous studies involving New Zealand patients have explored patient portals.<sup>21,22</sup> Patients using portals perceived them to be convenient, time saving (for themselves and their practice) and contribute to efficiency and effectiveness of health-care services.<sup>22</sup> Rural New Zealanders using portals in 2015 described benefits as improved access and understanding laboratory test results, knowing the availability of appointments with their preferred doctor, being able to request repeat prescriptions, and in booking an appointment after hours.<sup>21</sup> These studies support our findings from a diverse sample of Auckland urban patients. Patient interest in viewing their health records online and e-messaging with their health providers is also reported in research from the US, Europe and Scandinavia.<sup>16,17,23,24</sup> Concerns about privacy and security are a recurrent theme; however, such concerns do not deter patients from accessing their visit notes, suggesting that the benefits experienced from online access may outweigh perceived risks for patients.<sup>25</sup>

The 1993 Privacy Act<sup>2</sup> legislated that individuals have the right to access and request corrections to their medical record. Our data suggest this patient right was not fully understood by 23% of the patient respondents. A UK study revealed similar results, with 26% of patients not knowing they had a right to access their records;<sup>16</sup> however, in the same study, only 5% of respondents had actually looked at their health records compared to 29% of our sample of New Zealand patients.

There have been concerns about portals exemplifying the inverse care law<sup>26</sup> – people with most need would be least able to access and use them.<sup>27–29</sup> We found that almost all (96%) patients reported that they used the Internet, suggesting the inverse care law may not apply to portal use. In 2014, 90% of New Zealand households had some form of Internet connection.<sup>30</sup>

Factors influencing adoption of portals by primary care clinicians include lack of familiarity with portals;<sup>31</sup> anticipated new workflow demands;<sup>32</sup> increased unreimbursed workload;<sup>33</sup> confidentiality and privacy concerns;<sup>34</sup> potential for parts of the record to confuse patients;<sup>29</sup> and the potential for complicating rather than improving patient–doctor communication.<sup>14</sup>

In health services where portals have been successfully implemented, patient access to their health records and messaging has been reported to improve communication, patient understanding of health information, engagement and self-management, as well as sharing biomedical information that may result in greater patient safety.<sup>23,24,35–37</sup> There is no evidence of portals causing increased concern or anxiety among patients.<sup>35</sup> However, providing patients with access to health records might interfere with doctors' collection of psychosocial and emotional information, leading to a call for improvements so that portals and EHRs can capture useful data without disturbing patients' and physicians' ability to communicate.<sup>38</sup>

Evidence of time and resource efficiency due to patient portals has been largely descriptive. US doctors using portals found that the technology made their indirect care work easier and it 'just saved time' by reducing telephone tag and providing automatic documentation of patient–provider asynchronous communications.<sup>39</sup> A New Zealand portal evaluation concurred: there could be considerable general practice resource release through low-level tasks, but patient enrolment to portals needed to be at scale to achieve outcomes for practices.<sup>40</sup>

Strengths of this research include the use of previously tested questions with adaptation to the New Zealand context. The quantity of free-text responses

allowed in-depth collection of perspectives and patient participants were sociodemographically diverse. However, the patient sample is small, set in 13 clinical urban settings and most respondents were aged 18–55 years. While efforts were made to invite consecutive patients, in practices with multiple concurrent appointments we often did not have time to invite and explain the study before people were called for their appointment. Completion of demographic details was also hampered as these questions were at the end of the questionnaire, and often coincided with the call for their appointment to begin. Many patients preferred to leave the clinic immediately after seeing their health provider. The sample of GPs was also small and not representative of all New Zealand GPs. Nevertheless, the proportion of GPs having already implemented portals in this study was similar to national estimates and captured both younger and older GPs. A further limitation is that the study data may now be out-dated and did not capture the perspectives of the wider practice team.

Portal implementation requires organisational and practice process changes as well as a culture change in how patient health records can be accessed and shared with patients. Like most new initiatives, portal implementation requires a change management approach and time to embed.<sup>39,41</sup>

By December 2018, approximately half the New Zealand practices offered portals.<sup>3</sup> Despite the interest by our sample of patients in accessing their e-health records and messaging their general practice, only 12% of the enrolled population aged >18 years are currently registered.<sup>3</sup> In an era of rising acute demand for health care, an ageing population and increasing multimorbidity, patients represent a large untapped resource for supporting their own health care and understanding their health conditions. Portals could facilitate this social movement.

## Competing interests

Dr Wells reports grants from Health Research Council of New Zealand and a Fellowship from The Stevenson Foundation during the conduct of the study. Outside the submitted work, she has received research grants from Roche Diagnostics Ltd and the National Heart Foundation of New Zealand. All other authors declare no conflicts of interest.

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## References

1. Vilhelmson B, Thulin E, Eldér E. Where does time spent on the Internet come from? Tracing the influence of information and communications technology use on daily activities. *Informat Commun Soc.* 2017;20(2):250–63. doi:10.1080/1369118X.2016.1164741
2. Office of the Privacy Commissioner. Health Information Privacy Code 1994. Wellington: Privacy Commissioner Te Mana Matapono Matatapu; 1994 [cited 2015 May 25]. Available from: <https://www.privacy.org.nz/the-privacy-act-and-codes/codes-of-practice/health-information-privacy-code/>
3. Ministry of Health. Patient portals. Wellington: Ministry of Health; 2018 [cited 2018 October]. Available from: <http://www.health.govt.nz/our-work/ehealth/other-ehealth-initiatives/patient-portals>
4. National Health IT Board. National Health IT Plan: enabling an integrated healthcare model. Wellington: Publisher; 2010. [cited 2018 October]. Available from: <http://www.ithhealth-board.health.nz>
5. Patients First. Patient Portals PMS Review 2. Briefing 1 of the 2014 PMS Review Briefing Series. Wellington: Patients First and National Institute of Healthcare Innovation; 2014.
6. Ferreira A, Correia A, Silva A, et al. Why facilitate patient access to medical records. *Stud Health Technol Inform.* 2007;127:77–90.
7. Honeyman A, Cox B, Fisher B. Potential impacts of patient access to their electronic care records. *Inform Prim Care.* 2005;13(1):55–60.
8. Ball MJ, Smith C, Bakalar RS. Personal health records: empowering consumers. *J Healthc Inf Manag.* 2007;21(1):76–86.
9. Bichel A, Erfle S, Wiebe V, et al. Improving patient access to medical services: preventing the patient from being lost in translation. *Healthc Q.* 2009;13(Sp):61–8. doi:10.12927/hcq.2009.21100
10. Ross SE, Lin C-T. The effects of promoting patient access to medical records: a review. *J Am Med Inform Assoc.* 2003;10(2):129–38. doi:10.1197/jamia.M1147
11. Bloch S, Riddell CE, Sleep TJ. Can patients safely read their psychiatric records? Implications of freedom of information legislation. *Med J Aust.* 1994;161(11):665–6. doi:10.5694/j.1326-5377.1994.tb126913.x
12. Rogers EM. *Diffusion of Innovations*. 4th edn. New York: The Free Press; 1995.
13. Delbanco T, Walker J, Bell SK, et al. Inviting patients to read their doctors' notes: a quasi-experimental study and a look ahead. *Ann Intern Med.* 2012;157(7):461–70. doi:10.7326/0003-4819-157-7-201210020-00002
14. Delbanco T, Walker J, Darer JD, et al. Open notes: doctors and patients signing on. *Ann Intern Med.* 2010;153(2):121–5. doi:10.7326/0003-4819-153-2-201007200-00008
15. Walker J, Leveille SG, Ngo L, et al. Inviting patients to read their doctors' notes: patients and doctors look ahead: patient and physician surveys. *Ann Intern Med.* 2011;155(12):811–9. doi:10.7326/0003-4819-155-12-201112200-00003
16. Pyper C, Amery J, Watson M, et al. Access to electronic health records in primary care—a survey of patients' views. *Med Sci Monit.* 2004;10(11):SR17–22.
17. Ross SE, Todd J, Moore LA, et al. Expectations of patients and physicians regarding patient-accessible medical records. *J Med Internet Res.* 2005;7(2):e13. doi:10.2196/jmir.7.2.e13
18. Urowitz S, Wiljer D, Apatu E, et al. Is Canada ready for patient accessible electronic health records? A national scan. *BMC Med Inform Decis Mak.* 2008;8:33. doi:10.1186/1472-6947-8-33
19. Ministry of Health. PHO Enrolment Demographics 2017 Q4 (October to December 2017). Wellington: Ministry of Health; 2017 [cited 2018 January 8]. Available from: <https://www.health.govt.nz/our-work/primary-health-care/about-primary-health-organisations/enrolment-primary-health-organisation>
20. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005;15(9):1277–88. doi:10.1177/1049732305276687
21. Carryer J, Kooienga S. Patients' experience and understanding of E-portals in rural general practice: an ethnographic exploration. *J Prim Health Care.* 2017;9(4):262–68. doi:10.1071/HC17016
22. Gu Y, Day K. Propensity of people with long-term conditions to use personal health records. *Stud Health Technol Inform.* 2013;188:46–51.
23. Goldzweig CL, Orshansky G, Paige NM, et al. Electronic patient portals: evidence on health outcomes, satisfaction, efficiency, and attitudes: a systematic review. *Ann Intern Med.* 2013;159(10):677–87. doi:10.7326/0003-4819-159-10-201311190-00006
24. Irizarry T, DeVito Dabbs A, Curran CR. Patient portals and patient engagement: a state of the science review. *J Med Internet Res.* 2015;17(6):e148. doi:10.2196/jmir.4255
25. Vodicka E, Mejilla R, Leveille SG, et al. Online access to doctors' notes: patient concerns about privacy. *J Med Internet Res.* 2013;15(9):e208. doi:10.2196/jmir.2670
26. Tudor Hart J. Commentary: three decades of the inverse care law. *BMJ.* 2000;320(7226):18–9.
27. Goel MS, Brown TL, Williams A, et al. Disparities in enrollment and use of an electronic patient portal. *J Gen Intern Med.* 2011;26(10):1112–6. doi:10.1007/s11606-011-1728-3
28. Sarkar U, Karter AJ, Liu JY, et al. Social disparities in internet patient portal use in diabetes: evidence that the digital divide extends beyond access. *J Am Med Inform Assoc.* 2011;18(3):318–21. doi:10.1136/jamia.2010.006015
29. Yamin CK, Emani S, Williams DH, et al. The digital divide in adoption and use of a personal health record. *Arch Intern Med.* 2011;171(6):568–74. doi:10.1001/archinternmed.2011.34
30. Statistics New Zealand. Internet Service Provider Survey: 2014. Wellington: Statistics New Zealand; 2014.
31. Witry MJ, Doucette WR, Daly JM, et al. Family physician perceptions of personal health records. *Perspect Health Inf Manag.* 2010;7:1d.
32. Nazi KM. The personal health record paradox: health care professionals' perspectives and the information ecology of personal health record systems in organizational and clinical settings. *J Med Internet Res.* 2013;15(4):e70. doi:10.2196/jmir.2443
33. Vydra TP, Cuaresma E, Kretovics M, et al. Diffusion and use of tethered personal health records in primary care. *Perspect Health Inf Manag.* 2015;12:1c.
34. Ludwick DA, Doucette J. Adopting electronic medical records in primary care: lessons learned from health information systems implementation experience in seven countries.

- Int J Med Inform. 2009;78(1):22–31. doi:10.1016/j.ijmedinf.2008.06.005
35. Davis Giardina T, Menon S, Parrish DE, et al. Patient access to medical records and healthcare outcomes: a systematic review. *J Am Med Inform Assoc*. 2014;21(4):737–41. doi:10.1136/amiajnl-2013-002239
36. Mold F, de Lusignan S, Sheikh A, et al. Patients' online access to their electronic health records and linked online services: a systematic review in primary care. *Br J Gen Pract*. 2015;65(632):e141–51. doi:10.3399/bjgp15X683941
37. Zanaboni P, Ngangue P, Mbemba GIC, et al. Methods to evaluate the effects of internet-based digital health interventions for citizens: systematic review of reviews. *J Med Internet Res*. 2018;20(6):e10202. doi:10.2196/10202
38. Rathert C, Mittler JN, Banerjee S, et al. Patient-centered communication in the era of electronic health records: What does the evidence say? *Patient Educ Couns*. 2017;100(1):50–64. doi:10.1016/j.pec.2016.07.031
39. Wells S, Rozenblum R, Park A, et al. Organizational strategies for promoting patient and provider uptake of personal health records. *J Am Med Inform Assoc*. 2015;22(1):213–22.
40. Love T, Boyle R. Resource impacts of ePortals for general practice. Wellington: Sapere Research Group; 2015.
41. Boonstra A, Broekhuis M. Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. *BMC Health Serv Res*. 2010;10:231. doi:10.1186/1472-6963-10-231