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# Community perspectives on the use of electronic health data to support reflective practice by health professionals

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## Abstract

**Background** Electronic health records and other clinical information systems have crucial roles in health service delivery and are often utilised for patient care as well as health promotion and research. Government agencies and healthcare bodies are gradually shifting the focus on how these data systems can be harnessed for secondary uses such as reflective practice, professional learning and continuing professional development. Whilst there has been a presence in research around the attitudes of health professionals in employing clinical information systems to support their reflective practice, there has been very little research into consumer attitudes towards these data systems and how they would like to interact with such structures. The study described in this article aimed to address this gap in the literature by exploring community perspectives on the secondary use of Electronic Health Data for health professional learning and practice reflection.

**Methods** A qualitative methodology was used, with data being collected via semi-structured interviews. Interviews were conducted via phone and audio recordings, before being transcribed into text for analysis. Reflective thematic analysis was undertaken to analyse the data.

**Results** Fifteen Australians consented to participate in an interview. Analysis of interview data generated five themes: (1) Knowledge about health professional registration and professional learning; (2) Secondary uses of Electronic Health Data; (3) Factors that enable the use of Electronic Health Data for health professional learning; (4) Challenges using Electronic Health Data for health professional learning and (5) Expectations around consent to use Electronic Health Data for health professional learning.

**Conclusions** Australians are generally supportive of health professionals using Electronic Health Data to support reflective practice and learning but identify several challenges for data being used in this way.

**Keywords** Digital health, Electronic health data, Reflective practice, Informatics

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## Background

Clinical Information Systems (CIS), such as electronic health records and patient administrative systems, have had a transformative effect across the health sector. These technologies collect a considerable amount of data on health and wellbeing that can be harnessed for a range of applications. Primary uses of these data, i.e. uses that the technologies were intentionally designed to support, include enabling health professionals to record data about patient care and access data for delivery of patient care. Secondary uses of these data include health promotion, audit, feedback and research [1]. Another secondary use that government agencies and peak bodies in healthcare are increasingly focusing on is harnessing these data for reflective practice, health professional learning and continuing professional development. Reflective practice describes the process of revising experiences to better understand complex problems in professional contexts and potentially learn from them [2], and is recognised as an essential process for health professionals to refresh and update their knowledge [3]. Whilst there is an emerging body of research exploring the attitudes of health professionals to the secondary use of Electronic Health Data (EHD) for this purpose [4–7], currently there is no research into consumer attitudes towards this use. This is a problem because EHD is data about consumers and their interactions with the health system, and yet their views on how it should or should not be used to support reflective practice are currently unknown.

EHD is broadly defined as health and medical data about a person that is stored digitally. It can include biometric data from personal devices such as smart watches or mobile apps, and the range of data stored electronically by health services (for example, medications, diagnoses, test results, practitioner notes, and number of visits). Access to and use of the vast amount of EHD can have multiple benefits for the health system including improving the quality of care by providing timely access to data for health professionals [8] and generating new evidence to support quality improvement and decision making [9]. The secondary use of EHD to support research activities has been a particular focus of the literature to date, with the ability of these systems to support direct integration of randomized controlled trials at large-scale being identified as a specific benefit [10]. Further to this, a significant body of research has explored the secondary use of EHD to support quality improvement activities in the health sector. In one instance toolkits were integrated into clinical information systems to support standardised data collection which was subsequently used to trigger alerts notifying health professionals when an issue has been identified in the data [11]. In another instance data was extracted from clinical information systems and benchmarked against indicators from a national quality

improvement program to support systematic changes and improve outcomes in practice [12].

In addition to the secondary uses described above, there is growth in literature exploring the role of EHD in reflective practice, workplace learning and professional development. The field of research exploring the secondary use of EHD for this purpose is termed Practice Analytics. Practice Analytics describes an emerging field of enquiry exploring how integrated and routinely collected electronic data sets can be effectively leveraged to enable professionals to optimize, improve, or enhance the value of outputs in the sector they work in [5]. In healthcare this field focuses on harnessing EHD sets from CIS to understand how data can support reflective practice, continuing professional development and workplace learning [4–7]. In the Australian context, foundational work has been undertaken in the field of Practice Analytics exploring the perspectives and attitudes of health professionals towards the utility of EHD to support reflective practice and continuing professional development, including the extent to which current clinical information systems enable this secondary use [5, 7]. Coupled with this there is literature on how EHD can be analysed and visualised in order to facilitate performance review and reflection [4], and the processes health professionals engage in when trying to make sense of these data to understand their performance [6]. Internationally, there are also a small number of examples of EHD being utilised to support reflective practice. In the United States of America, EHD was used to develop and validate a model for identifying skill gaps in health professionals to help inform their selection of continuing professional development activities to address these gaps [13]. In the Canadian context, research was undertaken to investigate the factors that influence health professionals' engagement with practice data for learning and reflection [14].

Consumers may also benefit from investment into infrastructure to increase the accessibility of health data as it could improve consumer access to their own health data [15]. Generally, consumers are supportive of secondary uses of data if there is a social benefit [16, 17]. Research, however, indicates that issues such as privacy concerns, lack of awareness of the value of the contribution, concerns about data being used for profit and lack of easy tools to share data [18] and in some instances nationality, can be a barrier to consumer support for the secondary use of their health data. In addition to these known issues, research to date has focused on consumer perspectives on very specific secondary use cases of EHD including for research [15, 17] or quality improvement activities that could improve care delivery for future patients [19, 20].

There is a notable gap in the literature related to consumer perspectives on Practice Analytics, the secondary

use of EHD by health professionals to support their learning and continuing professional development. This gap is concerning as this data is about consumers and without understanding their perspectives on its secondary use, the health sector is unlikely to use EHD in a way that aligns with consumer expectations and values. Coupled with this, despite policy drivers gradually motivating health professionals to engage with their data to reflect on their practice, many barriers prevent engagement in data-driven learning and continuing professional development [21]. Consumer support or expectation that health professionals engage in reflective practice using EHD may serve as an additional motivator to undertake such activities, as it is known that consumer support can facilitate health workforce adoption of interventions in other contexts [22]. Engaging in reflective practice is an important process for health professionals to understand their performance and potentially learn from it, improving care processes and outcomes. As the recipients of care delivered by the health system, consumers benefit from actions taken by health professionals that can ensure high-quality care is delivered across the sector.

## Methods

### Aim/Hypothesis

The aim of this study was to explore community perspectives on the secondary use of EHD for health professional learning and practice reflection. Secondary aims of the study included scoping individual knowledge of how health professionals stayed up to date on best practice and describing some challenges and enablers for harnessing EHD to support professional learning.

### Study setting and participants

Potential participants were Australian residents over the age of 18 who were interested in discussing the collection and secondary use of EHD. Participants were excluded from participation if they were under the age of 18.

The study aimed to recruit between 15 and 20 participants over an 18 month recruitment window. Although the size at which saturation occurs in qualitative research is debated [23], this sample size aligns with those used in similar studies.

Recruitment was via email notices, flyers on university campuses, social media posts on the researchers' professional profiles and paid Facebook advertisements. Promotional materials contained a link to a Participant Information Sheet and an anonymous online survey consisting of validated instruments sourced by the authors for this study. At the conclusion of the survey, respondents were provided information to express interest in being contacted by a member of the research team about participating in a research interview. If participants

indicated that they were interested, a member of the research team would contact them to arrange a time to conduct it.

### Study design

A qualitative methodology was used for the study. Data was collected via semi-structured interviews in order to collect rich data on participants' understanding of how healthcare organisations collected EHD, and their perspectives on its secondary use to support reflective practice.

### Data collection and procedures

A semi-structured interview guide developed by the researchers was used to collect data for the study. *Refer to supplementary files for a copy of the interview guide.* Semi-structured interviews were conducted via phone and audio recorded. Interviewees were informed that the interview would be audio-recorded at the start of the interview and then confirmed their consent to participate. Participants were asked about the activities they believe health professionals engage in to stay up to date on latest evidence, the types of data they feel healthcare organisations collect, and their perspectives on how health professionals are and should be using these data. At the start of the interview a small selection of demographic questions were asked including participants age and whether they felt they had a high level of interaction with the health system. Interviews ranged from 39 min to 85 min. The recording from each interview was transcribed into text, and then de-identified before analyses.

### Data analysis

Data collected via the transcripts was analysed using reflexive thematic analysis by Author1 [24]. Each transcript was read by the researcher to thoroughly familiarise with the dataset. Subsequently each transcript was coded using descriptive labels, and initial themes were generated. The initial themes were reviewed and refined until final themes were defined and exemplar quotes were extracted from the data to illustrate the key themes.

## Results

A total of 15 participants aged between 20 and 86 years of age (median=62 years, SD=15.76 years) were interviewed about their perspectives on secondary use of health data to support health professional learning. The majority of participants indicated they had a high level of interaction with the health system ( $n=12$ , 80%). Of these participants one was a retired health professional, and all others had interacted with the system exclusively as consumers.

Analysis of the interview data identified five themes:

- Knowledge about health professional registration and professional learning.
- Secondary Uses of EHD.
- Factors that enable use of EHD for health professional learning.
- Challenges using EHD for health professional learning.
- Expectations around consent to use EHD for health professional learning.

A summary of the results from each theme is described in the following sections. Refer to Table 1 for an overview of exemplar quotes presented by theme and sub-theme.

### Knowledge about health professional registration and professional learning

All interviewees felt that health professionals had to do some continuous professional development to maintain their registration to practice once it had been obtained. The majority of interviewees perceived that professional development for health professionals involved regular training and/or some form of formal tracked professional development, and two participants thought these were mandated either by the professional college or employers. Participants believed that professional development activities included attending conferences and seminars, reading journals and participating in journal clubs. Several interviewees also felt that peer feedback and discussion was likely to be another mechanism health professionals used to stay up to date. A smaller number of respondents believed there would also be some form of re-assessment of health professional competency to practice periodically to maintain their license, or that health professionals would have to provide evidence that their practice aligned with best practice guidelines. One participant noted:

*I would expect that they stay current with medical developments, particularly in their specific field of expertise. And that would also be just professional development activities, which might be include relating to internet or medical records online and things. Things they need to be aware of, and things change. - PCP\_09 (65yo, moderate level of health service interaction).*

### Secondary uses of electronic health data

Interviewees perceived healthcare organisations to be collecting a large amount of EHD. There was a number of secondary uses that interviewees felt this EHD could be used for including improved information sharing between health professionals; healthcare organisation

service provision; identifying/responding to population health trends; and health messaging/education.

When asked about secondary use of EHD for health professional learning and practice reflection (Practice Analytics) all interviewees were supportive of the concept, though many hadn't previously thought about secondary use of data for this purpose. One participant said:

*That would be fine. Because it will lead to a better outcome for an old patient. It's part and parcel of a learning process... I mean, if you're going to learn, they've got to be able to go through that data. They've got to be able to. - PCP\_14 (70yo, low level of health service interaction).*

Most participants viewed EHD as a core mechanism to understand performance and harnessing it for reflective practice as essential for learning and ultimately providing good care. A number of participants felt using EHD for reflective practice was a sign of professionalism and interest in the patient and improving care. Relatedly, one interviewee was supportive of the concept if it was ultimately for the betterment of patients. Another interviewee felt that use of EHD for reflective practice may be beneficial for improving the quality of data captured in CIS, as health professionals would be able to identify gaps and errors. Another felt there may even be ways to engage patients in the process, stating:

*Perhaps you could even involve the patient in the reflection process, I think that would make sense. And if they have something to think about and to improve, and could probably just like also ask the patient like, 'What did you think?' And something like that. And probably also train about using technology properly and things like that, and how you use the data and what you're doing with it. Yeah, transparency. You should have it be transparent that, 'This is what we will do.' - PCP\_03 (20yo, high level of health service interaction).*

Interviewees were also asked to reflect on the concept of teams of health professionals engaging in Practice Analytics. As with the use of EHD by individual health professionals for this purpose, most interviewees were supportive. However, some interviewees felt that when EHD was being used for team reflection the identity of the patient should be anonymous. This concern was not raised by interviewees when the practice reflection was being undertaken by their treating physician.

**Table 1** Exemplar quotes presented by theme and sub-theme

Theme	Sub-Theme	Quote	Participant
Knowledge about medical practitioner registration and professional learning	Regular Training and Continuing Professional Development	It's usually like you do your professional development, you're like learning about new research in health, and things like that.	PCP_03 (20yo, high level of health service interaction)
		My understanding is they have to get a certain number of education points or something, I don't know exactly what the jargon is, for them to be able to continue with their licence... That's all types of medical practitioners, whether they're physicians or general practitioners or specialists or whatever.	PCP_05 (69yo, high level of health service interaction)
		I would expect that they stay current with medical developments, particularly in their specific field of expertise. And that would also be just professional development activities, which might be include relating to internet or medical records online and things. Things they need to be aware of, and things change.*	PCP_09 (65yo, moderate level of health service interaction)
	Re-validation	there should be, look, as there is with licences to drive cars, if you're going to be licensed to cut someone open and work on their heart, there probably should be a point where you're re-confirmed to assure that you can still competently perform that operation. Whether that's every two years, five years, I don't know. Probably depends upon the person, the age, whatever. Yeah, they should be re-tested, if that's the right word.	PCP_04 (60yo, high level of health service interaction)
		I would expect that there'd be regular annual big sort of reviews in the practice in their accreditation... And I would expect they're obliged to indicate on a regular basis their awareness and adherence to any changes in legislation or policies or anything that might come out either from the federal health departments, as well as their own peak body.	PCP_06 (60yo, low level of health service interaction)
	Conferences and Seminar Participation	I think they have to go to seminars but I'm not aware that their practise gets checked out. Like I say, a nursing home would be checked out.	PCP_08 (63yo, low level of health service interaction)
		I think absolutely. I think it's a necessity in most professions and even if it wasn't, I think it would be quite slack of a medical person, any medical professional not to want to keep up with what's current, so there'd be webinars and Zooms and all those things for people that can't get into face-to-face training.	PCP_07 (63yo, high level of health service interaction)
	Reading Journals	Well in the past, probably attending conferences, reading journals.	PCP_02 (74yo, high level of health service interaction)
		I think it could be everything from reading journal articles, seminars and these days, webinars.	PCP_05 (69yo, high level of health service interaction)
	Peer Feedback and Discussion	I think peer discussions. If we're talking about general practitioners, for example, peer discussions either within a group of practitioners or something that's facilitated by the local PHN.	PCP_05 (69yo, high level of health service interaction)
I would expect that they would be doing a far bit of professional reading and just discussions with other medical professionals in the field.		PCP_09 (65yo, moderate level of health service interaction)	
Mandatory Training	I think certainly they should be getting whatever comes from the peak body in their specialist area. And I think they should, may not be, but I think they should be engaged in any areas of specialisation... I would hope there's some obligations, that would oblige them to keep in touch with emerging research and trends.	PCP_06 (60yo, low level of health service interaction)	
	The employer or whoever, whatever medical group they're working with would provide professional development activities.	PCP_09 (65yo, moderate level of health service interaction)	

**Table 1** (continued)

Theme	Sub-Theme	Quote	Participant
Secondary Use of Electronic Health Data	Information sharing between health professionals	I would like to think that in the perfect world that would be happening all the time, there'd be a collaborative approach, and that the GP who I see every week would be fully aware of the operation I had and the outcomes, and why this medication was prescribed. It doesn't happen, probably because of time constraints, but I would think that would be the most desirable situation.	PCP_04 (60yo, high level of health service interaction)
	Health care organisation service provision	I think I would hope that it helps them make sure that they've got the right mix of expertise ... And it may highlight either at a practice level or at a hospital level, that they might have a gap in up-to-date knowledge.	PCP_06 (60yo, low level of health service interaction)
		I would think healthcare providers, they're going to have the data for the people within their catchment. So they will know how many people have been admitted to hospital and how long hospital stays are, et cetera, because they need to work out their costs and insurance levels.	PCP_09 (65yo, moderate level of health service interaction)
	Identifying population health trends	I think also geographically there may be a useful in terms of particular illnesses appearing that they weren't expecting that there will be an emergence of a particular condition amongst kids or the community. There's often those outbreaks you would here about in regional health groups. There's an emergence of cases that may not otherwise look connected. And I would hope that doctors and health professionals could be sorted it out looking at that data.	PCP_09 (65yo, moderate level of health service interaction)
	Health messaging	I think there's a whole range of ways that that sort of data can be used. Again, it's de-identified data, so it's about public health messaging, epidemiological, infectious disease stuff, as well as building the capacity of the clinician to treat that condition better.	PCP_05 (69yo, high level of health service interaction)
	Reflective Practice and Learning	I think I very much support it. I think that they should be doing that.	PCP_02 (74yo, high level of health service interaction)
		I suppose like professionally, doctors and health professionals that reflect on what they've done, and how they've done it, and whether or not they did a good job or not. So you'd always kind of be reflecting on that hopefully, so then you know, actually provide good care. Yeah. So I'd expect them to be reflecting on what care they provided and things like that.	PCP_03 (20yo, high level of health service interaction)
		Yeah. So they've entered me. I've been there two days, had the procedure, I'm fine. I'm to think about them looking at all of my information and how they've used it? Look, I would totally encourage it, I think. I don't think they do it enough, as far as I can see. I think they should do it a lot more often. I think it's probably one of the many very basic teaching tools they have at their disposal to educate themselves and those around them, and certainly those they're training.	PCP_04 (60yo, high level of health service interaction)
		Look, I don't have a problem with that because the fact that they're called health professionals underlines the whole professional stuff. I think most health professionals understand about patient confidentiality.	PCP_05 (69yo, high level of health service interaction)
		I think that would be perfectly reasonable. And I think that's pertinent again, to really get gaining best outcomes for the patients.	PCP_15 (45yo, high level of health service interaction)
		Absolutely fine. Yep, because it's often not until patients leave that doctors have got time.	PCP_07 (63yo, high level of health service interaction)
		Oh, yeah. Absolutely. I'm sure there's always things they can learn at looking back. Yeah. And perhaps, consulting with other doctors or healthcare professionals about different ways they've handled different things.	PCP_13 (58yo, medium level of health service interaction)
		I think it's great. Like for them to look at that [data] and take that seriously I think it's fantastic because it means they're really interested in what has happened and you're actually review it. So there has to be better for other patients will come in.	PCP_06 (60yo, low level of health service interaction)
		Absolutely fantastic, because I'm going to benefit from it when other people do it... If they do it to my data, another person is going to benefit from it, and that makes me feel good. You know, warm fuzzies.	PCP_11 (61yo, high level of health service interaction)
		I think it's fantastic. I think that's just a dream scenario that people from the teams because everyone brings their different specialist knowledge and together they're probably going to see things that one doctor by themselves may not see. So I think that's fantastic. I would agree with that. A team reviewing things collaboratively would be a very good thing I would think.	PCP_06 (60yo, low level of health service interaction) PCP_11 (61yo, high level of health service interaction)

**Table 1** (continued)

Theme	Sub-Theme	Quote	Participant
Factors that enable use of Electronic Health Data for medical practitioner learning	Guidance and funding from government agencies and peak bodies	I've never thought of that. I have never thought of that. That's something that I hadn't thought of. Again, if it's for the betterment of people, I don't think I'd have a problem. I'd feel absolutely fine about that. Again, if a doctor and his cohorts were looking for the betterment, I would like to be advised of that. As I said, again, if it's for the betterment of people and patients, I think that's okay. That would be fine. Because it will lead to a better outcome for an old patient. It's part and parcel of a learning process... I mean, if you're going to learn, they've got to be able to go through that data. They've got to be able to. I think they < governments and peak bodies> can be involved, they set kind of the guidelines for what you're doing and how you're doing it, and they could just say that, "This is what you should not, what you shouldn't do," things like that.	PCP_07 (63yo, high level of health service interaction) PCP_07 (63yo, high level of health service interaction) PCP_14 (70yo, low level of health service interaction) PCP_03 (20yo, high level of health service interaction)
	Design of Clinical Information Systems	I'd say it would be a major project by something like the < funder name> So yeah, some government or non-government organisation. I'd say really that should be government talking to the College < Name>, and letting the College < Name> manage that sort of thing, because they're better able to understand the pressures... I think that's going to be the better arrangement. I don't think they should be wasting their time on stuff that doesn't need that level of attention paid to it. I think we can be using AI and some of the analytics to be doing a lot of that kind of work and just pumping up anomalies. But in that case, then they should be taking that look at that 1% of cases to try and improve the state of things. Basically the way that medical records are stored, there's very little tracking of what's changing over time. So just manually looking back through someone's record is probably not going to give you the full information. You need something to analyse that data time targets or they show it on some sort of graph or something like that, to be able to know which is the relevant data you should be looking at. perhaps you could even involve the patient in the reflection process, I think that would make sense. And if they have something to think about and to improve, and could probably just like also ask the patient like, "What did you think?" And something like that. And probably also train about using technology properly and things like that, and how you use the data and what you're doing with it. Yeah, transparency. You should have it be transparent that, "This is what we will do." Absolutely. I'm sure there's always things they can learn at looking back. Yeah. And perhaps, consulting with other doctors or healthcare professionals about different ways they've handled different things.	PCP_02 (74yo, high level of health service interaction) PCP_11 (61yo, high level of health service interaction) PCP_01 PCP_02 (74yo, high level of health service interaction) PCP_03 (20yo, high level of health service interaction)
Challenges using Electronic Health Data for medical practitioner learning	Data Linkage	Correlate the data from different organisations. If somebody is living in Queensland and moved to New South Wales, they probably left most of the data behind them. So the doctor won't have the historical records unless it's coordinated nationally or even internationally when people move countries.	PCP_13 (58yo, medium level of health service interaction) PCP_02 (74yo, high level of health service interaction)
	Reflecting on patients outside individual scope of care	Like you can reflect on what you did with a patient, like you wouldn't be reflecting on what someone else did with the patient. So you're just reflecting on what you did.	PCP_03 (20yo, high level of health service interaction)



**Table 1** (continued)

Theme	Sub-Theme	Quote	Participant
		I think when it becomes an aggregate experience, it should be de-identified. But they can move away from that fine relationship of trust that you established with a treating doctor to an environment that sort of echoes more public and I think it would have to be de-identified. I had a core feeling that you do have a great trust with the treating doctor and that's what you buy into in a way. But I think once it goes to the team, I think it should be, you know, of any age and background and family history that sort of stuff. I think it should be de-identified. That the concern would be once your name becomes public, that's where you have no idea where it will end up.	PCP_06 (60yo, low level of health service interaction)
		if it was a practitioner that was working with the patient. I wouldn't say just any practitioner should have access to it... I think that they should certainly know the patient	PCP_02 (74yo, high level of health service interaction)
		if it's just that doctor looking at it themselves. Yeah, that's fine. Yeah. But if it's going to other doctors and whatever, those are better to be de-identified.	PCP_13 (58yo, medium level of health service interaction)
	Limited time/no reimbursement	I think in general practise for probably 99% of things, they wouldn't have the time to be able to do it, and certainly Medicare wouldn't be funding them in any way to do it.	PCP_01
	Caseload gaming	certainly, it'd be a good idea but I don't know whether they'd have time to do it at the moment, they need some support to be able to do that I think That's a very vexed one which is, it's a real problem... For instance, if you're a surgeon specialising in an operation, which can have a reasonable mortality rate, and if you're going to be judged on your excellence as a surgeon on your mortality rate, you're probably less likely to accept patients who might be in that risk field. You probably send them off somewhere else, or just say, "Look, I don't think I'll touch you." Because at the end of the day, you know that you're going to be assessed through the hospital system and people are going to say, "This person's had a 5% fatality rate doing this operation. He can't be any good." When it's just as likely that the people that he's operated on would all have died anyway, plus a few more.	PCP_02 (74yo, high level of health service interaction) PCP_14 (70yo, low level of health service interaction)
	Inaccurate or incomplete data	I'd be very worried about it at the moment because I'm aware of the particular case, where several different specialists produced different records and only one out of the three made its way onto the discharge report. But the two didn't. So, anyone who's looking at that data afterwards probably got a very incomplete idea of what actually happened.	PCP_02 (74yo, high level of health service interaction)
Consent for secondary use	If patient is identified	I also wonder under what cases should that data be more broadly available, so researchers, pharmaceutical companies, health insurance companies. I would hate for a health insurer to have my specific data and up my premiums dramatically... But I could see that anonymized data could be very useful to any number of organisations in improving healthcare in general. So depending on the kind of organisation it is, I would be quite happy for people to have access to anonymized and rolled-up views of my data.	PCP_01
	Ideally/would be nice	I think I would expect to be informed if they were identifying the data as mine. Yes, for sure. But not otherwise, if it's just improving their processes, that wouldn't bother me. But if they were writing a paper on it and it said patient so-and-so did this, then no. They should either get the consent of the patient or just de-identify it. The issue is of course it's very hard to de-identify individual cases sometimes.	PCP_02 (74yo, high level of health service interaction)
	Use for reflective practice	In my health record, there is a, like a checkbox saying that your data has been accessed for some reason, and letting a person know. You can say, "Yeah, I want to know something." That could certainly be made more fine-grained to allow for that sort of thing, especially if that was properly federated and more complete... That principle, I think, could be applied to the records everywhere, whether it was... So if there were more complete records at a hospital or at a GP, the patient could say, "Yeah, look, I'm..." Upright, "This is what I'm interested in being told about," so you don't... And then that would solve that problem. you should probably tell the patients that you're going to reflect on what happened with them and things like that.	PCP_11 (61yo, high level of health service interaction)
		It's a learning tool for the health practitioner. I get a lot out of it too... The issue for me is around informed consent. Yeah, informed consent, full stop, and most of it being de-identified... I think I would like to see some informed consent around that. I think that would be ideal. Yeah. I don't think I need to. I think the qualification I made before is as long as it's de-identified data for the team.	PCP_03 (20yo, high level of health service interaction) PCP_05 (69yo, high level of health service interaction) PCP_06 (60yo, low level of health service interaction)



**Table 1** (continued)

Theme	Sub-Theme	Quote	Participant
		I don't think that's something they should be doing without expressed consent. I think once it gets to that level, I mean, again, I think it's just a general courtesy to let someone know that they were doing that, although now that you said that, they probably already are. It makes sense that they would be.	PCP_07 (63yo, high level of health service interaction)
		Just letting the patient know that we are having a team meeting where we're going to discuss your case. If it's reflecting, I don't think there's a need for the patient to necessarily know, unless there's some learning from the reflection that's got an immediate application to the patient.	PCP_09 (65yo, moderate level of health service interaction)
		I think there still needs to be the caveat of people at that initial point of entry, having the ability to be able to opt in and opt out of that. So, this should be a clear statement. Are you happy to have your information used in this way? And really clear clause statements about how it won't be used.	PCP_15 (45yo, high level of health service interaction)

**Factors that enable use of electronic health data for health professional learning**

Some interviewees had suggestions on factors that could enhance health professionals' ability to engage in Practice Analytics. The most commonly cited enabler was guidelines on how to use EHD in this way from government agencies and peak bodies and/or funding to support development of tools to make data access easier. Some interviewees suggested that improving the design of CIS or incorporating scaffolding related to reflective practice would be another enabler for using EHD in this way. Further, some interviewees felt that engaging patients or peers in the process might strengthen it. One interviewee felt that data linkage would be a key enabler.

*Correlate the data from different organisations. If somebody is living in Queensland and moved to New South Wales, they probably left most of the data behind them. So the doctor won't have the historical records unless it's coordinated nationally or even internationally when people move countries. – PCP\_02 (74yo, high level of health service interaction).*

**Challenges using electronic health data for health professional learning**

Interviewees identified several challenges to engaging in Practice Analytics. Several interviewees raised concerns about EHD being used by health professionals for reflection if it was for patients outside their scope of care. Another concern related to how busy health professionals were, and that there was limited time and a lack of reimbursement pathways for Practice Analytics. One interviewee was concerned about inaccuracies in the EHD currently being collected, which may result in health professionals getting an incomplete clinical narrative if using it for practice reflection. Another interviewee was also worried that Practice Analytics may lead to caseload gaming which may mean health professionals were less willing to take on difficult patients as this would be negatively reflected in the EHD.

*That's a very vexed one which is, it's a real problem... For instance, if you're a surgeon specialising in an operation, which can have a reasonable mortality rate, and if you're going to be judged on your excellence as a surgeon on your mortality rate, you're probably less likely to accept patients who might be in that risk field. You probably send them off somewhere else, or just say, 'Look, I don't think I'll touch you.' Because at the end of the day, you know that you're going to be assessed through the hospital system and people are going to say, 'This person's had a*

*5% fatality rate doing this operation. He can't be any good! When it's just as likely that the people that he's operated on would all have died anyway, plus a few more. – PCP\_02 (74yo, high level of health service interaction).*

### **Expectations around consent to use electronic health data for health professional learning**

All interviewees were asked to reflect on their expectations about consent for secondary use of EHD, particularly in the context of reflective practice. Interviewees had very mixed responses about consent in this context. Most interviewees wanted to know how their specific data was being used but were pragmatic that it may be challenging to do in practice and was not necessarily essential. The majority of interviewees felt consent should act differently to access identified data as opposed to accessing de-identified data. One participant stated:

*It's a learning tool for the health practitioner. I get a lot out of it too... The issue for me is around informed consent. Yeah, informed consent, full stop, and most of it being de-identified... I think I would like to see some informed consent around that. I think that would be ideal.- PCP\_05 (69yo, high level of health service interaction).*

Some interviewees felt very strongly that in an increasingly digitized system, there was really no reason tick boxes could not be added to current forms in order to get consent for secondary uses, but others were concerned this would act as a barrier to use, particularly for something as routine as using EHD for learning.

### **Discussion**

This study sought to explore how consumers felt about Practice Analytics. Although no participants suggested EHD be used in this manner when asked to spontaneously describe secondary use cases, participants unanimously felt it was beneficial for the professional development and growth of their health professionals. This finding generally aligns with the broader literature that most individuals are supportive of health data being used for social benefit [16, 17]. Study findings further suggest consumers are aware of a number of challenges and enablers for harnessing EHD to support professional learning. Finally, regarding participant knowledge of professional learning and registration, findings suggest individuals are generally aware that health professionals undertake different types of educational activities to maintain their registration and stay up to date on best evidence. This may reflect the fact that the majority of

participants are well informed about healthcare in Australia from their personal and professional experiences.

Findings indicate consumers foresaw a range of challenges about health professionals using EHD to support learning. A notable challenge was a perception that health professionals were time poor and that Practice analytics had the potential to increase workloads. Whilst participants expressed there was considerable value in using data for learning and reflective practice, it was conveyed that health professionals needed support to use data this way. This aligns with literature already undertaken in the space of Practice Analytics which has shown that the presentation of data for understanding performance is a key enabler for supporting its secondary use for learning, as are opportunities for facilitated coaching [5]. Consumers identified different enablers than those in the literature to date such as funding mechanisms to acknowledge time spent on learning. Although this is a new factor identified as an enabler of health professional engagement with Practice Analytics, the need for mechanisms to record time health professionals spend engaging in data review need to be better supported in visualisation tools for CPD (as opposed to financial reimbursement) has been noted in the existing literature [5]. Consumers also identified a need for CISs' to be designed in a way to scaffold data to highlight learning opportunities, a gap that has also been noted in the literature [25].

Finally, findings suggest consumers have nuanced views on consent. Most participants felt it wasn't essential for consent to be obtained for Practice Analytics, but it was clear most individuals were keen to have some form of feedback loop to know if their data was being used that way. One solution to supporting varied expectations from consumers about consent is Dynamic Consent, the use of online platforms to facilitate consent and provide ongoing communication between researchers and participants about how their data is being used [26]. Expansion of Dynamic Consent for secondary use of data for applications other than research could allow consumers more visibility of how health professionals are utilising their data in a range of contexts. Increased visibility of how health data is being used may also increase likelihood of consumers consenting for a breadth of applications, as the literature has repeatedly shown that trust and transparency are factors that motivate individuals to share their EHD [16]. Relatedly, there is considerable trust that individual health professionals will use EHD responsibly regardless of the secondary use [16]. However, findings from this study suggest that individuals are less comfortable with their EHD being used for reflective practice when the health professional is not involved in their care. This is a potential challenge as reflecting on EHD as a multi or transdisciplinary team is not uncommon for health professionals and group reflection has

been identified as a key factor for enabling health professionals to engage in Practice Analytics [5]. Given the perspectives of consumers on this topic one solution may be to improve transparency around secondary use of EHD for Practice Analytics, which would also align with findings from this study that at least some consumers would like more of a closed loop about when and how health professionals are engaging with EHD to support reflective practice more broadly.

### Limitations and further research

A limitation of this study is that the sample could be considered small relative to the Australian population, which may limit the generalisability of the findings. Although saturation was reached, the findings reflect the experiences of Australian residents with a high level of interaction with the health system and general health literacy. This may influence their perspectives about the importance of professional development for health professionals, and the value they place on their personal data. Further researchers should consider exploring the perspectives of individuals from different demographics including younger Australian residents, and individuals with lower levels of health literacy.

### Conclusions

Australians are becoming increasingly aware of the large amount of EHD that is collected about their health, and the ways it could be used beyond care delivery. Although the use of these data by health professionals to engage in reflective practice and support professional learning is not front of mind as a secondary use for consumers, they are broadly supportive of data being used this way when asked about it directly. Consumers also see many challenges that need to be overcome for this secondary use of EHD, including the limited time health professionals have in their workloads to engage in these activities; concerns around consent, particularly when it is used by teams who may not have provided care to the patient whose data is being reviewed; inaccuracies or gaps in the data; and a potential for caseload gaming resulting in health professionals avoiding treating complex patients. Participants suggest the development of guidelines, and revisions to current funding models and CISs as ways of addressing some of these concerns.

### Abbreviations

EHD Electronic Health Data  
CIS Clinical Information Systems

### Supplementary Information

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Supplementary Material 1

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### Author contributions

AJ developed the study methodology with input from KS, MK and TS. AJ conducted the interviews. AJ and KS completed the interview analysis. AJ drafted the manuscript with contributions and review from KS, MK and TS. AJ is the guarantor of this work and the conduct of this study, had access to the data, and controlled the decision to publish.

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### Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

### Declarations

#### Ethical considerations and consent to participate

Human Research ethics approval was obtained from The University of Sydney Human Research Ethics Committee [Protocol: 2020/773]. All participants provided written informed consent before agreeing to participate in the study.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare no competing interests.

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