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# General practitioner perceptions of assessment and reporting of absolute cardiovascular disease risk via pathology services: a qualitative study

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## Abstract

**Background**: Guidelines for cardiovascular disease (CVD) prevention recommend assessment of absolute CVD risk to guide clinical management. Despite this, use among general practitioners (GPs) remains limited.

**Objective**: Pathology services may provide an appropriate setting to assess and report absolute CVD risk in patients attending for cholesterol measurement. This study aimed to explore GPs perceptions of such a service.

**Methods**: A focus group and semi-structured interviews were conducted with GPs ($n$ = 18) in Tasmania, Australia, to identify perceptions of assessment and reporting of absolute CVD risk via pathology services. An example pathology report including absolute CVD risk was provided and discussed. Audio-recordings were transcribed and thematically coded by two researchers.

**Results**: Almost all GPs identified that absolute CVD risk assessed and reported via pathology services could address deficits in practice. First, by reducing the number of appointments required to collect risk factors. Second, by providing a systematic (rather than opportunistic) approach for assessment of absolute CVD risk. Third, by reducing misclassification of patient CVD risk caused by overreliance on clinical intuition. All GPs reported they would order absolute CVD risk when issuing a cholesterol referral if such a service was offered. GPs recommended improving the service by providing information on methods used to measure risk factors on the pathology report.

**Conclusions**: Absolute CVD risk assessed and reported via pathology services may address challenges of screening CVD risk experienced by GPs in practice and encourage dedicated follow-up care for CVD prevention.

**Key words**: Community medicine, computers in medicine, health promotion, health risk behaviours, population health, screening

## Introduction

Cardiovascular disease (CVD) prevention guidelines recommend the use of absolute CVD risk, based on multiple risk factors, to guide clinical management (1–3). Australian guidelines recommend using a 5-year Framingham risk equation based on age, sex, smoking status, diabetes, systolic blood pressure and cholesterol to predict absolute CVD risk (1,4). Patients with a score >15% are classified as high risk and recommended for simultaneous blood pressure and cholesterol lowering therapy in addition to lifestyle modification (1). Absolute CVD risk management has a favourable risk–benefit ratio for preventing CVD events compared with single risk factor management (5–8). Despite this, there is poor implementation of guidelines,

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**Key Messages**

- Absolute CVD risk via pathology services could address deficits in primary care.
- GPs would order absolute CVD risk alongside cholesterol via pathology services.
- Pathology-reported absolute CVD risk may prompt a dedicated CVD consultation.
- A risk factor measurement protocol should be provided on the pathology report.

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with limited screening of absolute CVD risk and a focus on single risk factor management (e.g. only focussed on lipids or blood pressure), resulting in missed opportunity to effectively manage CVD risk in primary care (9–12).

Previous attempts to improve implementation of absolute CVD risk in Australia focussed on electronic tools, such as CVD risk calculators, integrated with existing medical software and decision aids to support management (13–16). These interventions have had limited success, perhaps due to barriers including lack of time to conduct absolute CVD risk assessment, lack of motivation to engage with absolute CVD risk or lack of knowledge of CVD prevention guidelines (17–19).

Pathology services offer an ideal setting to assess and report absolute CVD risk to address barriers and increase guideline-directed care (20). Referral to pathology services for cholesterol measurement is an essential component of risk factor collection for absolute CVD risk assessment and accounts for approximately 6% of all general practitioner (GP) pathology requests (21). This patient cohort offers an opportunity to integrate absolute CVD risk assessment and reporting to GPs via pathology services and value-add to routine care. This study aimed to explore GP perceptions of such a service in the context of current challenges in screening and management of CVD risk.

## Methods

### Study protocol

This was a qualitative study to determine GP attitudes to absolute CVD risk assessment and reporting via pathology services. Currently, practising GPs (*n* = 18) participated either in a focus group (*n* = 8) or semi-structured interview (*n* = 10). First, a questionnaire was delivered to determine demographic information and CVD risk management used in practice. Next, GPs were interviewed about current CVD risk screening and management practice. Lastly, GPs were advised on how absolute CVD risk would be assessed and reported via pathology services and shown an example pathology report with hypothetical absolute CVD risk information to discuss (Fig. 1). The focus group and interviews lasted between 18 and 39 minutes, were conducted in person, audio recorded, transcribed verbatim and independently coded by two researchers. Participants provided written informed consent and the research was undertaken in accordance with ethical approval [H0015648].

### Participant recruitment

Focus group participants were recruited from a local practice as a convenience sample to pilot interview questions. Focus group discussion was used to pilot the discussion guide as this format was likely to result in different opinions and/or follow-up questions among colleagues that could inform future probing questions for interviews. Interview participants were purposively sampled to include practices from North and South Tasmania and diversity of characteristics known to influence CVD risk management including gender, age and years of practice (22–24). Invitations to participate were sent to Practice Managers in each locality to disseminate to GPs between June and December 2018. GPs received a $150 gift card for their time. Recruitment was conducted until data saturation had been reached (25).

### Data collection

A semi-structured interview guide was developed by the research team covering: (i) current practice for CVD risk assessment and management; (ii) barriers to CVD risk assessment in practice and (iii) attitudes towards absolute CVD risk assessment and reporting via pathology services (see S1_Discussion Guide). First, participants completed a questionnaire to collect gender, age range, years of practice experience and use of individual risk factor and absolute CVD risk management in practice. Once the survey was completed, interviews commenced with questions focussed on current practice and barriers for CVD risk assessment and management. Lastly, GPs were shown an example pathology report (Fig. 1) illustrating how absolute CVD risk information assessed and reported via pathology services would be presented.

GPs were advised that the service would work as follows: (i) patients aged 45–74 years referred to pathology services for cholesterol measurement would be eligible for absolute CVD risk assessment via a computer-based app; (ii) the app would measure risk factors such as smoking status, diabetes status and blood pressure via a validated cuff-based device; (iii) risk factor data would be sent to the pathology laboratory, matched with the patient's cholesterol result and used to estimate absolute CVD risk; (iv) risk factors, absolute CVD risk score, category and guideline-directed treatment recommendations would be reported alongside the requested results as shown in Figure 1 (26). GPs were then asked questions to ascertain attitudes towards absolute CVD risk assessed and reported via pathology services and hypothetical management responses to receiving such a report.

### Data analysis

Data were thematically analysed by two researchers (NC and RM) using line-by-line coding. Data were organized into themes based on the framework analysis method (27,28): (i) a thematic framework was developed by independently identifying and discussing themes in the focus group transcript as a subset of the data; (ii) the thematic framework was independently applied to two interview transcripts with further discussion and revision by comparing quotes categorized into themes; (iii) remaining transcripts were analysed according to the framework with constant comparison and (iv) themes were reviewed by and discussed with a third investigator (JS). Data were organized, grouped and annotated in the qualitative data management tool NVivo 10 (QSR International).

## Results

### Participants characteristics

GP characteristics are presented in Table 1. According to survey responses, individual risk factors were used most often (67%) for

**Figure 1.** Example pathology report with hypothetical risk factor and absolute CVD risk information used as a discussion aid with GPs.

CVD risk management in daily practice. Absolute CVD risk management was used almost always or most often in daily practice among 28% and 33% of GPs, respectively. Most GPs reported that it was extremely likely (56%) or fairly likely (28%) they would use absolute CVD risk reported via pathology services to manage patients.

### Absolute CVD risk assessment themes

Three themes were identified: (i) barriers to screening CVD risk; (ii) barriers to management of CVD risk and (iii) patient-centred practice for CVD prevention. These themes are discussed in the context of perceptions towards absolute CVD risk assessment and reporting via pathology services. Table 2 provides a summary of the themes discussed with quotations to illustrate the data.

### (1) Barriers to screening CVD risk

Eighty percent of GPs reported screening was undertaken opportunistically to value-add at the end of consultations if time permitted. For example, GP9 '*It's a bit random, because it depends what the patient has come in for, but I do opportunistic screening*'. GPs typically conducted CVD risk assessment with new patients over several visits and after rapport had been established. Only one GP reported patients were proactively invited for preventive screening where CVD risk factors would be measured and absolute CVD risk assessed. Clinical intuition was the main tool for determining cardiovascular risk for many GPs, either based on 'gut instinct' or an estimate of the absolute CVD risk score based on experience rather than using the calculator. For example, GP3 '*you look at them and go "you are high risk", like there's just something about you that makes me feel like you're at high risk*'. Barriers to screening included: lack of time;

an opportunistic approach when the patient attended for something else; the need for several consultations to collect risk factors and misclassification of patient CVD risk by clinical intuition.

Almost all GPs identified ways absolute CVD risk assessment via pathology services could alleviate deficits in practice by providing a systematic (rather than opportunistic) mechanism for CVD risk screening, reducing the number of appointments required to collect risk factors and reducing misclassification of patients caused by overreliance on clinical intuition. As said by GP5 '*It would be easier if, with this sort of calculation if it could be done before […] then you can really work on the management side of things*'. When asked specifically, all GPs reported they would order absolute CVD risk when issuing a cholesterol referral if such a service was offered.

There was discrepancy regarding the utility of existing absolute CVD risk assessment software. Several GPs rarely used it or use was inconsistent as it required an extra step to proceed to the absolute CVD risk tool within the GP management software, even when data imported automatically. Deficiencies in the current absolute CVD risk assessment model raised concerns for GPs, which engendered a lack of trust. Specifically, family history contributed greatly to clinical decision making and risk classification with many reporting they would adjust risk upwards or 'give extra points' for family history. Chronic kidney disease was an important risk factor; most GPs expressed confusion over current guidelines, while others reported it should be formally included in the risk estimation model. Additionally, several GPs said ethnicity—especially Aboriginal and Torres Strait Islander status—was not adequately considered in the current tools. The use of left ventricular hypertrophy by electrocardiography in the absolute CVD risk assessment model was described as 'pointless' by many GPs.

**Table 1.** GPs interviewee characteristics and cardiovascular risk assessment practices (*n* = 18)

| Variable | *n* (%) |
| --- | --- |
| Female | 9 (50) |
| Age range (*n* = 10) | |
| <40 years | 4 (40) |
| 40–49 years | 2 (20) |
| 50–59 years | 2 (20) |
| >60 years | 2 (20) |
| Years of practice (*n* = 10) | |
| <5 years | 2 (20) |
| 5–9 years | 4 (40) |
| 10–19 years | 2 (20) |
| >20–29 years | 2 (20) |
| Patient management according to individual risk factors in daily practice | |
| Almost always | 0 |
| Most often | 12 (67) |
| Occasionally | 4 (22) |
| Rarely | 2 (11) |
| Never | 0 |
| Patient management according to absolute CVD risk in daily practice | |
| Almost always | 5 (28) |
| Most often | 6 (33) |
| Occasionally | 5 (28) |
| Rarely | 2 (11) |
| Never | 0 |
| Likelihood of using absolute cardiovascular risk information assessed and reported from pathology services in clinical management of patients | |
| Extremely | 10 (56) |
| Fairly | 6 (28) |
| Somewhat | 3 (17) |
| Not very | 0 |
| Not at all | 0 |

## (2) Barriers to management of CVD risk

GPs reported absolute CVD risk was used most often as a communication tool to motivate patients rather than to guide clinical management. When shown a sample pathology report, GPs commented that high absolute CVD risk, highlighted in red, reported via pathology services would prompt a dedicated session for CVD prevention, even if the requested cholesterol was normal. As said by GP6 '*I'd bring them back for a specific consult to discuss cardiovascular risk. Because it's red and it's highlighted*'. All GPs reported guideline-directed treatment recommendations on the report were useful.

Self-reported risk factors such as smoking and diabetes status were viewed as useful to confirm or challenge records and initiate discussion with patients. All GPs reported that the blood pressure measurement provided would be a useful trigger for discussion, but many would repeat the measurement. After explanation of the blood pressure measurement protocol, GPs considered it a worthwhile, value-adding service and suggested that protocol information be provided on the pathology report to inform GPs.

In relation to management strategies, there was a tendency towards addressing single risk factors rather than treating according to absolute CVD risk. All GPs indicated they would start with blood pressure lowering therapy. Several cited patient factors for this approach including avoiding adverse side-effects, increasing compliance with therapy recommendations and that patients were typically more receptive to blood pressure lowering medications than statins. GPs attributed statin reluctance to the effect of an Australian

Broadcasting Corporation documentary on patient attitudes (*Heart of the Matter*, aired October 2013) (29). GPs emphasized that lifestyle modification could achieve substantial reduction in CVD risk, but most expressed a belief that inevitably high-risk patients would end up on medications.

## (3) Patient-centred practice for CVD prevention

GPs recognized the importance of patient preferences, motivation and comprehension in their practice, and adapted their care to individual patients. Many GPs were concerned about changes in GP–patient relationships, and a decline in GPs as the 'family doctor' with long-standing relationships with the patient and their family. A shortage of GPs, GPs working part-time and patients visiting multiple GPs rather than one regular GP were all viewed as detrimental to building rapport with patients that is essential for preventive medicine. This posed a challenge for responding effectively to the absolute CVD risk reported by pathology services for two reasons: the patient may wish to discuss the results with a specific doctor; or the GP may not feel there is sufficient rapport to implement a prevention strategy.

GPs reported using absolute CVD risk tools predominantly for risk communication: for populations with low health literacy, to motivate high-risk patients, or increase patient self-efficacy by demonstrating how changing risk factors modifies CVD risk. Most GPs reported that a pathology report containing absolute CVD risk results would strengthen this approach, observing that the report would be a useful discussion piece and provide something tangible for the patient to take away. For example, GP3 '*I'd prefer this as a patient, having something I can actually see. [...] because there's so much that goes on in that 15 minutes, they can sometimes walk out and go "I don't know what she talked about"*'. Additionally, patient complacency towards preventive medicine was highlighted as a concern that may be ameliorated by a high result from pathology services, reinforcing CVD risk as an objective result from a reputable third party.

## Discussion

This study identified that absolute CVD risk assessment via pathology services may address barriers in practice by: providing a systematic approach to assessment; reducing the number of clinical consultations required to collect risk factors, and reducing risk misclassification by clinical intuition. Additionally, GPs commented that high absolute CVD risk reported via pathology services would prompt a dedicated consultation for CVD prevention that may otherwise not occur. GPs identified risk factor assessment methods at pathology services should be reported alongside test results to inform GPs and aid uptake of such a service. Altogether, these findings suggest absolute CVD risk assessed and reported via pathology services may address barriers and support guideline-directed care in primary practice.

In Australia, 20% of adults aged 45–74 years are at high risk according to absolute CVD risk assessment and 75% are not receiving recommended prevention therapy (30). As highlighted in this study, there are many challenges to absolute CVD risk assessment in practice. Risk factor collection requires multiple clinical consultations. GPs implement an opportunistic approach at the end of consultations if time permits, undoubtedly challenging to achieve in a busy primary care environment. Additionally, use of electronic tools for absolute CVD risk assessment is low. Subsequently, GPs defer to

**Table 2.** Summary of themes and illustrative quotations related to GPs' current practice for the assessment and management of cardiovascular risk and attitudes towards automated absolute CVD risk assessment and reporting via pathology services

| Theme | Illustrative quote (gender, age range, years of practice experience) |
|---|---|
| Screening for cardiovascular risk | |
| Opportunistic | 'It's a bit random, because it depends what the patient has come in for, but I do opportunistic screening. So, if there's a short consultation about something or other that's of not much value, I will value add and say let's have a look at some of your other health risks. So, we automatically start, the system flags us to put in smoking history in, but we don't always put it in. But, so I will randomly screen.' (GP9, male, >60 years of age, 20–29 years practice experience) |
| | 'The main impediment is me just not thinking about it in everybody. Because I'm doing other stuff with them, so, that kind of comes as a fourth or fifth problem, I may or may not think about it on the day.' (GP4, male, aged >60 years, >30 years practice experience) |
| Clinical intuition | 'I guess sometimes you see the patient, and you look at them and go "you are high risk", like there's just something about you that makes me feel like you're at high risk. This calculator might, I don't know, tell me that you're not. But I still want to treat that. Because in my gut, I don't know, that little medical instinct is saying "you're going to have an event".' (GP3, female, aged <40 years, 5 years practice experience) |
| | 'There are a significant number of people, who I glance at their cholesterol, and if I don't happen to put it into the machine, and work out, you guess wrong. I mean, there's no doubt about it. But the risk calculator gives you surprises, because the HDL's a little low, the LDL's a little low, the total's a little high. You think oh yeah close enough. But when you put it into the machine, out comes this number saying 15 percent risk or something. And you think I'd have never guessed that.' (GP4, male, aged >60 years, >30 years practice experience) |
| Absolute CVD risk software and improvement | 'our software has got calculators in there, but I'd be surprised if many practices use them. Because once you've been at it for a while, its intuitive. You can just weigh it up in your head, roughly.' (GP8, male, 50–59 years of age, 5–9 years practice experience) |
| | 'I actually must admit I'm pretty inconsistent with the use [of the absolute CVD risk software]. I use it when I think it's going to be useful. So, yeah, we've talked about this in the practice from time to time, and I think it's use varies with how long it is since we've had some service on it, or stuff like that.' (GP8, male, 50–59 years of age, 5–9 years practice experience) |
| | 'I guess, the calculators as well. I don't know how much trust I have in their ability to really assess the risk and take all those risk factors in. I mean the one I use on Best Practice doesn't even take family history, or BMI, or that sort of thing and ethnicity isn't included. And I always think that that's quite a big risk.' (GP3, female, aged <40 years, 5 years practice experience) |
| Automated assessment of CVD | 'To have it all done, every time, automatically, would be a great reminder for me to say, well somebody who you thought was ok, because you didn't put it the numbers into [the calculator] because you just glanced at it. This would be great.' (GP4, male, aged >60 years, >30 years practice experience) |
| | 'It would be easier if, with this sort of calculation if it could be done before, then they come in and it spits out a number, and then you can really work on the management side of things. As opposed to having to gather all the data in four consultations, where you might actually lose patients along the way, because they kind of get sick of coming back to you and lose motivation.' 'this stuff I am ordering, and I am doing every day on patients, so, this stuff I would be happy to receive because it just makes my life easier. And for some patients it might just be having a look and seeing the high there is enough to make them stop smoking.' (GP5, female, aged <40 years, 5–9 years practice experience) |
| | 'you know, sometimes people don't want to tell you about their smoking, or whatever else because they're worried that you'll judge them or lecture them about smoking because that's the classic line. So, maybe if its in a space where it's neutral […] So, it's like "I know that you smoke" or "you told someone else that you smoke", but my records say that "you're an ex-smoker. Tell me about this".' (GP1, female, age <40 years, <5 years practice experience) |
| Management of cardiovascular risk and response to absolute CVD risk in pathology results | |
| Recall | 'Often I don't have time to ask these questions, but if I saw a red "high" risk, I'd definitely bring that back and talk to the patient about it. So, yes it would change my practice. I'd bring them back for a specific consult to discuss cardiovascular risk. Because it's red and it's highlighted, and say "look, you're high risk", it just saves us a step.' (GP6, female, <40 years of age, <10 years practice experience) |
| Urgency | 'I mean if I saw that [absolute CVD risk score] coming in as high then I would tick that as a return urgent, which just means the girls would ring them in the next day or two, and that we want to see you in the next couple of weeks. We just like to say "recall, doctor wants to see you in the next fortnight". Whereas on that one [cholesterol result] I probably wouldn't do that.' (GP7, female, 50–59 years of age, 10–19 years practice experience) |
| Treatment | 'It guides my treatment, but in terms of being the whole sole focus of whether to start a medication or not, I guess for high cholesterol it's something that's a bit more specific. Hypertension, it's something that's a little more variable, and I like to keep an eye on over time. But, having said that, cholesterol levels can drop quite a bit as well with some dietary and lifestyle modifications. So, yeah, it definitely, I use it as a guide, but I don't use it as a strict indicator in thinking I'm going to start this person on this medication now, straight away.' (GP2, male, 40–49 years of age, 5–9 years practice experience) |
| | 'I know we can use this, and it's easy for our work, apart from explaining long term things and a patient will be aware, then it's easy to initiate cholesterol medication and stuff.' (GP10, male, 40–49 years of age, 10–19 years practice experience) |

**Table 2.** Continued

| Theme | Illustrative quote (gender, age range, years of practice experience) |
| --- | --- |
| Patient-centred practice in the context of CVD prevention and management | |
| Patient understanding | 'I don't find that patients understand numbers that well. So, you know, I often say in five years you've got this chance of having a cardiovascular event, but that's very easy to brush off. So, sometimes I use, there's a website with the little smiley faces, and then the sad faces if there's a risk. And like, maybe some kind of visual representation is a little bit better. But I still don't always feel like they grasp the risk that they're at, and how they could modify it as well.' (GP3, female, aged <40 years, 5 years practice experience) |
| | 'I'd prefer this as a patient, having something I can actually see. And it allows them to walk out of the room with something that they can hold onto, because there's so much that goes on in that 15 minutes, they can sometimes walk out and go "I don't know what she talked about, and now I've got these medications, and I don't really know what to do with it. Why am I taking them again? I don't want to do it, and I'm not going to go and see her". But if they went out with that [blood test report], they'd be like "oh yeah, that's right. I think I will take my medication, maybe I will go back and see her".' (GP5, female, aged <40 years, 5–9 years practice experience) |
| | 'the nice thing about the calculator is that I can fiddle with the numbers. I can go "look this is what happens if I bring your blood pressure down, this is what happens if I bring your cholesterol down", and you can see the change in the risk. "This is what happens if you stop smoking, you know if we get your diabetes under control". And so that's, I find that really useful with people. Because they can kind of go "oh, ok, yeah I can see I halve my risk by stopping smoking. Well that's a simple thing to do, let's give that a crack". Rather than take a statin or something.' (GP8, male, 50–59 years of age, 5–9 years practice experience) |
| Family practice | 'plus knowing their family. As a general practitioner I like the idea of knowing the whole family. If you know grandma or grandpa has just had a heart attack then you'd think about looking into the grandkids.' (GP6, female, <40 years of age, <10 years practice experience) |

using clinical intuition, rather than validated, evidence-based tools to estimate CVD risk. Indeed, previous interventions to increase absolute CVD risk assessment using electronic tools have had limited success (13–16). Thus, alternative solutions, such as that presented in this study, are needed to embed absolute CVD risk into existing care delivery.

GPs highlighted the aforementioned challenges would likely be addressed by assessing and reporting absolute CVD risk via pathology services. Previous work highlighted that this referral point is an opportune setting to embed absolute CVD risk assessment (20). The assessment of absolute CVD risk at pathology services builds on these findings, as patients undertake a self-directed risk factor assessment rather than relying on GPs to provide this information at the time of referral for cholesterol measurement. Subsequently, absolute CVD risk assessed and reported via pathology services provides a standardized and systematic approach, rather than relying on fragmented opportunities within a busy clinical environment and clinical intuition. Secondly, as highlighted in previous work, GPs support patient self-assessment either independently or assisted by practice staff to alleviate time and resource constraints as barriers to absolute CVD risk assessment (31). Absolute CVD risk assessed and reported via pathology services provides such a service. Moreover, such a service could reduce the number of appointments required to collect risk factors, with the potential to reduce burden for patients and GPs. To facilitate uptake of a new service it must be acceptable to all relevant parties including GPs and patients. Previous work demonstrated that absolute CVD risk assessment via pathology services was acceptable to patients (26).

When shown an example pathology report with absolute CVD risk factors, score, category and guideline-directed treatment recommendations, GPs advised a high-risk result would prompt a dedicated session to CVD prevention which would otherwise not occur. However, in keeping with previous evidence, GPs still preferred a single risk factor management approach (32). Previous work identified barriers to GP use of absolute CVD risk for patient management including: conflicting or complicated guidelines (17), difficulty explaining absolute CVD risk (31), low knowledge of or trust in absolute CVD risk models and that absolute CVD risk is limited due to the risk factors included in the model (33,34). This latter reason contributed to lack of trust in absolute CVD risk assessment among GPs in this current study. Particularly as risk factors that GPs deemed clinically important for CVD, such as family history of CVD, are not included in the absolute CVD risk prediction model. Additionally, GPs lacked knowledge of the benefits of absolute CVD risk compared with individual risk factors management.

Despite focussing on single risk factor management strategies, GPs stated they would request absolute CVD risk assessment when referring patients to pathology services if such a service was available. Furthermore, GPs stated that high absolute CVD risk, highlighted in red on the pathology report, would prompt a follow-up response even if the requested cholesterol result was normal. These findings highlight that several factors influence use of absolute CVD risk among GPs. Previous work identified GP use of absolute CVD risk falls under five key approaches, ranging from a focus on absolute CVD risk as it is deemed useful, to total disregard for absolute CVD risk as it was considered inappropriate (11). To support use of absolute CVD risk reported via pathology services, clear treatment recommendations specific to the patient's absolute CVD risk level need to be provided on the pathology report, rather than treatment advice for all risk categories. Additionally, GPs had concerns regarding the absolute CVD risk factor collection methods, and so providing this information on the pathology report would be essential to inform GPs and develop trust in measurement methods. Further, engagement with GPs as stakeholders of such a service is required to identify information that needs to be included on the pathology report to prompt GPs to act according to absolute CVD risk.

## Strengths and limitations

While the recruitment strategy aimed to include diverse views, the findings may not be generalizable as the sample is limited to GPs in Tasmania and as recruitment was by self-selection there may be selection bias. As standard with qualitative research, recruitment of participants was conducted until data saturation had been reached, and this led to a small sample. Thus, the generalizability of the findings cannot be assured and future research in larger quantitative studies is needed. Self-report may differ from reality in practice and the clinical utility of absolute CVD risk assessment and reporting via pathology services needs to be determined by a randomized control trial. Nevertheless, this work provides critical insight to refine and improve such a service.

## Conclusions

This study identified ways that absolute CVD risk assessed and reported via pathology services may alleviate deficits in practice. Pathology services could embed systematic screening, streamline risk factor collection and embed appropriate CVD risk classification into routine care. Absolute CVD risk reported via pathology services must include education on risk assessment methods to promote uptake of such a service.

## Supplementary material

Supplementary material is available at *Family Practice* online.
Supplement 1. Discussion guide covering cardiovascular disease assessment and prevention practices for interviews with general practitioners.

## Acknowledgements

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