PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Doctors' approaches to PSA testing and overdiagnosis in primary health care: A qualitative study
AUTHORS	Pickles, Kristen; Carter, Stacy; Rychetnik, Lucie

VERSION 1 - REVIEW

REVIEWER	Dr Susmita Chowdhury PHG Foundation UK
REVIEW RETURNED	01-Oct-2014

GENERAL COMMENTS	All comments are in the pdf attachment Detailed comments attached. The paper touches on an important topic. However it can be improved so that the discussion is stronger. It would be good to emphasise on the implications of your results. The English can be improved slightly. Congratulations on looking at a neglected area of concern. Instead of solving each and every individual comment that I made, authors can think about how to improve the paper overall- based on all the reviewers' comments. If the authors feel the reviewer has misunderstood what they are trying to say, then that means that section is not clear enough. The results are good but the writing flow, and discussion could be improved.

- The reviewer also provided a marked copy of the manuscript with further comments. Please contact the BMJ Open Editorial office for further information.

REVIEWER	Deborah Bowen University of Washington usa
REVIEW RETURNED	23-Dec-2014

GENERAL COMMENTS	Table 1 is not necessary. And should be dropped The introduction should spend a bit more time in providing a rationale for the study. How is this different from the cited studies in the intro? None. The manuscript contains valuable information and is clearly written Table 1 is not necessary. And should be dropped The introduction should spend a bit more time in providing a rationale for the study. How is this different from the cited studies in the intro?

	This was a good idea and should see the light of day

VERSION 1 – AUTHOR RESPONSE

REVIEWER #1:

Do make sure all your objectives are touched on in the discussion
We believe the additions we have made to the text in the discussion (see below) meets Reviewer 1 requests to touch on the objectives. We are happy to take further direction from the Editor if required.

Objective: To explain GPs' routine PSA testing practices - Needs rethinking/rephrasing

We have made the following changes to the framing of the objectives:
1. To explain GPs' approaches to PSA testing and overdiagnosis;
2. To explain how GPs reason about their PSA testing routines; and
3. To explain how these routines influence GPs' personal experience as clinicians.

Limitations of the study also need to come into the discussion. What are the weaknesses?

We have added the following limitations to the discussion:
Since physicians with strong opinions may have been more likely to volunteer, some selection bias is possible. However diverse opinions and approaches were reported suggesting strong selection bias is unlikely.

'Most guidelines recommend against population screening (3, 5, 6); some professional societies recommend selective PSA testing (7-9) (Table 1) and many men are tested (10-12), including in the UK where PSA testing for screening purposes is not recommended'. - The second half of this sentence needs to be clearer

This sentence now reads
Most guidelines recommend against population screening for prostate cancer (3, 5, 6) however some professional societies do recommend selective PSA testing (7-9). In Australia, and internationally, many men continue to be tested despite guidelines advising not to screen (10-12).

'This article presents an empirical qualitative study of how Australian General Practitioners (GPs) manage the risk of overdiagnosis of prostate cancer' - Authors need to consider whether this sentences reflects clearly and comprehensively all the objectives (4) mentioned above.

We have revised the objectives (see above) and this sentence, which now reads:
This article presents an empirical qualitative study of how Australian General Practitioners (GPs) reason about PSA testing of asymptomatic men for prostate cancer, who they test and why, with a particular focus on how GPs manage the risk of overdiagnosis.

'The situation is made more complex however, by the fact that PSA testing may decrease the incidence of metastatic prostate cancer (27), and for some men, lower stage and grade of cancer at diagnosis (28-30)' - This sentence is not clear.

This paragraph now reads:
Advocates of testing argue that PSA testing may, in some cases, lower the stage and grade of cancer at diagnosis, and reduce the risk of being diagnosed with metastatic prostate cancer, for which there is no cure (27-29). However across the population of asymptomatic men, PSA testing does not

decrease all-cause mortality, and some men will progress and develop metastatic disease even if they are screened (despite earlier diagnosis) (30).

'Responsibility for guiding men's decisions about whether or not to be screened has largely been placed in the hands of individual physicians' – suggest screened for prostate cancer?

This sentence now reads:
Responsibility for guiding men's decisions about whether to be screened for prostate cancer has largely been placed in the hands of individual physicians.

'Empirical work exploring prostate cancer screening in general practice has primarily focused on why GPs are ordering PSA tests (31-37), characteristics associated with more and less testing (31, 35, 38, 39), and what GPs are including in discussions with men about the test' - The English of the sentence can be improved

This sentence now reads:
Empirical work exploring prostate cancer screening in general practice has primarily focused on: 1) the reasons GPs give for ordering PSA tests; 2) the characteristics of GPs (such as age, gender, location) associated with more or less frequent testing; and 3) how GPs communicate with patients about the PSA test (31-39)

Examples of questions GPs were asked about overdiagnosis included:
• Are you familiar with the term 'overdiagnosis'?
• Do you think about the issue of overdiagnosis in your practice?
• How do you manage overdiagnosis in your practice?
• Overdiagnosis must be a challenging concept to talk about with your patients, how do you manage that challenge?
None of the questions are stated to be related to PSA.

The interviewer was very clear with GPs that the primary focus of the interviews was PSA testing of asymptomatic men in general practice, and that all questions asked would be in relation to that topic. These questions were asked approximately half way through an interview which had been entirely focused on PSA testing, so it was clear to the interviewee that the questions were all in relation to PSA testing in particular.

'Most GPs struggled with PSA testing' - struggled in what sense?

We have added to the sentence:
Most GPs felt uncertain and/or conflicted regarding what to do about PSA testing of asymptomatic men.

'We will explain overall patterns and then outline four heuristics' – Suggest In the following section..

Added.
In the following section we will explain overall patterns and then outline four heuristics.

1. 'Overdiagnosis is hard to understand' - for whom?

Overdiagnosis is hard to understand for GPs and for the public – and it is contradictory to many people's existing health beliefs

2. 'Doctors and patients can be enthusiastic about cancer screening' - what is meant by 'enthusiastic'?

any better word/description?

Both doctors and patients often have a strong belief that cancer screening is, in general, a worthwhile and important strategy to combat the risk of getting cancer.

3. ‘Cancer is widely feared and difficult to talk about’ - no. 2 and no. 3 points seem contradictory. But perhaps slightly more explanation will suffice.

This point is now no.1. followed by points 2 and 3 to make the flow of the statements clear

Four broad patterns (‘heuristics’) were employed:
1. GPs preferred to avoid underdiagnosis: that is, they prioritised preventing cancer deaths over minimising overdiagnosis
2. GPs were strongly oriented to avoiding overdiagnosis, and so tried to test as little as possible
3. GPs made case-by-case individualised decisions
4. GPs did not think about under or overdiagnosis at all.
Do you mean some GPs or all GPs?

Four broad patterns (‘heuristics’) were employed:
1. Some GPs preferred to avoid underdiagnosis: that is, they prioritised preventing cancer deaths over
minimising overdiagnosis
2. Some GPs were strongly oriented to avoiding overdiagnosis, and so tried to test as little as possible
3. Some GPs made case-by-case individualised decisions
4. Some GPs did not think about under or overdiagnosis at all.

‘GPs not thinking about under or overdiagnosis did not have a preference or priority for avoiding one harm over another. For these GPs the PSA test was considered just another form of routine screening and overdiagnosis was not an issue of concern’.
What about underdiagnosis?

GPs not thinking about under or overdiagnosis did not have a preference or priority for avoiding one harm over another. For these GPs the PSA test was considered just another form of routine screening and under or overdiagnosis was not an issue of concern’

Heuristic 4 Paragraph 2
Need to clarify how this section is different from section on Heuristic 2.

As explained in the text, these heuristics were strikingly different. GPs employing Heuristic 2 tried to test as little as possible, because they were very concerned about the potential to cause harm through overdiagnosis. In contrast, GPs employing Heuristic 4 did not really think about under or overdiagnosis at all: they simply tested because that was their habit, and/or because they thought that was what patients expected of them. If the Editor finds the difference between these sections unclear, we are happy to take direction on how to clarify further.

Discussion and conclusion need strengthening

Please refer to the changes outlined below. We are happy to take further direction from the Editor if required.

‘Overdiagnosis is now recognised as a significant problem, but solutions to this problem are as yet uncertain, including in primary care.’…of what due to what...a little introductory sentence

needed..Solutions like?

Overdiagnosis of indolent cancers in cancer screening is now recognised as a significant problem, but solutions to this problem (e.g. communication, public awareness) are as yet uncertain, including in primary care.

Most previous research has examined which GP characteristics are associated with frequent or infrequent testing.
Sentence construction can be improved

Most previous research has examined associations between GP characteristics and frequency of PSA testing.

Discussion Paragraph 1
The first part of this para does not mention PSA testing etc...until the very end.. so the sentences need to be a bit more leading...though we can guess what the author means

Overdiagnosis of indolent cancers in cancer screening is now recognised as a significant problem, but solutions to this problem (e.g. communication, public awareness) are as yet uncertain, including in primary care. Most previous research has examined associations between GP characteristics and frequency of PSA testing. Fewer studies have sought to explain variation in GPs' PSA testing practices.

'Our study provides a more nuanced analysis of how and why GPs test the way they do, and offers a unique examination of GPs' approaches to prostate cancer overdiagnosis'
again...only overdiagnosis...

Our study provides a more nuanced analysis of how and why GPs test the way they do, and offers a unique examination of GPs' approaches to prostate cancer under and overdiagnosis'

It is the first study to systematically map PSA testing with GPs reasoning, revealing four distinct approaches, each associated with different practices, rationales, and outcomes.
Maps GP reasoning for PSA testing or other way around?

It is the first study to systematically examine the relationship between GPs reasoning and behaviour in relation to PSA testing.

It is the first study to systematically map PSA testing with GPs reasoning, revealing four distinct approaches, each of which produce different practices, rationales, and outcomes.
'produce ' may not be the appropriate wording...as rationale is not 'produced from these approaches'

It is the first study to systematically examine the relationship between GPs reasoning and behaviour in relation to PSA testing. We identified four distinct approaches, each associated with different practices, rationales, and outcomes.

There is value in understanding
Add: the reasoning behind

There is value in understanding the reasoning behind actual practice.

There is value in understanding actual practice and why guidance (as it stands) is not producing consistent practice.

define consistent in this case...

There is value in understanding the reasoning behind actual practice. GPs' reasoning makes sense of variation in practice: it explains why different GPs are making different testing decisions in similar cases.

P15 line 29-47:
This section/para can be rewritten with better English and better explanation

We are happy to rework this paragraph if the Editor has any particular concerns.

'Guidance to GPs about PSA testing varies widely'.
What is the guidance used by the GPs here? Are the GPs following different guidance or their 'medical school guidance' as stated in the table? If they are following a clear single guidance for their country, they should be all doing the same thing...why are they doing different things? Lack of proper guidance? what is the specific lacking in the guidance? This section (discussion) needs more clarification and flow

These questions are at the heart of our analysis. We have presented four heuristics that explain why GP practice is not in line with guidelines. We explicitly demonstrate in the introduction, and in Table 1, that guidance on PSA testing is mixed and confusing. And in Table 2 there is a row, headed Did GPs draw on practice guidelines, recommendations, or their interpretation of the evidence? which clearly sets out how use of existing guidelines varies between the four heuristics. We believe the questions raised in this comment have been addressed in the manuscript. However we are happy to make further changes if the Editor thinks they are required.

'This also contributes to the diversity of practice revealed in this study'.
Should a more specific guidance help solve the problem? it appears GPs are free to follow or not follow the guidance and are led by experience etc...how to solve it then?

We have added the following sentence:
Although it would be unrealistic to expect the mere existence of a guideline to change practice (36) it does seem reasonable for GPs to expect that expert bodies will provide clear guidance wherever possible.

The Australian Medical Health and Research Council (NHMRC) has recently produced an authoritative summary of PSA testing benefits and harms for GPs to discuss with their patients; further guidelines are under development.
Standardised/universal guidance?

This is not universal guidance. As stated in the text, it is a summary of the evidence.

The findings of this study offer important guidance for the development of such recommendations.
So in summary what is your recommendation/guidance?

The findings of this study offer important guidance for the implementation of such recommendations into practice. We recommend agencies seeking to promote the uptake of guidance for practitioners must take account of the different motivations of GPs and recognise the significant diversity in the approaches that GPs are taking towards PSA testing of asymptomatic men. GPs who employ Heuristic 2, for example, were already attentive to the epidemiological evidence, and so are likely to be receptive to recent NHMRC guidance. However GPs who are employing Heuristic 1 may need very active knowledge translation strategies if they are to change their practice. These GPs were

deeply concerned that by their failure to screen they might allow a man to die of prostate cancer. It seems unlikely that they will change their practice unless this concern is recognised and responded to. Communications, workshops, and new incentives therefore need to consider variation in GP perspectives and the range of drivers of current practice as identified in this research (address legal concerns, the need for consent due to potential harms, and acknowledge burden).

A respectful understanding of how GPs approach PSA testing,
How do the authors mean 'respectful'?

We are happy to clarify this if the Editor wishes.

and the reasons they give for their actions, should underpin future strategies
how---? should be explained in clearly in the discussion

Please refer to the addition above.

REVIEWER #2:

Table 1 is not necessary. And should be dropped

We are happy to remove Table 1 if that is the Editor's preference. However we do think the Table makes an important point about the extensive variation in guidance internationally, including in the setting of the study.

The introduction should spend a bit more time in providing a rationale for the study. How is this different from the cited studies in the intro?

Mindful of the word limit, we have not added content, but we have clarified the unique contribution of our work in response to Reviewer 1 (below).
p6 beginning line 6 now reads as follows:
Empirical work exploring prostate cancer screening in general practice has primarily focused on: 1) the reasons GPs give for ordering PSA tests; 2) the characteristics of GPs (such as age, gender, location) associated with more or less frequent testing; and 3) how GPs communicate with patients about the PSA test (31-39) The predominantly quantitative evidence provides insights into the patterns and potential drivers of PSA testing in general practice but does not illuminate the dilemmas of PSA testing from the GP's perspective, and in particular how GPs reason about overdiagnosis. To fill this gap, we conducted a qualitative study to explore how and why GPs provide (or don't provide) PSA testing to their asymptomatic male patients. We report on the significance and impact of overdiagnosis in GPs clinical reasoning about PSA testing.

VERSION 2 – REVIEW

REVIEWER	Dr Susmita Chowdhury PHG Foundation, UK
REVIEW RETURNED	06-Feb-2015

- The reviewer completed the checklist but made no further comments