Author's response to reviews

Title: Colorectal cancer screening knowledge, attitudes and behavioural intention in Indigenous Western Australians

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Author's response to reviews: see over
24 February 2012

Editor-in-Chief
BMC Public Health

Dear Editor,

Please find enclosed the revised manuscript entitled, ‘Colorectal cancer screening knowledge, attitudes and behavioural intention among Indigenous Western Australians’ submitted to BMC Public Health for publication as an original research article.

Thank you for reviewing our manuscript and considering it for publication. We appreciate the feedback and suggestions made, and have addressed both reviewers’ comments below. We sincerely apologise for the substantial delay in returning the revisions to you. All suggestions have been addressed apart from the issues raised around our logistic regression analysis as we have encountered delays in getting the manuscript assessed by a statistician. We have obtained some statistical advice in terms of the logistic regression, however we require a little more time to have the data reviewed by the statistician. We very much appreciate your understanding thus far in granting us several extensions and hope that after reviewing the current version you will allow us a little extra time to complete the statistical review.

Thank you and we look forward to your response.

Best Regards,

Aliki Christou and Sandra C Thompson
Responses to Reviewers’ requests for revisions

24 February 2012

Reviewer's report 1

Title: Colorectal cancer screening knowledge, attitudes and behavioural intention among Indigenous Western Australians

Version: 1 Date: 1 September 2011

Reviewer: John Condon

Reviewer's report:

The research question is clearly defined. The methods are appropriate and adequately described, with the exception of the multivariate analysis (see below). The data collection instrument and collection methods appear sound, with the limitation that ‘snowball’ recruitment from three urban areas was used rather than a random sample, so the results are not necessarily generalisable to the wider Indigenous population. This limitation is adequately addressed in the discussion.

Despite this limitation, the study identifies important issues that are relevant to the research question. The comments in the discussion and conclusion are reasonable and supported by the research results, within the limitations of the study that are adequately discussed. The title is appropriate, the abstract summarises the main points well, although the results and interpretation of the multivariate analysis of ‘intention to screen’ may need modification (see below).

Major compulsory revisions

1. The Background is too long and much of its contents would be more appropriate in the Discussion, such as paras 2, 3, 4, 6 and part of 7. Discussion para 1 is a repetition of comments in the Background.

   We have rewritten and reordered the introduction and discussion based upon the reviewer’s comments. All paragraphs mentioned have either been moved to and integrated into the discussion or deleted from the document.

There are several issues about the multivariate analysis of ‘intention to screen’ that need to be clarified.

2. There is an inconsistency between the results of the univariate and multivariate analyses of variables associated with ‘intention to screen’ (Tables 5 and 6). The odds ratios (ORs) for the variables (except gender) in the final model are very large, but the ORs for the same variables in univariate analysis are much smaller: age 18.41 c/w 1.69, marital status 18.30 c/w 5.96, perceived self-efficacy 41.05 c/w 13.4, participated in screening in the past 12.45 c/w 3.83. This suggest that there were one or more very strong confounders of the univariate associations with ‘intention to screen’; this needs to be explored and explained in more detail because it raises more questions than it answers.
We are in the process of addressing this issue, and obtaining statistical advice on the appropriateness of our analysis. We will require a little more time to finalise this. We have included extra tables after table 6 showing the model if age is removed and if marital status is removed. In these cases OR are reduced quite substantially.

3. The authors need to clarify which variables were considered for inclusion in the multivariate analysis of ‘intention to screen’ (Methods para 6). Were all variables in tables 1, 2 & 4 considered, or only those in table 5?

Only those variables in Table 5 were considered for inclusion in the multivariate analysis. A footnote has now been added to the Table 5 to make this clearer. We did not include those variables that had over 10 missing responses or p-values more than 0.20, so this excluded 8 of 26 variables. We also excluded the item: bowel cancer is asymptomatic as this was taken into account when calculating the total knowledge score. This left 17 variables for inclusion in the first round of logistic regression which are listed below:

1. Gender
2. Age
3. Marital status
4. Employment
5. Education
6. Last time you saw a doctor?
7. How often do you see a doctor?
8. Participated in any cancer screening in the past?
9. Ever had a colonoscopy?
10. Have you seen or heard media advertising related to bowel cancer?
11. Knows someone with cancer?
12. Ever heard of bowel cancer before?
13. Every heard of the FOBT/bowel cancer screening test?
14. Knowledge score
15. Perceived self-efficacy – how confident are you to carry out the FOBT test?
16. Perceived susceptibility – Do you think you are at risk of bowel cancer?
17. Perceived severity – Bowel cancer can be cured if found early

4. In the same para, the authors also need to clarify what they mean by the term ‘entry method’ in regard to selecting which variables to include in the final model; the description sounds like backward elimination, but the term ‘entry method’ suggests forward selection. The criteria used to select variables for the final model are also unclear. The authors state they removed variables that were ‘...least related to the outcome until only variables with a p<0.05 remained while still controlling for age, gender and marital status’. Strength of association is determined by the size of the odds ratio, not the p-value; which was used?

The ‘enter’ method is the default option in SPSS for conducting logistic regression
and is neither a backward nor a forward selection method. All variables are entered into the model and logistic regression performed including all variables. This function allows the manual removal and addition of variables. We initially ran the backward stepwise approach to explore predictors and achieved a very similar outcome to using multiple rounds of the enter method and sequentially removing variables with the highest p-values until only those with p values of less than 0.05 remained. However, as we wanted to control for gender, age and marital status, these variables were kept in the model. The only factor that was not significant and which we retained in the model was gender.

5. The variable retention criteria for the final model (only variables with p<0.05) were too restrictive, given the relatively small sample size and the very large odds ratios of the three variables that were retained. Were there other variables with large odds ratios but p-values that were a little larger than 0.05? This would be suggestive of an association that may have not reached the arbitrary 0.05 level because of the small sample size. If so, these should be included in the final model, or at least mentioned in the text if not included.

None of the variables excluded from the model had p-values close to 0.05. The smallest p-value observed was 0.254 which was for the variable, ‘how often do you see a doctor?’ which was the ninth variable removed after sequential rounds of running the logistic regression.

In order, the following variables were removed from the model and their corresponding p-values in the model are indicated below:

1. Educational status  p=0.770
2. Heard of bowel cancer before p=0.798
3. Seen media advertising related to bowel cancer, p=0.705
4. Last time saw a doctor p=0.551
5. Employment =0.822
6. Ever had a colonoscopy p=0.418
7. Perceived severity p=0.415
8. Ever heard of FOBT test p=0.430
9. Perceived risk p=0.403
10. How often do you see a doctor p=0.254
11. Know someone with cancer p=0.288

Minor essential revisions

6. The age range of participants needs to be clarified. The eligibility criteria include age 40 or more (Methods para 1), but the Tables include age-group ‘25-44’, or ‘up to 44’, with 26% of participants in this age-group. If this is actually age-group 40-44, why were 26% of participants recruited in this relatively small and young age range, given that the first screening age is not until age 50?

Although first screening age is 50 years in the National program, Indigenous Australians are at higher risk at a younger age, and according to the Cancer Council,
screening kits were being sent to Indigenous Australians from the age of 45 rather than 50. Our sample did include some individuals aged from 35 years, even though our initial criterion was 40 years and this explains why the 25-44 year age group comprised of about 25% of our sample population. Our eligibility criteria statement has been adjusted to reflect this. During this study many individuals younger than 50 expressed interest in participating. As part of the reciprocity required in Indigenous research, we undertook some education sessions following the survey interviews and were reluctant to turn away those wanted to learn about the prevention of bowel cancer, and who could have an important role in transferring messages to older family members and perhaps encourage them to participate. It also made more sense to target individuals for education at a younger age before they reach high risk age.

7. The authors need to clarify how the knowledge score was calculated. There are 24 knowledge items listed in Table 2 but the Methods section states that “A knowledge score was computed for each respondent based on 18 knowledge items...” (Methods para 3), and there are a different number of respondents for each knowledge items; 19 of the 24 items had 91-93 respondents, but the other five had only 61-88 respondents.

Knowledge score was based only on questions related to risk factors and signs and symptoms of bowel cancer. One survey item which was initially missing from the original Table 2 has now been added in. Questions on anatomical knowledge were not included as part of knowledge score as these asked respondents if they knew what bowel or rectum were and although they were asked to point out the part of the body being referred to in a diagram it was considered as self-perceived knowledge rather than actual knowledge. Age most at risk was also not included as this is was phrased as an open-ended question in the survey and in many cases was not answered by respondents. Given the confusion surrounding the age at which Indigenous people are at greatest risk and that 50 years is promoted nationally for the NBCSP, there arguably can be confusion regarding the correct answer. Frequency of screening was also not included as part of the knowledge score as testing in Australia only began in 2006 and at present is only offered as a once-off test, thus people would not be aware that it should be done every two years.

We have removed items from the table that were not included in knowledge score so as to avoid any confusion for the reader.

8. Remove reference to the content analysis (Methods para 6); no results of the content analysis are presented.

This has been removed.

9. The ‘don’t know’ category is inconsistently combined with the ‘no’ category in the tables, both between tables and, in Table 4, within the table; for several variables, the combined category is the majority of respondents. The authors should explain why these two categories were combined for some questions.
Where the format of the question answer was yes, no or don’t know, the no and don’t know categories were combined (see below for list of questions we did this for). For these particular questions we were really interested in those who responded with yes to see what factors may be associated with a positive response. As our sample size was so small it made more sense to combine the no and don’t know categories for analysis.

- Participated in any screening in last two years
- Ever had a colonoscopy
- Seen or heard advertising about bowel cancer
- Knows someone in family with cancer
- Think they are at risk of bowel cancer
- Worried or concerned about getting bowel cancer in the future
- Knows someone in family with cancer
- Ever heard of bowel cancer before
- Ever heard of bowel cancer screening test
- Aware bowel cancer/polyps can be asymptomatic

Some questions did not have a “don’t know/unsure” category, for example perceived self-efficacy did not.

10. Results para 9: it is not clear what the final sentence means.

The paragraph being referred to:

‘Those who said they would consider doing an FOBT test were also significantly more likely to do a test if a doctor recommended it, while those who said they would not consider doing a test were more likely to not do a test even if a doctor recommended it ($X^2$ [1], n=92) =30.6, $p<0.0001$) indicating that those refusing to consider FOBT screening remained unlikely to do so despite a doctor’s recommendation.’

Now reads as follows:

‘Those intending doing an FOBT test were significantly more likely to do a test if a doctor recommended it, while those who said they would not consider doing a test were more likely to not do a test even if a doctor recommended it ($X^2$ [1], n=92) =30.6, $p<0.0001$), suggesting that those refusing to consider FOBT screening remained unlikely to do so despite a doctor’s recommendation.’

Essentially this is suggesting that those who refuse to consider screening are more likely to continue to refuse screening even with a doctor’s recommendation. So with this particular sub-group of people, other factors need to be considered to motivate participation.
11. Discussion para 6, first sentence. Change ‘received’ to ‘completed’ or ‘had’; it sounds like these were people who received a FOBT test kit in the mail. Same para, final sentence refers to ‘...the recall of kits in late 2009...’. This has not been mentioned previously and assumes the reader knows about this event; it needs a little explanation.

Wording had been changed to ‘completed.’ This question in fact referred to participants who had completed an FOBT screening kit that had either been received by mail or had been given to them. Some participants may have confused this with doing a stool test.

Explanation of kit recall is now included in Box 1 as part of the introduction.

Discretionary revisions

12. It would be informative to provide a comparison of the distribution of socio-demographic characteristics in the total WA or Australian Indigenous population to give some indication of the representativeness of the sample (Results para 1). Census data are available for most of the characteristics listed.

We agree this was a good suggestion however it is difficult to make direct comparisons as the data from the ABS reports are for all Indigenous people whereas our sample only included those aged from 35 years onwards and we had a very small number of males participating. The other issue is that we did not use the same categories as was used in the census survey. In hindsight, we realise this should have been done to be able to provide appropriate comparisons to this data.

13. The presentation of results in the text reports the proportions of positives or negatives inconsistently, which is confusing; for example in Results para 3, the final sentence states that 30% is higher than 86%.

This has been amended and reworded to make the results clear. We have reviewed the whole document for similar statements and fixed these as well.

14. Results, all paras. P-values are not needed in the text when they are included in the tables, and unnecessarily impede easy reading.

Some p-values have been removed as suggested, however the second reviewer requested p-values be added in to the text when discussing odds ratios in particular (see point 14 below).

15. The Discussion does not seem to be coherently structured. It could be better organised, perhaps, by grouping the issues into themes such as knowledge of bowel cancer, knowledge of screening, and intention to screen. At present, it seems to jump from issue to issue.

Discussion has been restructured and headings inserted to ensure better flow and coherency.
16. It would be informative to include a multivariate analysis of associations between the variables in Table 3 and ‘knowledge score’ because a strong association was found between ‘knowledge score’ and ‘intention to screen’, and between several socio-demographic variables and ‘knowledge score’, but not between these socio-demographic variables and ‘intention to screen’. However, multivariate analysis may not be appropriate because of the small sample size (see comments re analysis of ‘intention to screen’).

We have not had time to complete this analysis however the problem of sample size is likely to be an issue. We are in the process of examining this and should have a result in the next week or two.

**Minor issues not for publication.**

- Background para 7 sentence 2, add ‘of’. **Done**
- Results para 8 sentence 1, delete ‘the’. **Done**
- Results para 10 sentence 2, add ‘be’ & ‘in’. **Done**
- Limitations para 3 sentence 1, there are words missing, this sentence does not make any sense. It is not clear what ‘desirability bias’ refers to. **Modified**

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests
Reviewer's Report 2

Title: Colorectal cancer screening knowledge, attitudes and behavioural intention among Indigenous Western Australians

Version: 1 Date: 9 September 2011

Reviewer: Sarah Damery

Reviewer's report:

Major compulsory revisions

ABSTRACT

1. The results section of the abstract is confusing. The authors state that “Almost a third (63%) of respondents reported intending to participate in screening”. 63% is not one third.

   This error has been addressed and should have read as ‘almost two thirds’.

BACKGROUND

2. The background needs to be significantly shortened. There is a lot of repetition, and although much relevant literature is referred to, a re-structuring of this section would improve it considerably and make the salient issues clearer.

   As recommended the background has been shortened with various sections moved to the discussion as suggested by reviewer 1.

3. The aims of the research need to be clearly stated in the background section.

   The aims of the research are now more clearly defined in the last paragraph of the background (page 6-7).

4. The way that the Australian bowel cancer screening programme operates needs to be described in more detail. At present, the only information offered is that the programme started in 2006, uses FOBT, and offers screening at the ages of 50, 55 and 65. The implications of poor uptake, and potential improvements to the programme cannot be assessed if readers are not made fully aware of the detail of the current operation of screening in Australia.

   We have now inserted a box in the background section describing in greater detail various aspects of Australia’s program. This should be sufficient for readers to gain a good overview of the current program as well as a brief history and background to some of the issues faced.

METHODS

5. The survey instrument should be uploaded as a supplementary file if this has not
already been done.

This will be uploaded along with the revised manuscript.

6. The way that the knowledge score was derived needs to be better described, particularly with regard to the way that the different facets of knowledge were treated in the analysis, and how the different responses were categorised and grouped.

Cut-off points were selected based on dividing our sample population in almost equal thirds so that each third contained roughly the same number of cases. This led to the following categories: low 0-11, medium: 12-15, and high: 16-18. Our responses were distributed towards greater knowledge with very few participants having a score less than 6 so it did not make sense to divide the total score based upon being one third of the range (ie 0-6, 7-12, 13-18). Respondents in the bottom third were considered to have lowest knowledge, the middle third as medium knowledge and top third as high knowledge.

7. Participant selection: why did the study sample include individuals aged between 25-44 years of age when the study inclusion criteria were stated as 40+?

Please see our justification above in point 6 above responding to Reviewer 1’s suggested revisions.

8. The regression methods described appear to relate to a backwards stepwise model rather than a forward one: this needs to be clarified

Our regression method was essentially a backward stepwise approach. The logistic regression function used in SPSS is the default ‘enter’ method and is neither a backward or forward stepwise approach but allows the manual removal and addition of variables. We initially ran the backward stepwise approach to explore predictors and achieved a very similar outcome to using multiple rounds of the enter method and sequentially removing variables with the highest p-values. All variables with p values of 0.20 or less, and with less than 10 missing responses were included in the first round of logistic regression using the enter method. We then manually removed variables with the highest p value sequentially until only those with p values of 0.05 or less remained. However, as we wanted to control for gender, age and marital status, these variables were kept in the model. The only factor that was not significant and which we retained in the model was gender.

RESULTS

9. The way that the results are described is often incredibly confusing, and it is frequently unclear which numbers are being referred to and how these relate to the tables. For example, one sentence states “Only 15% (11/72) could give a correct description of any aspect of bowel cancer. Even fewer were aware of what polyps were (29%, 25/86). 29% is not fewer than 15%.”
These statements have been revised and are now clearer.

10. Similarly, another sentence in the results section says that “Most (86%) respondents did not know what an FOBT/bowel screening test was...only a slightly higher proportion (30%, 27/91) reported having ever heard of this test. Again, 30% is not higher than 86%. These inconsistencies need to be clarified.

As above, these have been modified.

11. Where percentages are stated, the number of individuals that this refers to needs to be stated also. This is particularly important given the confusions that I have noted above.

   We assume this is in reference to stated percentages in the text of the paper. We have inserted number of individuals as a fraction of the total sample in brackets next to the stated percentages. In the case where data is not shown in the tables then this is justifiable and should be in the text, however it seems unnecessary in the case where the data is presented in the tables and impedes reading of the text.

12. Significantly more detail on the multivariate analyses needs to be offered.

   We are still in the process of reviewing the logistic regression and will add further detail as suggested.

13. The “Factors affecting screening intention” section, under “socio-demographic factors” has a typographical error. The sentence in question currently reads “Those who intended to participate in screening were more likely to married or de-facto relationships”. There are some words missing here

   This error has been addressed.

14. If talking about certain sub-groups being x times more likely to do something or to have a particular attitude, then the odds ratios are needed, either instead of, or preferably in addition to, the p value.

   This conflicts with the request from Reviewer 1 (see point 16) not to include p-values. We have included OR with CI rather than p-values.

15. It is unclear why the odds ratios for the multivariate analyses are higher than the univariate analyses. Statistical review of the manuscript may be required.

   We are currently reviewing this issue and obtaining statistical advice to identify the problem. It does seem that confounding may be an issue.

**DISCUSSION**

16. This needs to be sub-divided into sections as the present structure is rather scattergun and difficult to follow in places.
Discussion has been restructured and headings inserted to ensure better flow and coherency.

17. In the paragraph beginning “only 5% of our sample...”, reference is made to kit recall in 2009. The reader will be unaware of what this means. As I said at the beginning of this review – providing more information and background to the operation of the bowel cancer screening programme in Australia would go a long way to addressing these sorts of issues.

This has now been addressed in the box inserted into the Background section.

18. Intention is conflated with uptake several times throughout the discussion. For example, the authors state that 87% of people said that they would do the FOBT test if their doctor recommended it, which is consistent with other studies that show endorsement of screening by a primary care professional can facilitate participation. This is not actually the same thing, and goes back to the hypothetical vs. real world uptake issue that I alluded to earlier. These inconsistencies need to be addressed.

We have revised this statement along with others in the document that imply intention is the same as participation.

CONCLUSIONS

19. These need to come after the limitations section.

Conclusions have now been moved after the limitations section.

20. The conclusion section is too long, and would benefit from being shortened, otherwise it merely repeats what has been said in both the background and discussion sections.

Conclusion has been shortened and modified

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests.