Author's response to reviews

Title: Research activity and capacity in primary healthcare: The REACH study: A survey

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Author's response to reviews: see over
Dear Editorial Team,

Thank you for your reply dated December 29 2008 to our submission of the above paper. We, the authors, are pleased to submit a revised copy of the manuscript for review for publication.

The REACH study is an important study, examining research activity and capacity in primary healthcare a single health authority in the West of Ireland (the Health Services Executive Western Region). This study also examines the factors that may promote or inhibit research activity and highlights the issues that should be addressed in order to encourage and facilitate engagement in research and development within primary care. Further to this, a possible target population of professionals is identified for future research and development strategies.

Many thanks for your comments and suggestions, which we have no doubt have improved the quality of the paper. We have set out our response to the suggested revisions below in italics and revised our manuscript accordingly (indicated by text in red underlined).

Yours sincerely,

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Referee 1:

General feedback
This is an interesting study that has been well performed and written. It highlights the current status of research activity and attitude among PHC professionals. It provides baseline data that can assist in further exploring the underlying factors and mechanisms of the shortage of interest and engagement in research. Some considerations for the authors below.

Major revisions
1. The conclusions do not match the results of the study. E.g. the authors mention lack of protected time as the first issue to be addressed, yet this only ranks 8 on the R&D list. The most important issue seems to be access to training and support. The latter is very important (as the respondents indicate) yet it is not mentioned further. There seems to be some bias in the interpretation of the results.

The reviewer rightly identifies this bias in the interpretation of the results. We have removed this interpretation element from the conclusions and have now aligned the conclusions directly with the results section in the abstract and the main paper.

2. The R&D Index may indeed as the authors mention, not be a useful tool. The score cannot differentiate which domain is important. The ranking is much more useful to understand what the needs of the health professionals really are. Page 13 discusses this, however, no reservations are made when drawing conclusions based on this tool. How can the tool be used to identify target groups?

In the limitations section we recognise the limitations of the R&D Index as a research tool. This is important as these limitations had not been recognised previously in publications using the R&D Index. However, it is also important to recognise that the issue of research activity and capacity is a very complex one with many possible influencing factors and while the R&D Index is an imperfect research tool it does provide some indications of factors that need to be addressed in order to promote a culture of R&D in primary care and does identify (in this study and previous studies using the R&D Index) through a scoring system differences among healthcare professionals. The identification of professional groups or groups within professions (those with research training) who have a more positive attitude to R&D, may allow such groups to be targeted in future R&D strategies.

3. How representative is the sample? There is no comparison on other characteristics than profession. Very low response rate!!

We feel the sample in the study is a representative sample as we included all primary healthcare professionals (with no exclusions) of the following professional groups working within a large health authority of over one million people in a mixed urban/rural setting in the West of Ireland: community pharmacists; general
practitioners (GPs); practice nurses; primary health care managers; public health doctors; public health nurses. For baseline characteristics, we compared groups according to profession as previous research in this area highlights the differences that are present among professional groups. However for the R&D Culture Index Score we used regression modelling to examine the dependence of R&D Culture Index Score on sixteen different possible explanatory variables: age, gender, work status, professional group, professional registration, number of years registered, postgraduate qualification, higher training qualification, research training, time in post, research involvement, named applicant on research funding application, named applicant on research ethics application, author of peer-reviewed publication, author of non-peer reviewed publication, presenter of research conference paper. Two different statistical approaches were used; multiple regression (using variable selection techniques) and regression trees. We recognise that a response rate of 54% does limit external validity and have mentioned this in the limitations section. However, this response rate is comparable to, or better than, other studies using the R&D culture index and is above average for current postal questionnaire research.

4. The authors have not corrected for involvement in training of students/link with university. This could be an important issue (training opportunities and ongoing support).

We have not corrected for involvement in training of students/link with university as this data was not available to us and as the reviewer rightly points out this could be an important issue. However, in our regression analysis, we did control for sixteen explanatory variables which included variables which could be argued are a proxy for university links such as research involvement, named applicant on research funding application, named applicant on research ethics application, author of peer-reviewed publication, author of non-peer reviewed publication, presenter of research conference paper.

5. There is no mention of other activities that are research related, such as journal clubs or EBP meetings within practices.

Data on other activities that are research related, such as journal clubs or EBP meetings within practices was again not available to us for and as the reviewer rightly points out this could be very relevant. However, we did endeavour to capture research activity in detail with the following variables measured and included in the regression models: current and previous research involvement, named applicant on research funding application, named applicant on research ethics application, author of peer-reviewed publication, author of non-peer reviewed publication, presenter of research conference paper.

6. The conclusion (page 13 and abstract) is interpretation, not following from the results.
The reviewer rightly identifies this bias in the interpretation of the results. We have removed this interpretation element from the conclusions and have now aligned the conclusions directly with the results section in the abstract and the main paper.

7. Figure 3 indicates no difference in score between groups?

Figure 3 has been removed from the paper as it had been incorrectly constructed. The mean scores for the different professional groups are displayed at the bottom of Table 1. A One-way ANOVA test shows a statistically significant difference in the mean R&D Index scores across the different professional groups.

Minor revisions

8. An interesting finding is that confidence about doing research ranks very low. When working with novice researchers this is often a very important factor. “A perceived lack of confidence seems to persist” (page 11). Is this a longitudinal study?

The reviewer rightly points out this is not a longitudinal study and the above statement is methodologically incorrect. It has now been altered to reflect the methodology of the paper.

9. Any differences between professional groups in ranking?

We found some differences between professional groups in terms of ranking but no striking patterns and for the sake of clarity and succinctness we could not report all results. As the R&D Index score is a composite score, this is where we concentrated our results and conclusions as we felt this was the most methodologically sound approach.

10. Page 9 interpretation should go to discussion.

Page 9 interpretation has been removed from the results section and is now included in the limitations section of the discussion.

11. Page 10: in the discussion new findings are presented (GP least likely to want to learn more). This should be addressed in results if worthwhile to discuss.

In an effort to be concise and to the point, as is rightly suggested by the reviewer in point 12 below, we have removed this new finding from the discussion section and have reduced repetition of results in the discussion section.

12. Discussion has a lot of repetition of results; be concise and to the point.

See point 11 above.

13. Table 1: what does the p-value refer to?
In table 1, the p-value refers to the significance level of the test used to compare each of the variables in the table between the three professional groups. The statistical tests used were one-way ANOVA for continuous variables and Chi-square test for categorical variables.

14. Table 2: differences according to profession?

We found some differences between professional groups in terms of scoring and ranking but no striking patterns and for the sake of clarity and succinctness we could not report all results. As the R&D Index score is a composite score, this is where we concentrated our results and conclusions as we felt this was the most methodologically sound approach.

15. Table 3: can be discussed only in text (table not necessary).

Table 3 has been removed from the paper and the results contained in table 3 are now discussed only in text in the comparison with existing literature section of the discussion.

16. figures 1 and 2 not useful.

Figures 1 and 2 have been removed from the paper and the results contained in them are now described only in the text of the paper.

17. Figure 4: what is the purpose of this figure? It is not helpful in understanding and the text below does not seem to refer to anything.

The purpose of figure 4 (now Figure 1 in the revised paper) is to illustrate in a fuller way the findings from the statistical regression model. This regression tree model is a new but recognised technique in biostatistics to illustrate succinctly the relationship between a dependent variable (in this case the R&D Culture Index Score) and a number of possible explanatory variables. So for example, looking at the figure we can tell that an individual with previous research training and research involvement will have a higher R&D Culture Index Score than someone with previous research training but no research involvement. Thus the tree illustrates that just the relationship between the R&D Culture Index Score and a single explanatory variable but rather it models multiple variables simultaneously. The text below the figure describes the explanatory variables used in the statistical model which generated the regression tree. This is described in more detail in the methods section of the paper.

Referee 2:

This manuscript assesses the level of research activity and capacity for research among primary healthcare professionals.
Major Compulsory Revisions:

1. Page 2 (Background) and Page 3 (Background): It is unclear if the authors feel that the level of engagement of primary healthcare professionals with research remains poor in Ireland or in the UK, or if this is a universal problem. If universal, include additional references.

This study is primarily a comparison of the level of engagement of primary healthcare professionals with research in two health systems, the UK and the Republic of Ireland as there is little other international evidence on this subject elsewhere. Recently, there has been increased funding and support for primary care research in the UK but the level of engagement of primary healthcare professionals in research activity appears to have remained static during this period. The Republic of Ireland has a similar healthcare system to the UK but lags behind in terms of research funding. This study presents the first available evidence in regard to research activity and capacity of primary healthcare professionals in the Republic of Ireland and provides a useful comparison to the UK data available. The text in the background section has been adjusted to reflect this.

2. Page 5, lines 12-13: The authors state that the baseline characteristics of study participants were analyzed with 1-way ANOVA and chi-square. It is unclear in terms of what variable(s) these baseline characteristics were analyzed – professional group? Anything else?

For baseline characteristics, we compared groups according to profession as previous research in this area highlights the differences that are present among professional groups. We did perform other comparisons but for the sake of clarity and succinctness we could not report all results. However for the R&D Culture Index Score we used regression modelling to examine the dependence of R&D Culture Index Score on sixteen different possible explanatory variables: age, gender, work status, professional group, professional registration, number of years registered, postgraduate qualification, higher training qualification, research training, time in post, research involvement, named applicant on research funding application, named applicant on research ethics application, author of peer-reviewed publication, author of non-peer reviewed publication, presenter of research conference paper. Two different statistical approaches were used; multiple regression (using variable selection techniques) and regression trees.

3. Page 6, Results, line 13: Should the public health doctors be grouped with the GPs rather than with other HSE staff? If no, why not?

In apposition to the UK, GPs in the Republic of Ireland, are self-employed independent contractors whereas public health doctors work as direct employees of the Health Service Executive (HSE). Thus we felt from a work practice, opportunities for training etc. point of view they would have much more in common with other HSE staff. This was pointed out during consultation with members of the different professional groups included in the study during the study design period.

4. Page 11 – Last paragraph: Clarify that there is no information about
non-responder practicing nurses. An additional limitation is that the authors were not able to include in the study other primary health care professionals in the community.

*Both the above limitations have been added to the strengths and limitations section of the paper.*

5. Page 12, line 11: Although the authors refer to international literature, in fact it is UK literature.

*This has now been clarified in the text and in point 1 above*

6. Figure 3: Title should read “Box plot of R&D Culture Index Score by Professional Group.” Box width, mean symbol, and other aspects of figure should be clearly explained in footnotes.

*Figure 3 has now been removed and the results in figures are included in table 1*

7. Figure 4 should include Presenter of research conference paper also, as it is a covariate in the final tree regression model.

*The reason ‘Presenter of research conference paper’ is not included in the final tree regression model in the figure is set out below and has now been clarified in the methods section and in the text under the figure.*

The regression tree approach identified two different trees as potentially optimal (on pruning); one \( (r^2 =20\%) \) had the identical explanatory variables as identified using multiple regression (Figure 1) [ie: ‘research training’, ‘research involvement’ and ‘professional group’] while the other tree (not illustrated in figure 1) \( (r^2 =20\%) \) included ‘presenter of research conference paper’ rather than ‘research involvement’.

**Minor Essential Revisions**

1. Page 3, line 6: “In addition, …”

*This has now been corrected.*

2. Page 3, line 8: “an increase in the quality of care provided…”

*This has now been corrected.*

3. Page 3, line 17: “Holland, …”

*This has now been corrected.*

4. Page 4, Methods, first line of 2nd paragraph: “The postal questionnaire used in the study consisted of three sections. Section A…”

*This has now been corrected.*
5. Page 5, line 7: “five items that they perceive…"
This has now been corrected.

6. Page 6, Results, line 9: “less. Only 12%...
This has now been corrected.

7. Page 6, Results, line 13: “…Figure 1.”
This has now been corrected.

8. Page 6, Results, line 14: “of the study participants and R&D Index Score…”
This has now been corrected.

9. Page 6, line 15: “predominantly male, working full-time, …”
This has now been corrected.

10. Page 7, line 8: “(48%)”
This has now been corrected.

11. Page 7, line 8: “there appeared to be both a high level of awareness of the influence of research on professional practice (83%) and a …”
This has now been corrected.

12. Page 7, line 17: “ranking of the eighteen …”
This has now been corrected.

13. Page 7, line 20: “relate to respondents’ …”
This has now been corrected.

14. Page 9, paragraph 2: “The best regression model identified three significant explanatory variables which explained the dependence of R&D Culture Index score on the available covariates using both statistical approaches: research…”
This has now been corrected.

15. Page 9, paragraph 2, line 7: “included ‘presenter of research conference paper’ rather…”
This has now been corrected.

16. Page 9, 4th from the last line: “identify a nearly identical subset of useful explanatory variables, the possibility…”
This has now been corrected.

17. Page 10, Discussion, line 10: “This may be due to factors discussed in this…”

This has now been corrected.

18. Page 11, line 9: “opportunities, but only about half of the respondents…”

This has now been corrected.

19. Page 12, line 17: “appear to be involved…”

This has now been corrected.