Author's response to reviews

Title: Predictors of two forms of attrition in a longitudinal health study involving ageing participants: An analysis based on the Whitehall II study.

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Author's response to reviews: see over
Author's covering letter for initial submission

Title: Predictors of two forms of attrition in a longitudinal health study involving ageing participants: An analysis based on the Whitehall II study.

Authors:

Version: 1 Date: 11 September 2012

Comments: see over
Dear Editor,

Thank you for the reviewers comments to our manuscript. We value their opinion greatly. Each of the comments have been answered in turn below. We look forward to your favourable response.

Reviewer 1: Zelinsky

1. Is the question posed by the authors well defined?

Attrition is a major concern in longitudinal research and identifying issues related to missingness is critical to providing generalizable conclusions about longitudinal outcomes.

2. Are the methods appropriate and well described? (major compulsory revisions) The results section of the ms is very difficult to follow with essentially no information about the methods used. I know that medical journals move methods to the final sections of the narrative, but many of them provide at least some preview information about the approach used. In this case, the statistical modeling approach used should be described in broad outline.

We have restructured the manuscript to bring the methods section forward.

I do have a conceptual concern about the relevance of nonresponse for understanding findings if the participants respond at a later time. The analysis as I understand it evaluated nonresponse at a given occasion as the outcome. This suggests a cross sectional analysis that aggregates over occasions. However, it is not completely clear how this would affect actual longitudinal trends in the data.

We agree that cross-sectional analysis would be inappropriate for non-response. For this reason, multilevel regression models are widely used in analysis of longitudinal data, allowing us to incorporate the auto-correlation structure in the data so that the results are not biased, which would be likely with a cross-sectional analysis such as the reviewer describes. We have reviewed the methods section to make this point clearer.

This may be a disciplinary issue. I am a psychologist and would be most interested in permanent dropouts, as estimates of cognitive ability change do not vary much in those who may miss a data collection occasion but return later. The value of longitudinal analysis in my view is to estimate change patterns rather than to examine a series of cross sectional snapshots. I would think that a comparison of the withdrawers with the permanent dropouts (the last occasion of participation) would be of interest.
In health studies such as Whitehall II, outcomes can change quickly, indicating a change in health status precipitated by acute changes in health or psycho-social status such as stroke, hip fracture or bereavement. If these factors also increase the participant’s chance of not responding, then it is important to be aware of the relationships with attrition so that potential bias can be eliminated through methods such as multiple imputation or doubly robust estimators, or at least described objectively. We have reviewed the background and discussion sections to make this point clearer.

3. Are the data sound?

The data are undoubtedly reliable but important information such as reason for withdrawal or for nonresponse in those who return is not available. This dampens enthusiasm for the findings.

This is an important limitation to the data and we have added it to the discussion.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition? Yes

5. Are the discussion and conclusions well balanced and adequately supported by the data?

The methods are transparent with respect to limitations for answering the question. However, no specific hypotheses about predictors of missingness are presented nor any recommendations for steps to reduce missingness other than oversampling, which is very difficult for certain participant groups, is discussed.

We have reviewed the methods section to clarify the goal of understanding predictors of attrition, and have added discussion about adjusting analyses to account for missing data. We believe this addresses the points raised.

6. Are limitations of the work clearly stated? Yes

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?

I believe that they are not tapping the attrition literature that has existed for many years in longitudinal studies conducted in the US. For example, in the Baltimore Longitudinal Study of Aging, Seattle Longitudinal study, etc.

We have clarified the previously published literature review in the background section.

Reviewer 2: Fullerton

The study investigates predictors of attrition in an ageing population (the Whitehall II cohort). Attrition can constitute a serious problem for the validity of longitudinal studies, so analyzing which characteristics of study participants are associated with attrition is of high importance for the planning of future studies. The authors separately look at two forms of attrition, non-response and active request to withdraw, which is an interesting issue that, I think, has not yet been addressed much in the literature. The main weakness of the work is in my opinion the description of the methods: the authors could improve the manuscript a lot by changing the structure of the article (especially by moving the methods section to before the results) and by providing the information necessary to understand why which methods were applied in more detail and a more coherent manner (also see more specific comments below).

We have moved the methods to appear before the results section, and have reviewed it in detail for clarity to address the points that reviewers have raised.

- Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)
1. I believe it would be good style to also cite the original pieces of work the authors refer to when talking about their review on attrition (Introduction, paragraph 2)

*We have clarified the role of the literature review in the background section.*

2. Figure 1 would better fit in the discussion section.

*We agree and have moved it to the Discussion.*

• Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Page 6, second paragraph, line 5: “We also found others studies” should be changed to “We also found other studies that”.

*We have made this correction.*

2. Page 6, beginning of paragraph 3: the reader does not necessarily know what constitutes the first or second part of the authors’ research, so for me it would be enough, and maybe less confusing, to just be told that the work uses data collected by the Whitehall II study.

*We have clarified this, including the role of our previous literature review in the background section.*

3. I would recommend moving the methods section to follow the introduction. It would make reading the results section easier.

*We agree and have made this change.*

4. Page 8, paragraph 2, line 2: “which has standard deviation” should be changed to “which has a standard deviation”

*We agree and have made this change.*

5. Page 17, first sentence: is redundant, was already in the second sentence in section “Predictor variables”.

*We agree and have deleted this sentence.*

6. Methods section: a large part of the methods appear under the section “Ethical approval”, while only the first sentence refers to this headline. An additional headline should be added.

*We have changed the sub-section heading to “Source of data”*

7. Conclusion/first sentence:

- “becomes” should be “become”

*Thank you, we have corrected this.*

- “and the validity of the study affected” should be changed to “and affect the validity of the study”

*Thank you, we have corrected this.*

- “if those who drop out differ to” should be changed to “if those who drop out differ from”

*Thank you, we have corrected this.*

• Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

1. Even though the research question is quite clear from the title alone, I think it should also be explicitly stated in the introduction.

*We agree and have added this.*
2. Has anyone else ever addressed the difference between non-response and active withdrawal? If yes, they should be cited. If the authors could not find any work addressing this difference, this should also be stated.

*Thank you, we are not aware of any work along these lines despite searching the literature, and have added this to the background section.*

3. Methods section, page 16 (top paragraph): The authors state that imputation of withdrawal dates would be inappropriate, but then report that they assumed them to lie around phase 4. What are the reasons for this assumption? Isn’t that kind of imputation for sure inappropriate?

*We had not explained this clearly, and have now revised it to clarify our methods. We did not impute withdrawal dates but rather we found that insight into the administrative process led us to conclude that almost all the missing withdrawal dates preceded Phase 4 and could be regarded as censored in the statistical sense.*

4. Page 19/Statistical analysis: “The explanatory variables were added in the order given above”: Not sure what “above” does refer to - page 16? But there SF36 is not listed? The authors should state more clearly which explanatory variables were included in what way in which model (please also describe in more detail the levels of the multi-level model)

*We agree and have listed the variables in order, and the definition of the levels.*

5. Page 20, last paragraph: the specification of the Cox model should be described in more detail: I assume the same covariates were included as in the other model? Please specify which of these covariates were time-varying and from which points in time data was included in the model for each covariate.

*We have added this detail.*

6. I would have appreciated more explanation for why these two different models were used to model non-response and active withdrawal.

*We have added a short rationale for each model.*

7. What do the authors mean with completeness of data (beginning of paragraph 1 in results)? Complete case analysis apart from the minor imputation mentioned in the methods section? A flow diagram would help the reader understand better what data exactly made it into the analysis.

*We have amended this sentence to clarify.*

8. Results: It would be more informative if the results for the not significant predictors & interactions were also shown.

*We have specified the research question which we feel explains this now; the results shown give the models which best predict attrition of each type, rather than a series of bivariate associations which would have little predictive ability.*

*We hope you agree with our corrections and look forward to hearing from you.*

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