Reviewer's report

Title: Assessing Nonresponse Bias in a Large Prospective Cohort of Relatively Young and Mobile Military Service Members

Version: 1 Date: 1 May 2010

Reviewer: Anne Tate

Reviewer's report:

This study compares the characteristics of responders and non-responders to the US military millennium cohort study's follow up questionnaire, using baseline demographic and military characteristics and responses to the original questionnaire. Propensity scores, based on these characteristics are used to construct inverse probability weights and to compare associations on several outcomes with and without weighting for non-response.

The conclusion is that “the analyses from this cohort should yield relatively unbiased results”.

This is a topic of great interest to me and part of the work described in this paper is similar to a study reported by myself and colleagues in this journal on a UK-based military cohort (Tate07). The authors do not seem to be aware of this work, but I think they should find it very relevant to this study.

Major compulsory revisions

1. The results are interesting in that they confirm other findings including those of our UK-based military study (Tate07) that less well-educated young men of lower rank etc. are less likely to respond to questionnaires, in this case the second time round. However, the authors have failed to examine what would seem to be a much greater possible cause of non-response bias – i.e. that only 30% of the original sample agreed to complete the initial questionnaire. Without accounting for the characteristics of these original “non-responders” who represent a much greater proportion of the sample than non-responders to the follow-up, the claims of the conclusions cannot be upheld.

In order to justify the conclusions, the authors need to consider non-response to both questionnaires, not just the follow-up. This should be possible as many of the factors related to non-response (i.e. the demographic and military data) were presumably known for the whole sample, and, as far as one can determine from the conclusions, it seems that these were the characteristics that had most influence on the weights.

2. Once this has been done, it might then be possible to make further inferences on non-response related to measures based on answers to the follow up questionnaire using the propensity scores based on the whole sample.

Minor Essential Revisions
1. “the major threat to the validity of results from such studies is nonresponse to follow-up surveys”

Change “the major threat” to “a (possible) major threat”. I would argue that misclassification is a greater threat, see Tate07, and in any case the conclusions of this study (which says that non-response is not a major problem in this study) contradicts this statement.

2. “Nevertheless, few studies have investigated factors predicting nonresponse in cohorts of younger adult participants.”

Tate09 analysed non-response for a very similar population (UK military). Please cite.

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The numbers quoted for the responders do not seem to add up. 76,018 individuals completed the baseline questionnaire and 76,861 (of these?) were alive at the time of the follow up – please amend or explain the increase.

4. The results section is confusing – particular wrt to the section describing the distribution of the propensity scores, depicted in Figure 1. I suggest that this section is removed and that the authors focus on how these scores relate to the measured characteristics.

Discretionary Revisions

1. The methods section is overly long. Some methods are fairly standard for this type of analysis (e.g. propensity scores) and could be referenced instead of described in such detail. The results section could also benefit from being more succinct.

2. This study could benefit from an analysis, or at least a discussion, of the potential threat of misclassification bias, as this could pose a far greater threat to the results than non-response. Were any questions built into the second questionanaire to check for this e.g. asking the same question again in a slightly different way? If so an analysis of such responses could be very informative. It is a shame that so many studies neglect to look at misclassification, and only check for non-response bias.

3. It would also be interesting to investigate whether the mode of answering the questionnaire had an effect on the responses

[Tate07] How many mailouts? Could attempts to increase the response rate in the Iraq war cohort study be counterproductive?

A Rosemary Tate, Margaret Jones, Lisa Hull, Nicola T Fear, Roberto Rona, Simon Wessely, Matthew Hotopf
BMC Medical Research Methodology 2007, 7:51 (28 November 2007)

Level of interest: An article of limited interest
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