Reviewer’s report

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

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Reviewer: Marcel Goldberg

Reviewer’s report:

This manuscript deals with nonresponse during follow-up (FU), an important methodological problem in longitudinal cohorts. While a certain rate of nonresponse is unavoidable, it can yield biases in measures of association, and it is thus important to identify characteristics linked to nonresponse and to assess the magnitude and direction of biases which are induced.

This work relies on the first FU wave of the Millennium Cohort Study, a military cohort. This is one of the main strengths of this work, since this cohort is made up of young and very mobile persons, and it is interesting to check whether attrition in such a sample would induce important biases. In all, of 76,775 subjects who completed the baseline survey, 54,960 (71.6%) completed the FU survey. The authors first identified the main sociodemographic, behavioral, military, and health-related characteristics linked to nonresponse in FU. Then, they used logistic regression models to calculate inverse probability weights using propensity scores for calculating a probability weight for each person, which was introduced in association analyses for physical and mental health outcomes and self-reported health, in order to compare the results with published findings and check whether nonresponse induced biases that affected the results.

As expected, most of the selected characteristics of the subjects were associated with the probability of response. More interestingly, the authors showed that nonresponse did not result in appreciable bias for most of the associations, which is reassuring.

Globally this is an interesting paper with quite important results. However, I have some methodological and formal concerns.

Major Compulsory Revisions

Methodological problems

• In this kind of analysis, it is usual to group subjects into propensity classes, in order to avoid giving too much weight to few subjects with extreme values (see for instance: Jenkins et al., Am J Epid, 2008;167:369-374): when looking at figure 1 and the small number of subjects with a very low probability of responding, this should obviously have been done here.

• I do not understand what are “p-values methods” (page 8, last line of para 1).

• There no mention at all of deaths occurring between the inception of the cohort and the FU survey: does it mean that deaths were not traced?
There are some discrepancies in the numbers of subjects at baseline: page 6 line 2, 76,018 subject completed the baseline questionnaire, elsewhere they are 76,681, and sometimes 76,775… You should have read more carefully your manuscript before submission!

The Methods section is not clearly written and a little bit confusing: a clear description of each step of the analyses would help.

Page 12, 3 lines before the end, it is stated that the OR for drinking problems and PTSD in Marine was 1.73 in the unweighted analysis and 1.60 in the weighted one, but I cannot see these figures in Table 4.

Why some FU data (military status at FU) were introduced as “Baseline characteristics” (table 1)? This is very confusing.

Minor Essential Revisions
There are some mistakes in the references:
Ref 5: “of the findings…” (not “of the finigs…”)
Ref 8 is not complete
Ref 15: “of the wars…” (not “of the warns…”)
The figure 1 is a raw output from the computer: it could have been nicer!
Finally, this manuscript needs some rewriting and editing.

Discretionary Revisions
The models which were constructed can not be verified in this kind of exercise, and it could be worth to perform analyses for the same associations than in this manuscript at baseline, with and without the subjects who did not answer at the FU survey, comparing the results of the 2 sets of association measures: this would be a quite strong way of validating the models.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

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