Reviewer's report

**Title:** Education-related differences in physical performance after age 60: a cross-sectional study assessing variation by age, gender and occupation

**Version:** 2 Date: 4 March 2013

**Reviewer:** Rachel Cooper

**Reviewer's report:**

This interesting, well written paper examines the associations of educational level with four objective measures of physical performance in a large sample of older people living in Stockholm, Sweden. This study builds on previous studies that have tested the relationships between education and physical performance by investigating differences in association by age, gender and occupation all of which may modify the associations and could explain inconsistencies found in the existing literature.

The research question posed by the authors is well defined and they clearly acknowledge the previous work upon which they are building in addressing this question. The methods appear to be appropriate and are well described and the data appear to be sound. The discussion and conclusions are well balanced and adequately supported by the data and the limitations of the work have been considered. The title and abstract convey what has been found and the writing is acceptable.

**Major compulsory revisions**

1) As the associations of education and physical performance are tested with adjustments and then stratified by age, gender and occupation (or a combination of these) it is quite difficult to follow what the main results show and which of the results readers should give most attention to in deciding how to interpret the study findings. While a major strength of this work is that these interactions have been explored it would be helpful if the authors could find a way to present their findings in a way that makes it slightly easier for readers to follow. This is important as I assume the authors do not want readers to focus too much attention on the results with adjustment (rather than stratification) given not all of these adjustments are fully appropriate because of the evidence of interaction.

**Minor essential revisions**

1) Please make it clear in the abstract whether associations of education with grip strength and chair stands existed prior to adjustment.


3) Please report the method of sample selection prior to reporting the achieved sample size at baseline on page 5. It is confusing to read that the sample consisted of 3363 people at baseline and only then to be told how the sample
were selected (and this made me wonder whether there were two different samples until I reread the paragraph).

4) Please indicate whether the balance test was completed with eyes open or closed.

5) Please could the authors provide justification for the choice of 80 years as a cut-point when testing interactions with age.

6) Please indicate in the footnote of table 1 whether imputed values for physical performance are included and for how many participants.

7) In table 2, please make it clearer whether each model includes adjustment for all variables listed above or for just the specified variable and demographics. It is currently unclear what adjustments are included in each model presented.

Discretionary revisions

1) It is important not to place too much emphasis on statistical significance (Sterne & Davey Smith, BMJ 2001;322:226-31) it would therefore be useful if the authors could avoid referring to results as significant. If they do wish to continue referring to their results in this way they should make it clear that they are referring to statistical significance.

2) It would be helpful to readers if the authors could elaborate on the statement in the introduction ‘The education-related differences in physical performance may differ between the younger-old and the oldest-old and between men and women’ by briefly indicating why these associations might be expected to differ by age and gender. The references cited in this paragraph provide evidence of age and gender differences in similar associations but do not provide any indication of likely explanations.

3) It seems possible that strenuousness of work could be both beneficial and detrimental. People undertaking strenuous manual work will be undertaking lots of occupation-related activity which could be beneficial for physical performance however, they are more likely to acquire occupation-related injuries and accumulate damage to their musculoskeletal system over time which could have long-term detrimental effects on physical performance. It is unclear in the penultimate paragraph of the introduction what effect the authors believe strenuous manual work may have on the associations of interest and so it would be helpful if this could be clarified.

4) Are reasons that participants refused to participate in specific tests known? Were sensitivity analyses conducted in which these participants were excluded to check that the assumption that they had low performance was fair?

5) Please consider reporting how those study participants who received a home visit differed from those who attended the research centre. This is especially important for grip strength assessment given this test was not assessed during home visits and so has been imputed for these people.
6) Did the authors test for differences in findings between the two groups of participants who walked different distances in their walking speed assessment? Did the authors also test whether there were similar findings when using first or average balance time rather than best time?

7) The authors should consider that differences in findings by age could be explained by differential survival effects; those people aged 80+ of lower education probably have had to be more physically robust to reach age 80+ than those people of higher education (because of higher premature mortality rates among people of lower education).

**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.