Author's response to reviews

Title: Environmental barriers, person-environment fit and mortality among community-dwelling very old people

Authors:

Merja Rantakokko (merja.rantakokko@jyu.fi)
Timo Törmäkangas (timo.tormakangas@jyu.fi)
Taina Rantanen (taina.rantanen@jyu.fi)
Maria Haak (maria.haak@med.lu.se)
Susanne Iwarsson (Susanne.iwarsson@med.lu.se)

Version: 3 Date: 5 August 2013

Author's response to reviews: see over
Dear Editor,

We appreciate the opportunity to resubmit our manuscript to BMC Public Health and we want to thank the reviewer for the valuable and constructive comments which helped us to improve the quality of our manuscript. We have copy pasted and numbered the original questions and give responses to the reviewer questions and comments below.

We look forward to your decision on our submission.

Sincerely,

Merja Rantakokko
Gerontology Research Center and Department of Health Sciences
University of Jyväskylä
Finland
Reviewer Dr. Margaret G. Stineman

1. The weighted barrier analysis is based on the sample specific prevalence of functional limitations in relationship to the occurrence of environmental barriers. The barrier item-specific P-E fit score does not appear to be specific to the individual’s particular functional status and abilities. Because the measure does not appear to be person-specific some barriers important to one person may not be important to others rendering the meaningful interpretation of a raw count difficult. This lack of person-specific P-E fit needs to be clarified and acknowledged. If I have interpreted the measure correctly this should be addressed as a limitation.

[R]: We agree on this and have clarified the P-E fit problems to be sample specific throughout the text. We have also added this as a possible limitation as follows (p. 13-14): “Well aware of the limitations of using the number of environmental barriers variable, in order to make more of the importance of the type of environmental barriers rather than count we also utilized the weighted environmental barrier function available in the HE software. However, it should be noted that since the weighted barrier analysis is based on the sample-specific prevalence of functional limitations in relationship to the occurrence of environmental barriers, the barrier item-specific P-E fit score is not specific to the individual’s particular functional status and abilities. That is, some environmental barriers important to one person may not be important to others rendering the meaningful interpretation potentially challenging. More specific analyses require additional in-depth descriptive analyses [40], being beyond the scope of the present study. “

2. The authors report an interesting unexpected finding i.e that the presence of a higher number of indoor barriers showed a slightly protective effect on mortality. You provide a number of possible explanations for this finding. Use of population-determined rather than person-specific P-E fit might be another major explanation. As for example a narrow doorway will not be a problem for a person who uses a wheelchair or possibly other mobility equipment but not for a low vision person. The raw count will have a great deal of noise in it with regard to its relevancy at the individual level of analysis.

[R]: For the number of environmental barriers we included all assessed environmental features, not only those generating P-E fit problems in the study sample. It includes several
items and thus the variable may be too rough. We agree on your comment and have now added to the discussion (p.13): “It might also be that the variable used is too coarse, since the mere number of environmental barriers is not at all related to the functional capacity of the individual. Also, given the large total number of items for the indoor section of the HE, the actual composition of barriers making up the sum score for each case varies substantially within the sample. However, we should not rule out the possibility that environmental barriers may maintain the functioning and health of older people by providing physical exercise as integral part of their daily activities, but since few of the indoor environmental barriers assessed by means of the HE are likely to present challenges of that type, we would prefer to refrain from drawing such a conclusion solely on the basis of this study.” See also the answer to the question 1.

3. The authors note correctly that health differences might be the strongest explanation. The statement as appears in the discussion that the model was adjusted for “the most meaningful health differences” does not appear justified. The variable list includes depressive symptoms, cognitive function, functional limitations and use of mobility devices. Health conditions known to be highly associated with mortality such as cancer, cardiovascular disease and diabetes are not included in the model. Thus the explanation of residual founding from non-measured health conditions remains one of the most important explanations of findings.

[R]: We have now clarified the text and acknowledge this. We have added to the discussion p.13: “There might be several reasons behind the unexpected finding that a higher number of indoor environmental barriers showed a slightly protective effect on mortality. The most likely explanation would have been health differences, and we did adjust the models for several meaningful health differences. However, it should be noted that since we did not adjust for the influence of diagnoses highly associated with mortality, the residual confounding from conditions such as cancer, cardiovascular diseases, diabetes, etc., is an important explanation.”

**Discretionary Revisions**

More might be made of the importance of the type, or profile of barriers rather than count. Risk of falling may be an important risk factor linked to lack of hand rails as well as to high shelves.
R: This is a very good comment and we have added some reflections regarding fall risks and mortality in the Discussion. However, further analyses into this topic are beyond the scope of the present study, but form an interesting target for future research.

Additional modifications to clarify the content of the manuscript:
- Text in the result section concerning Bonferroni corrected results is further optimized, including clarifying footnote to Table 4.
- Due to addition of two references (numbers 35 and 40), the reference list and the references in the text are updated.