Author’s response to reviews

Title: Does being physically active prevent future disability in older people? Attenuated effects when taking time-dependent confounders into account

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Dear editor

Thank you for letting us revise our manuscript entitled “Does being physically active prevent future disability in older people? Attenuated effects when taking time-dependent confounders into account”.

We have changed the naming of the subjects from “elderly” to “older people” and agree that this is more appropriate.

Orthographic errors have also been addressed.

The reviewer asks an important question in respect to whether or not transiting to (instrumental) disability is in fact “the end”? It is in this analysis – not because we do not believe that there is no room for recovery, but simply because the study design of LADIS was to detect transition as its outcome: there is no reliable data available in respect to changes in measures of disability after transition, which is unfortunate.

Note, however: Marginal structural models as such are agnostic to what type of outcome one wants to investigate. In our specific case it was an analogy of survival analysis. Yet it is just as
possible to set up a repeated measures analysis, where the outcome varies from time-point to time-point (see: Hernán MA, Brumback BA, Robins JM. Estimating the causal effect of zidovudine on CD4 count with a marginal structural model for repeated measures. Stat Med. 2002;21: 1689–1709.; somewhat difficult to read mathematical piece). We discussed this possibility in the “Supporting information”.

Perhaps of interest and in respect to what Gill et al. have written: In a separate analysis (not published yet), using the same data as in the manuscript submitted here, but looking at how walking speeds change from year to year, we can show that older people are far more variable year-in, year-out (including recovery) than what is commonly assumed for the non-aged. In this case one could run a similar analysis as above and be able to estimate the effects of e.g. physical activity (treatment) on changes in walking speed (as a time-varying outcome), while accounting for time-varying confounding: Tedious, but feasible.

With my best regards – in the name of my co-authors

Stefan Kreisel