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Does age modify the association between physical work demands and deterioration of self-rated general health?<sup>1</sup>

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- 1 Supplementary material
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## Sensitivity analyses of the two items constituting the variable 'Demanding body postures'

Supplementary Table A. Five-year deterioration of SRH 8 318 observations from 5 204 Danish employees \* without poor health at the baselines 1990-2005 by levels of sitting and squatting and kneeling by gender . Rate Ratios (RR)

|       |  | New cases of<br>poor SRH at<br>follow-up<br>observed % | N     | RR** | 95% CI    |
|-------|--|--|-------|------|-----------|
| Men   | Sitting up to approx. ¼ of working hours                           |  | 2 172 | 1.46 | 1.22-1.73 |
|       | Sitting at least approx. 1/2 of working hours                      | 9  | 2 208 | 1    |           |
| Women | Sitting up to approx. ¼ of working hours                           | 14   | 1 784 | 1.67 | 1.39-2.00 |
|       | Sitting at least approx. 1/2 of working hours                      | 8  | 2 143 | 1    |           |
|       |  |  |       |      |           |
| Men   | Squatting/kneeling at least approx. $\frac{1}{2}$ of working hours | 14   | 246   | 1.52 | 1.11-2.07 |
|       | Squatting/kneeling up to approx. ¼ of working hours                | 10   | 4 136 | 1    |           |
| Women | Squatting/kneeling at least approx. $\frac{1}{2}$ of working hours | 14   | 159   | 1.48 | 1.01-2.16 |
|       | Squatting/kneeling up to approx. ¼ of working hours                | 10   | 3 772 | 1    |           |

Bold numbers denote significant RR's.

\*Men aged 18-59 years, women aged 18-54 years. Regarding the gender specific upper age cut points, see population subsection in the Methods section. \*\*Controlled for age.

## Sensitivity analysis of interaction between age and demanding body postures including also employees with poor SRH in the baselines

| Supplementary Table B. Five-year deterioration of SRH. 9 340 observations from |
|--|
| 5 616 Danish employees* at the baselines 1990-2005 by combinations of          |
| demanding body postures and age group. Odds Ratios (OR)                        |

|       |           |        |       | Prevalenc |      |           |              |            |
|-------|-----------|--------|-------|-----------|------|-----------|--------------|------------|
|       |           |        |       | e of poor |      |           | RERI≠        |            |
|       |           |        |       | SRH at    |      |           | (Relative    |            |
|       | Demanding | Age    |       | follow-up |      |           | Excess       |            |
|       | body      | group, |       | observed  |      |           | Risk due to  |            |
|       | postures§ | yrs    | N     | %         | OR** | 95% CI    | Interaction) | 95% CI low |
| Men   |           |        |       |           |      |           |              |            |
|       | No        | 18-32  | 1 026 | 9%        | 1    |           |              |            |
|       | Yes       | 18-32  | 813   | 9%        | 0.83 | 0.59-1.15 |              |            |
|       | No        | 22 42  | 4 000 | 4.40/     | 1 11 | 1 04 1 90 |              |            |
|       | NU        | 33-43  | 1 039 | 14%       | 1.41 | 1.04-1.09 |              |            |
|       | Yes       | 33-43  | 461   | 21%       | 1.88 | 1.34-2.63 | 0.65         | 0.08-1.22  |
|       | No        | 44-59  | 1 127 | 17%       | 1.82 | 1.37-2.41 |              |            |
|       | Yes       | 44-59  | 436   | 29%       | 2.33 | 1.68-3.22 | 0.68         | 0.02-1,34  |
| Women |           |        |       |           |      |           |              |            |
|       |           |        |       |           |      |           |              |            |
|       | No        | 18-32  | 1 054 | 8%        | 1    |           |              |            |
|       |           |        |       |           |      |           |              |            |
|       | Yes       | 18-32  | 535   | 12%       | 1.11 | 0.79-1.59 |              |            |
|       | No        | 33-43  | 1 083 | 12%       | 1.48 | 1.10-1.99 |              |            |
|       |           |        |       |           |      |           |              |            |
|       | Yes       | 33-43  | 465   | 22%       | 2.11 | 1.49-3.00 | 0.51         | -0.17-1.20 |
|       | No        | 44-54  | 872   | 18%       | 2.03 | 1.51-2.74 |              |            |
|       | Yes       | 44-54  | 429   | 33%       | 3.47 | 2.49-4.83 | 1.33         | 0.36-2.29  |

Bold numbers denote significant RR's.

Baseline data from 1990, 1995, 2000, 2005 and follow-up data from 1995, 2000, 2005, 2010.

\*Men aged 18-59 years, women aged 18-54 years. Regarding the gender specific upper age cut points, see population subsection in the Methods section. \*\*Controlled for baseline: poor SRH, job control (influence and possibilities for development) and social class. Odds ratios instead of rate ratios were estimated due to small cells among women; the RR estimation method (link=log) does not work with small cells (1).

‡Relative excess risk due to interaction= [RR (poor physical work demands & higher age)-1] - [RR (poor physical work demands & lower age)-1] - [RR (good physical work demands & higher age)-1]. Here, as it is sometimes the case, OR is used as a proxy for RR (2, 3).

## Sensitivity analysis of interaction between age and demanding body postures treating age, demanding body postures and SRH as continuous variables

Supplementary Table C. Five-year deterioration of SRH\*. 8 318 observations from 5 204 Danish employees\*\* without poor health<sup>‡</sup> at the baselines 1990-2005 by demanding body postures, age and interaction of demanding body postures with age. Betas

|       |  | Р    | Beta <sup>#</sup> | 95% CI |
|-------|--|------|-------------------|--------|
| Men   | Age  | .000 | .11               | .0814  |
|       | Demanding body postures                        | .387 | .01               | 0205   |
|       | Interaction of age and demanding body postures | .022 | .03               | .0006  |
| Women | Age  | .000 | .14               | .1117  |
|       | Demanding body postures                        | .000 | .08               | .0512  |
|       | Interaction of age and demanding body postures | .000 | .06               | .0209  |

Bold numbers denote significant Betas.

Baseline data from 1990, 1995, 2000, 2005 and follow-up data from 1995, 2000, 2005, 2010.

In this linear regression, age (continuously) and the scale demanding body postures (see description of the scale in the variables subsection of the method section) were treated as linear variables. They were centered to the mean and transformed so that their standard deviations were equal to 1. These transformations were required in order to assess interaction.

\*Highest value denote 'poor health', lowest value denote 'good health'.

\*\*Men aged 18-59 years, women aged 18-54 years. Regarding the gender specific upper age cut points, see population subsection in the Methods section.

‡1.e. employees without baseline poor SRH, i.e. poor comprising the categories 'fairly good', 'poor' and 'very poor'.
‡1Beta for SRH at follow-up. Adjusted for baseline SRH ('very good' or 'good'), job control (influence and possibilities for development) and social class.

## References

 Skov T, Deddens J, Petersen M, Endahl L. Prevalence proportion ratios: estimation and hypothesis testing. International journal of epidemiology. 1998;27(1):91-5.
 Andersson T, Alfredsson L, Källberg H, Zdravkovic S, Ahlbom A. Calculating measures of biological interaction. European Journal of Epidemiology. 2005;20(7):575-9.
 Andersson T, Alfredsson L, Källberg H, Zdravkovic S, Ahlbom A. Excel sheet to calculate measures of biological interaction http://www.epinet.se/Epidemiologicaltools.htm2005