Self-reported vs. device-measured sitting time: the HUNT4 Study

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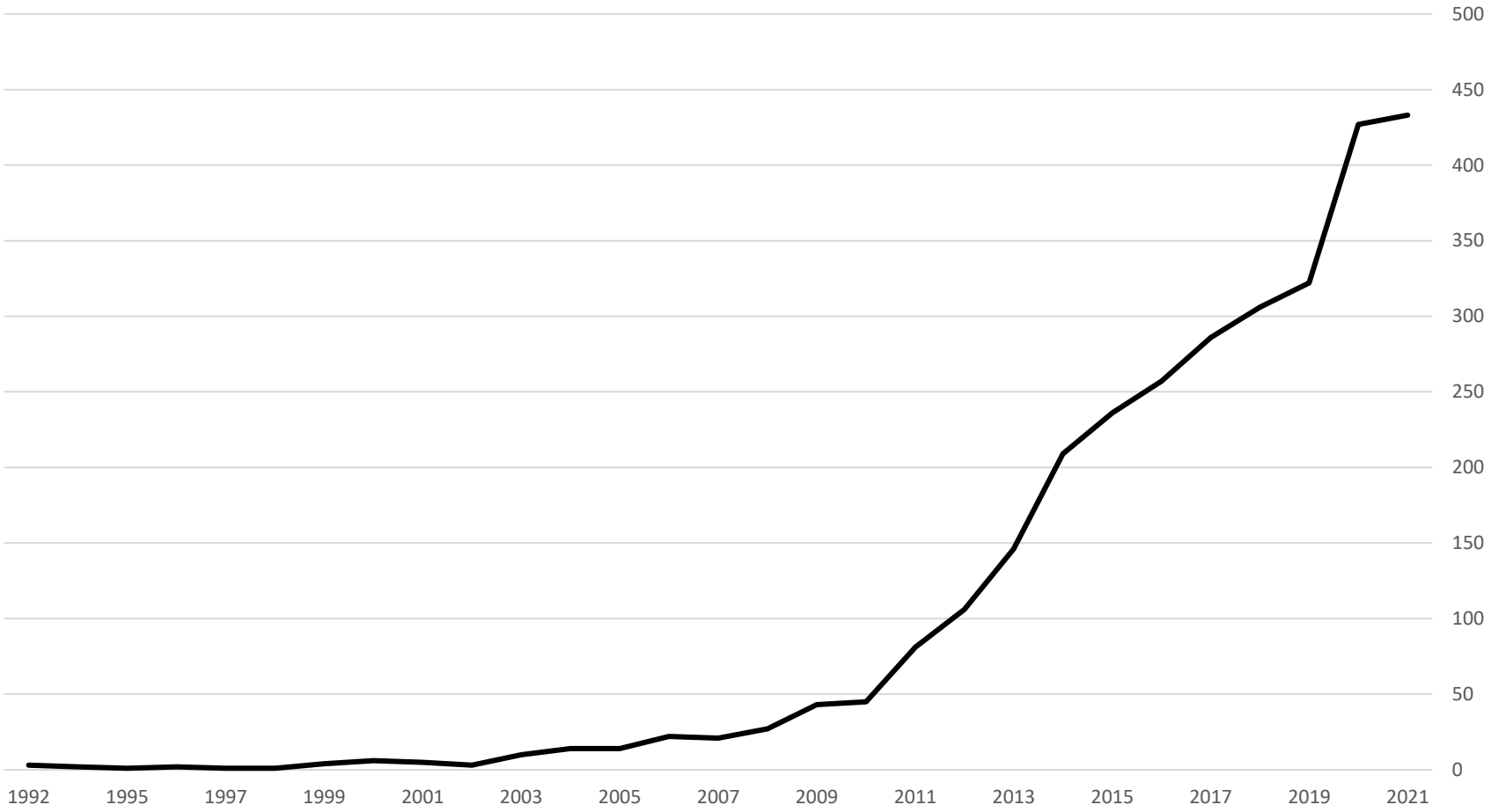
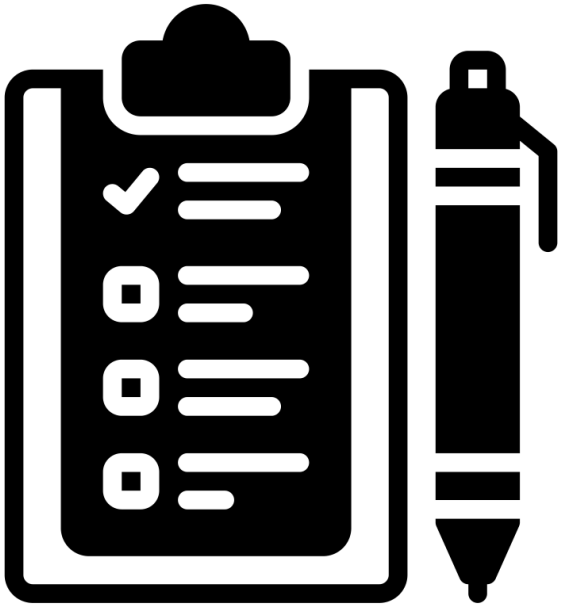
Search results "Sedentary behaviour" in PubMed



Most research on sitting time done with self-reports



Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonised meta-analysis of data from more than 1 million men and women

Ulf Ekelund, Jostein Steene-Johannessen, Wendy J Brown, Morten Wang Fagerland, Neville Owen, Kenneth E Powell, Adrian Bauman, I-Min Lee, for the Lancet Physical Activity Series 2 Executive Committe and the Lancet Sedentary Behaviour Working Group**

Well known that self-reports underestimate sitting time

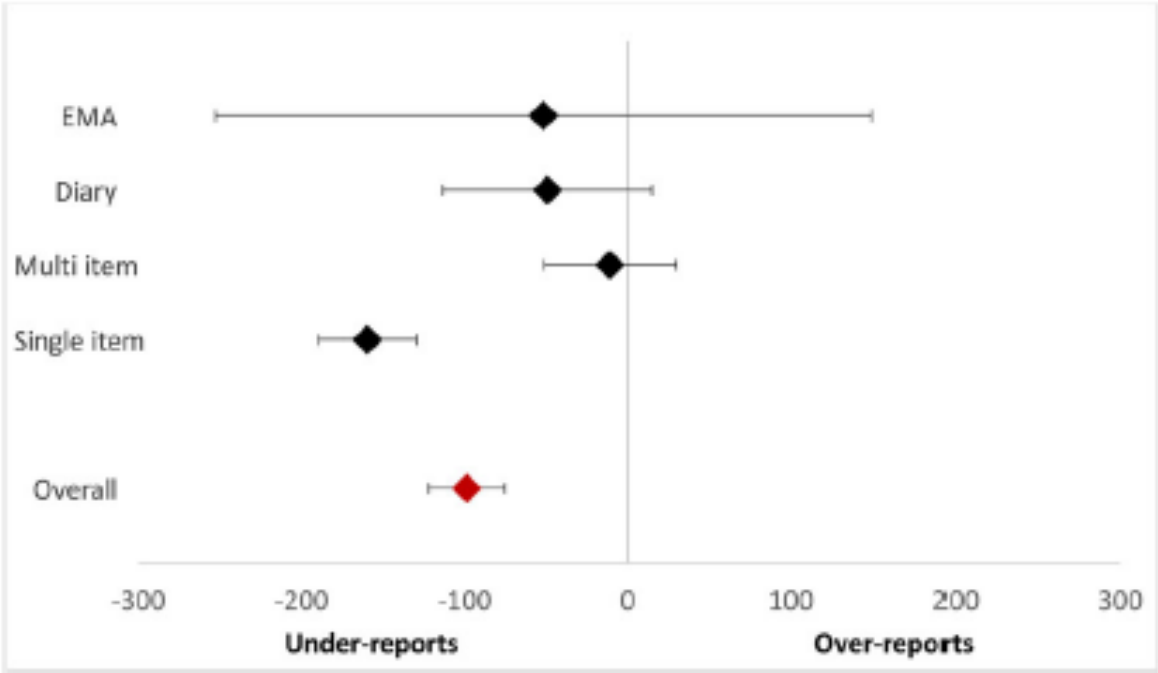


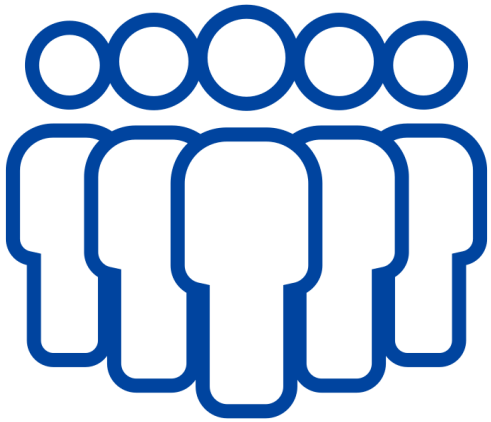
Fig. 3 Summary forest plot comparing self-report and device measures of total sedentary or sitting time between single vs. multi-item vs. EMAs vs. diaries/logs, minutes/day

Prince, S.A., Cardilli, L., Reed, J.L. *et al.* A comparison of self-reported and device measured sedentary behaviour in adults: a systematic review and meta-analysis. *Int J Behav Nutr Phys Act* **17,** 31 (2020).

Factors known to cause differential bias

- Age and low-back pain (Gupta et al. 2018)
- Age and body mass index in PA (Wick et al. 2016)

Both studies conducted on blue collar workers



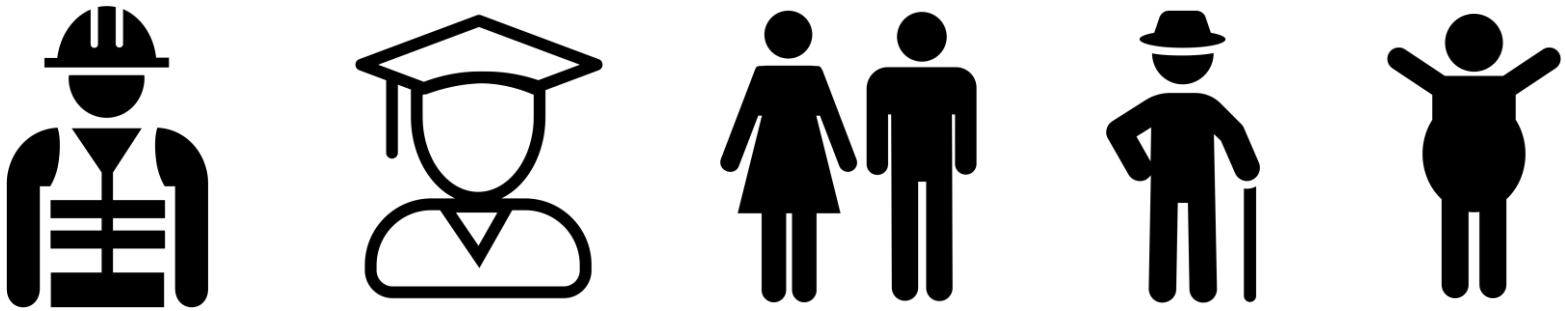
- Less known about general population

Gupta N, Heiden M, Mathiassen SE, Holtermann A. Is self-reported time spent sedentary and in physical activity differentially biased by age, gender, body mass index, and low-back pain? Scand J Work Environ Health. 2018 Mar 1;44(2):163-170.

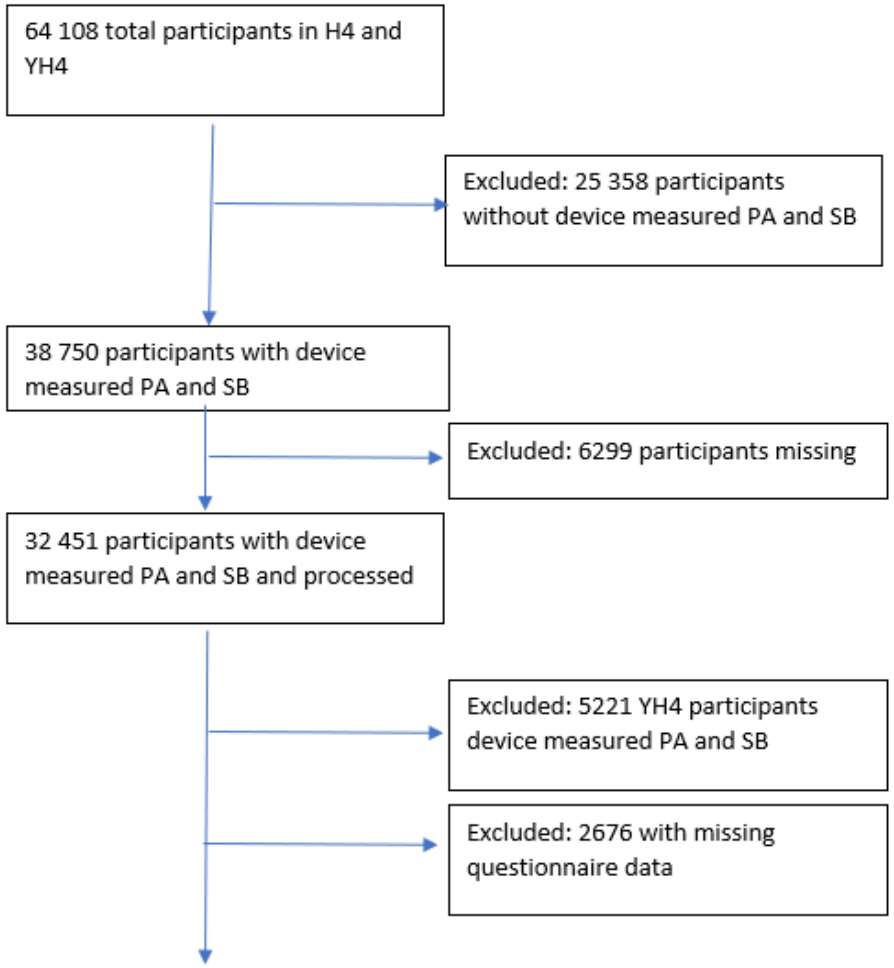
Wick K, Faude O, Schwager S, Zahner L, Donath L. Deviation between self-reported and measured occupational physical activity levels in office employees: effects of age and body composition. Int Arch Occup Environ Health. 2016 May;89(4):575-82.

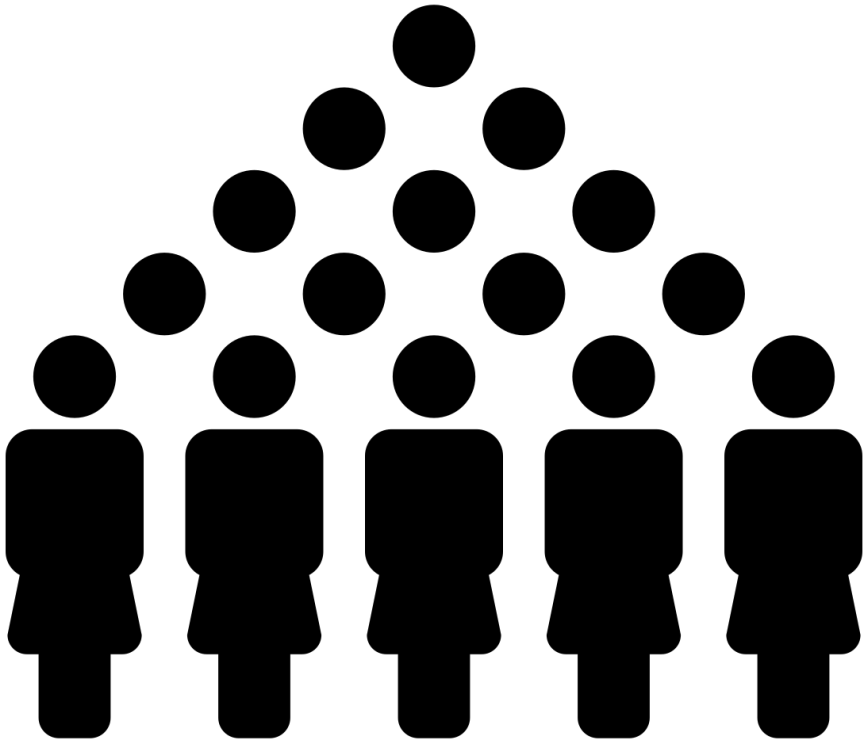
Research question

«What factors are associated with a diffferential bias between self-reported and device-measured sitting time in a general poopulation?»



Participants



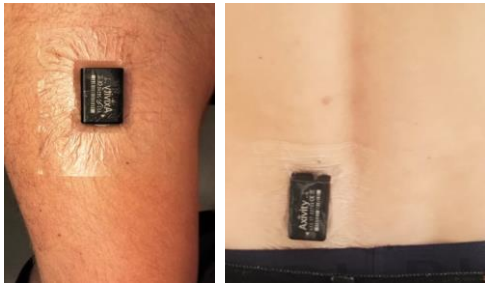


Final sample of 24 554 participants

Mean wear-time: 3.83 weekdays

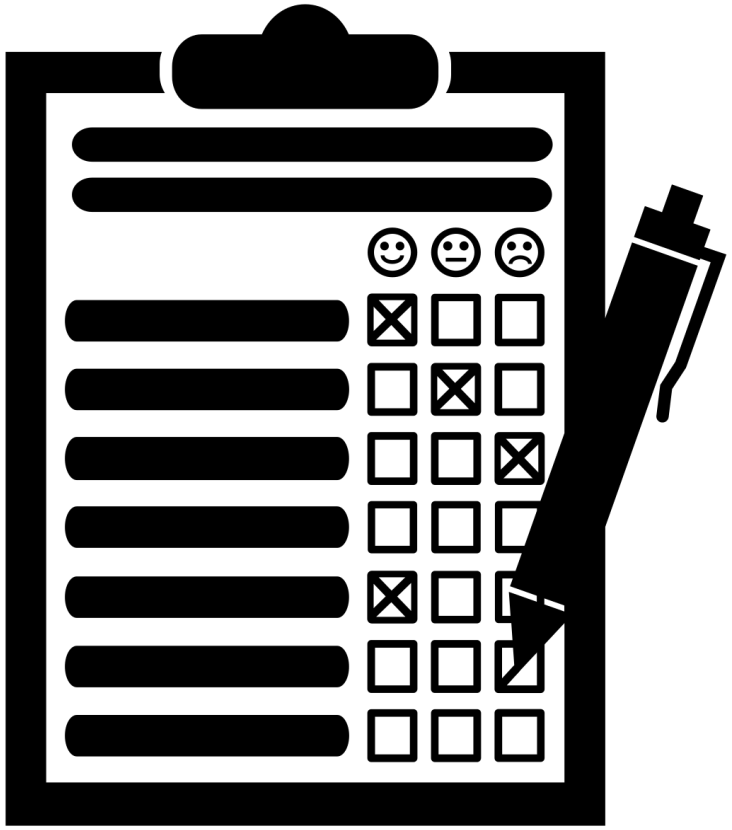
Device measured sitting time

- Two sensors
  - One on the thigh, 10 cm above upper patella
  - One on the lower back (L3)
- Participants asked to wear the sensors for a week
- Machine learning model developed to predict lying, sitting, standing, walking, running and cycling.

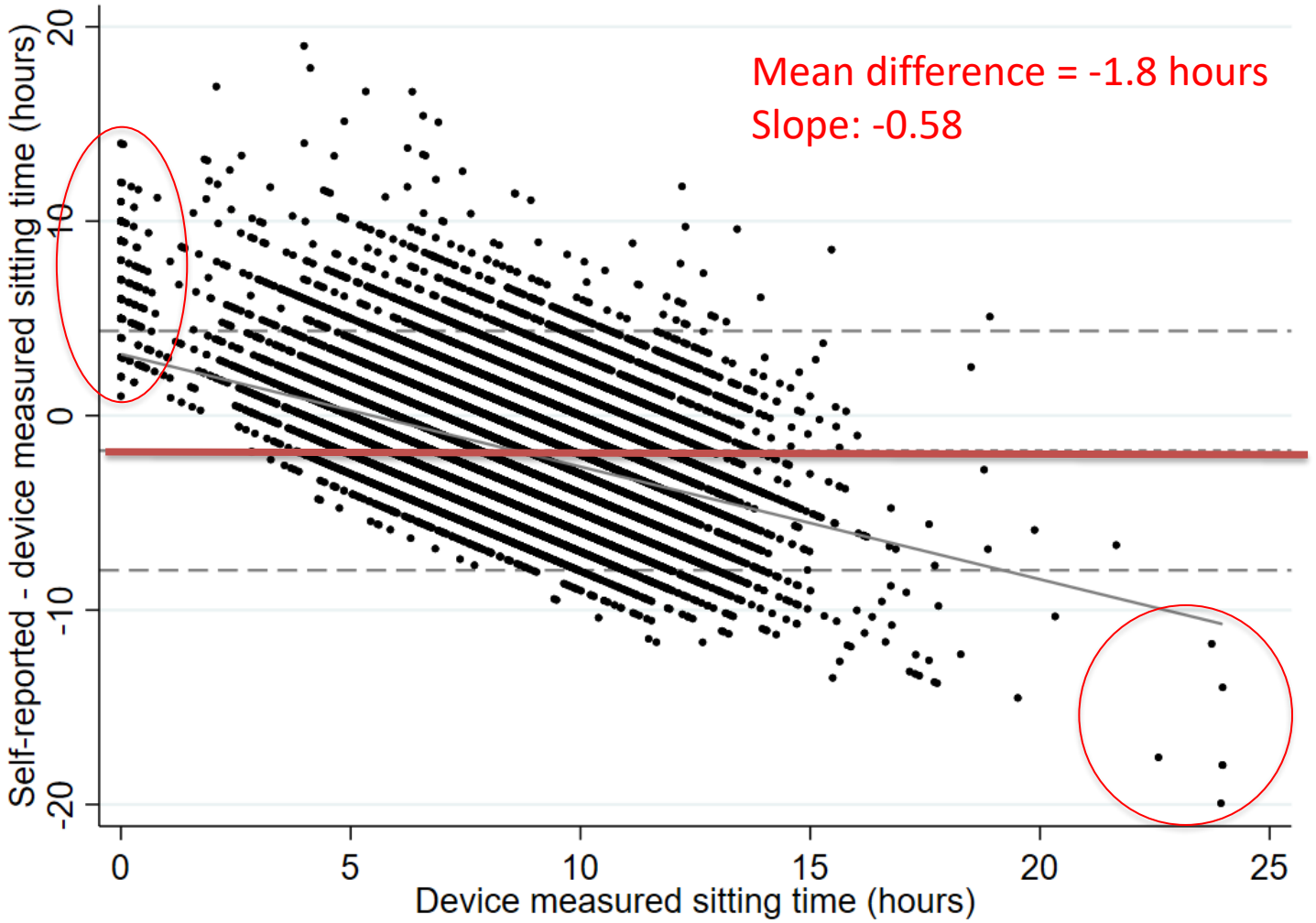


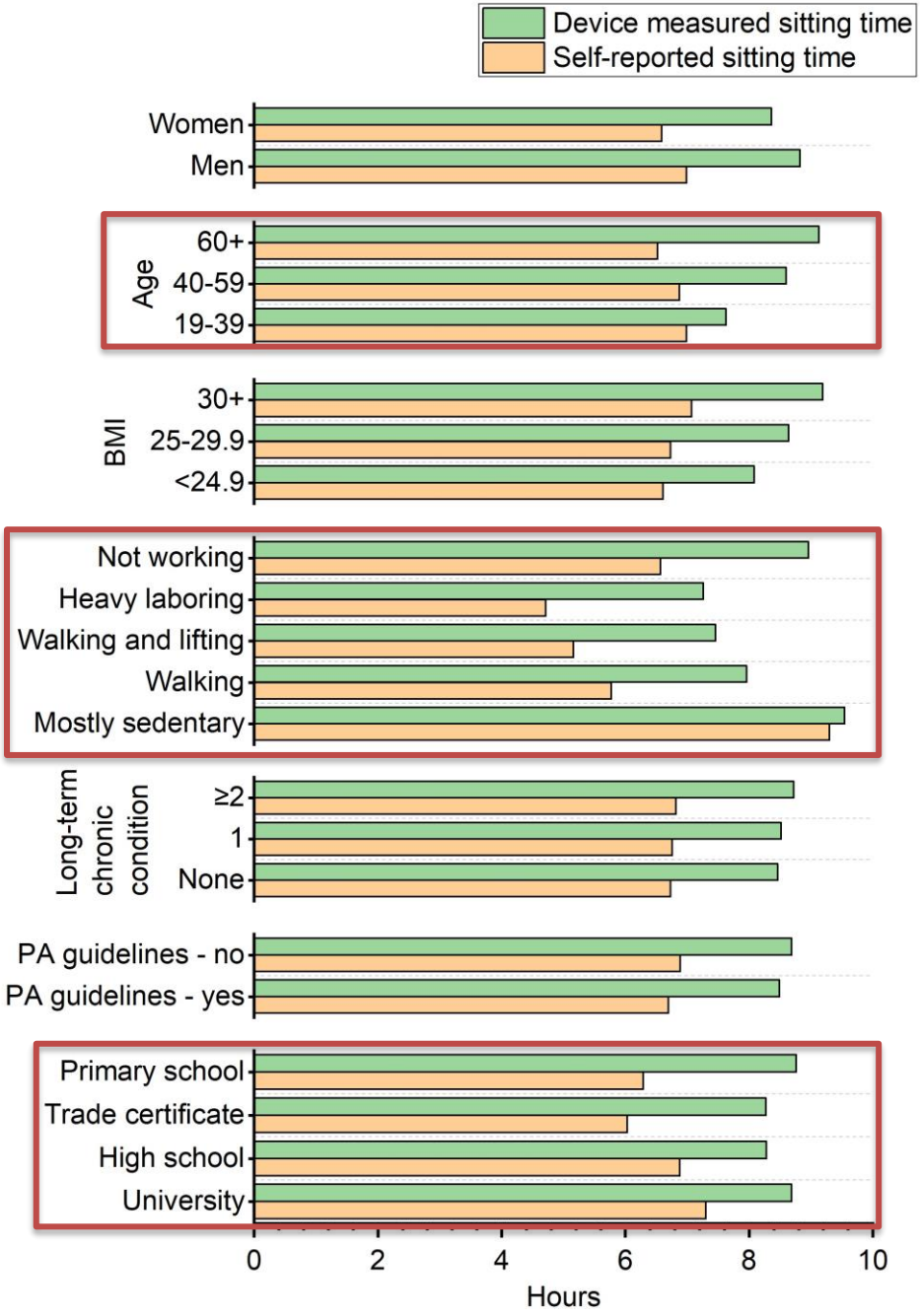
Self-reported sitting time

*“Approximately how many hours do you spend sitting on a **normal weekday**? Include both work and leisure time”*



Results


Mean difference = -1.8 hours
Slope: -0.58
Self-reported - device measured sitting time (hours)
20
10
0
-10
-20
0
5
10
15
20
25
Device measured sitting time (hours)


Device measured sitting time
Self-reported sitting time
Women
Men
Age
60+
40-59
19-39
BMI
30+
25-29.9
<24.9
Not working
Heavy laboring
Walking and lifting
Walking
Mostly sedentary
Long-term chronic condition
≥2
1
None
PA guidelines - no
PA guidelines - yes
Primary school
Trade certificate
High school
University
0
2
4
6
8
10
Hours

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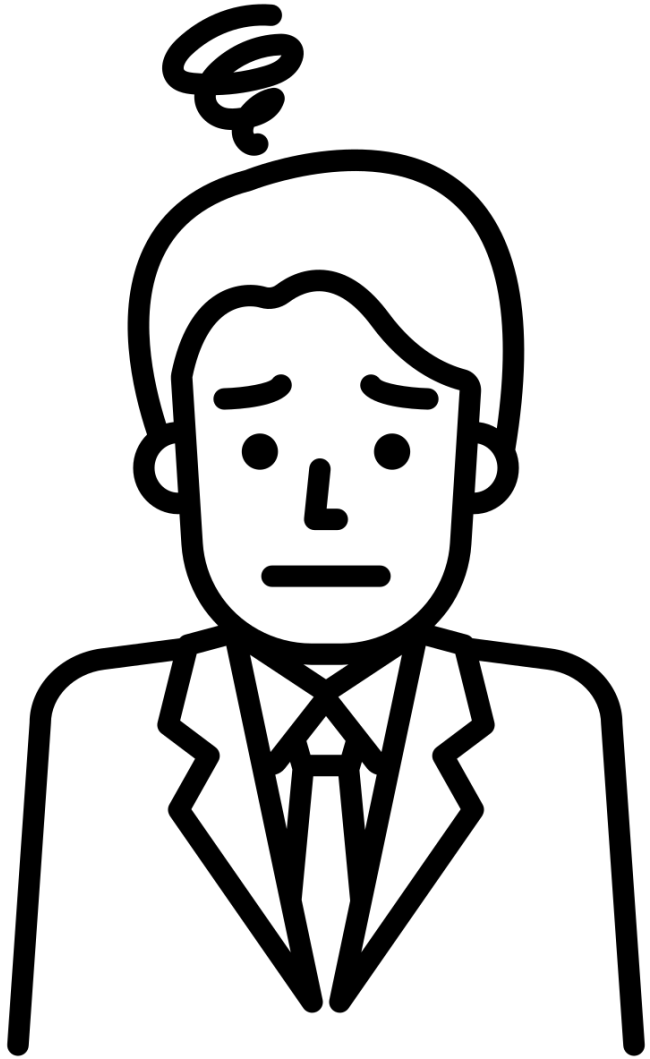
Self-report vs. device-measured sitting time in minutes

	N	Mean device-measured sitting time (minutes)	Mean difference (minutes)	Age-adjusted mean difference (95% CI)
Sex				
Men	10990	529	0	0 (Ref.)
Women	13564	502	3	-5 (-10 to -0)
Age category				
19-39	5928	458	0	
40-59	9419	516	-65	
60+	9207	548	-118	
BMI category				
<24.9	8622	485	0	0 (Ref.)
25-29.9	10447	518	-26	-11 (-16 to -5)
30+	5393	551	-39	-26 (-32 to -20)
Work demands				
Mostly sedentary	5944	572	0	0 (Ref.)
Walking	4972	478	-117	-122 (-128 to -115)
Walking and lifting	4380	448	-124	-137 (-144 to -131)
Heavy labor	934	436	-139	-149 (-161 to -137)
Not working	8071	538	-129	-70 (-76 to -64)
Education				
University	11112	521	0	0 (Ref.)
High school	2994	497	-1	-13 (-20 to -5)
Trade certificate	5138	496	-52	-49 (-55 to -43)
Primary school	5265	526	-65	-32 (-38 to -26)
LTC				
None	8646	508	0	0 (Ref.)
1	7382	511	-2	5 (-0.0 to 11)
2 or more	8499	523	-10	9 (3 to 14)
PA guidelines				
Yes	14608	509	0	0 (Ref.)
No	9760	521	-1	-5 (-10 to -1)

Conclusion

- In general, people underestimate their sitting time by almost 2 hours.
- Age, work and education are associated with a differential bias between device-measured and self-reported sitting time



Thank you for your attention!