## Patterns and changes of 24-h movement behavior Results from the Finnish Retirement and Aging study

Sari Stenholm

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# Outline

- Introducing FIREA study
- Activity domains
- Patterns and heterogeneity
- Temporal changes, CoDA
- Ongoing & upcoming research







# Finnish Retirement and Aging Study (FIREA)

- People working in municipalities, mean age 63 years at baseline
- Wide range on occupations
- Survey cohort (n=6700), activity sub-study (n=1200)
- 4-5 annual measurements

1-week measurement with wActiSleep-BT or wGT3X-BT:

- Non-dominant wrist
- Sleep: ActiGraph algorithm
- Non-wear: Choi algorithm
- Total activity: counts
- Activity intensities: GGIR





# Measurement of movement behavior

ActiGraph (accelerometer)



Axivity (accelerometer)

SenseDoc (GPS and accelerometer)

















## Physical Activity across Retirement Transition by Occupation and Mode of Commute

ANNA PULAKKA<sup>1,2,3</sup>, TUIJA LESKINEN<sup>1,2</sup>, KRISTIN SUORSA<sup>1,2</sup>, JAANA PENTTI<sup>1,2,4</sup>, JAANA I. HALONEN<sup>3,5</sup>, JUSSI VAHTERA<sup>1,2</sup>, and SARI STENHOLM<sup>1,2</sup>

Med. Sci. Sports Exerc., Vol. 52, No. 9, pp. 1900-1907, 2020.





# Distribution of activity volume by domains (Pulakka et al. 2020 Med Sci Sports Exerc)





Work: 25 to 30% Commuting: 5% Leisure time: 65 to 70%



# Mode of commute reflects total activity

(Pulakka et al. 2020 Med Sci Sports Exerc)



% of total daily activity accumulated from commuting



% reduction in total daily activity



Adjusted for gender, occupational category, age, and wake wear time.



#### Daily Physical Activity Patterns and Their Association With Health-Related Physical Fitness Among Aging Workers — The Finnish Retirement and Aging Study

Sari Stenholm, PhD,<sup>1,2,\*,</sup> Anna Pulakka, PhD,<sup>3</sup>Tuija Leskinen, PhD,<sup>1,2</sup> Jaana Pentti, BSc,<sup>1,4</sup> Olli J. Heinonen, MD, PhD,<sup>5</sup> Annemarie Koster, PhD,<sup>6</sup> and Jussi Vahtera, MD, PhD<sup>1,2,0</sup>





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#### Average total daily activity

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## Activity patterns vs. health-related physical fitness (Stenholm et al. 2021 JGMS)



smoking, and alcohol risk use.

Lowest fat mass and low waist

RFΔ

Best cardiorespiratory fitness and push-up test

Low fat mass and lowest waist

Highest fat mass and waist

## Physical fitness is important for work ability (Suorsa et al. 2022 Eur J Ageing)





Moderate work ability Good work ability Excellent work ability

Adjusted for age, gender and occupational status.





## Compositional data analysis to examine changes during retirement transition

- CoDA provides statistical tool to analyze multivariate proportion-type data such as the 24-hour time use.
- Retirement is associated with changes in physical activity, sedentary time and sleep, but how the distribution changes is unknown.
- Important to consider gender and occupation.









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## **FIREA** research group

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#### Collaborators

Prof. Seb Chastin A/prof. Annemarie Koster Dr. Nidhi Gupta Dr. Peter Johansson Dr. Pasan Hettiarachchi





Education and Culture

### **Contact:**

sari.stenholm@utu.fi @SariStenholm

## More information:

www.utu.fi/firea







