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*Publication date:*  
2014

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Matthiessen, J., Andersen, E. W., Raustorp, A., & Sørensen, M. R. (2014). Trends in pedometer-measured steps per day in Danish adults: 2007 to 2012. Poster session presented at International Society for Behavioral Nutrition and Physical Activity 2014, San Diego, United States.

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# Trends in pedometer-measured steps per day in Danish adults: 2007 to 2012



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**Introduction** Objective measurements of physical activity have been lacking in Denmark. Therefore, little is known about the time trends in the population.

**Purpose** To examine temporal trends from 2007-2008 to 2011-2012 in pedometer-measured physical activity (steps/day) in a nationally representative sample of Danish adults.

## Methods

- The study population comprised a random sample of Danish citizens aged 18-75 years who participated in the Danish National Survey of Diet and Physical Activity (DANSDA) in 2007-2008 (n=224) and 2011-2012 (n=1515).
- Sealed pedometer data (Yamax SW-200) were obtained for seven consecutive days.
- A total of 1624 participants (48.2% men) met the inclusion criteria, i.e. at least four valid days of data ( $\geq 10$  h/d).
- Regression models adjusted for sex, age, education and season were used to analyse data.

**Table 1.** Steps/day and percentages of active and sedentary adults (mean (95% CI)), DANSDA 2007-2008 (n=202) and 2011-2012 (n=1408)

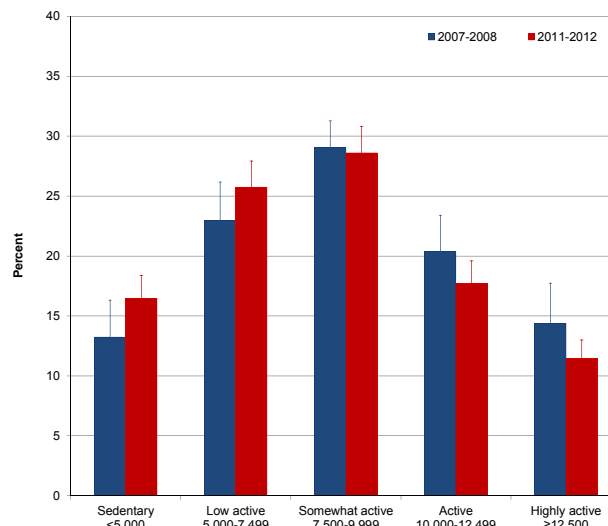
|                                      | All                   |                      | Men                   |                       | Women                  |                                    |
|--------------------------------------|-----------------------|----------------------|-----------------------|-----------------------|------------------------|------------------------------------|
|                                      | 2007-2008             | 2011-2012            | 2007-2008             | 2011-2012             | 2007-2008              | 2011-2012                          |
| Steps/day                            | 8788<br>(8321; 9254)  | 8341<br>(8160; 8523) | 8648<br>(8015; 9280)  | 8521<br>(8262; 8780)  | 8968<br>(8291; 9645)   | 8164 <sup>*</sup><br>(7920; 8408)  |
| $\geq 10,000$ steps/day (%)          | 34.8<br>(28.3; 41.3)  | 29.3<br>(26.9; 31.7) | 27.0<br>(23.8; 30.2)  | 31.7<br>(28.1; 35.2)  | 39.8<br>(30.2; 49.5)   | 30.5 <sup>**</sup><br>(22.0; 39.1) |
| < 5,000 steps/day (%)                | 14.2<br>(9.2; 19.1)   | 16.4<br>(14.4; 18.4) | 17.6<br>(14.8; 20.3)  | 15.3<br>(12.5; 18.0)  | 13.1<br>(6.1; 20.1)    | 14.9<br>(8.2; 21.7)                |
| Steps/day incl. cycling <sup>†</sup> | 9892<br>(9307; 10478) | 9583<br>(9355; 9810) | 9327<br>(8533; 10121) | 9705<br>(9381; 10030) | 10546<br>(9697; 11395) | 9468 <sup>*</sup><br>(9162; 9774)  |

\*P<0.05, \*\*P<0.01: Differences between survey periods using regression models

<sup>†</sup>160 step equivalents were added for each minute of cycling<sup>1</sup>

## Results

- In 2011-2012, Danish adults took on average 8341 (95% CI 8160; 8523) steps/day.
- A significant difference was observed between men and women in 2011-2012 (p=0.046). However, when cycling was taken into account no difference between sexes was found (p=0.288).
- Mean steps/day decreased by 446 from 2007-2008 to 2011-2012 (Table 1).
- The proportion taking  $\geq 10,000$  steps/day decreased and proportion taking <5,000 steps/day increased (Figure 1). These changes were primarily due to a reduced level of activity among women as men maintained their activity level (Table 1).



**Figure 1.** Danish adults categorized according to step-defined activity levels<sup>2</sup> in 2007-2008 and 2011-2012

**Conclusion** This nationally representative survey showed a tendency to a decline in daily steps due to a lower level of activity among women. The increased proportion with a sedentary and low active lifestyle is worrying from a public health perspective. Targeted actions should encourage these individuals, especially women, to increase their level of physical activity.

<sup>1</sup> Miller R, Brown WJ, Tudor-Locke C: **But what about swimming and cycling? How to count non-ambulatory activity when using pedometers to assess physical activity.** *J Phys Act Health* 2006, 3:257-266.

<sup>2</sup> Tudor-Locke C, Bassett Jr, DR: **How many steps/day are enough? Preliminary pedometer indices for public health.** *Sports Med* 2004, 34:1-8.

