Work, retirement, and Healthy Life Expectancy

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• Stockholm Stress Center, a FAS centre of excellence
• Department of Psychology, Stockholm University (Division of Work and Organizational Psychology)
• Department of Clinical Neuroscience, Karolinska Institutet (Division of Insurance Medicine)
• Department of Epidemiology & Public Health, University College London (UCL)
Background

• Increased life expectancy
• Large cohorts reaching old age
• Increased number of retirees
• More people live with chronic disease
  – suffering
  – costly treatment
• Possibly more people in dependency

• Not only add years to life, but also life to years
  – compression or expansion of morbidity?
HALE and overall Life Expectancy in Norway

<table>
<thead>
<tr>
<th>Age</th>
<th>Male healthy life expectancy</th>
<th>Female healthy life expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990 (53.2–56.3)</td>
<td>2010 (57.3–60.6)</td>
</tr>
<tr>
<td></td>
<td>60.9 (57.9–60.5)</td>
<td>63.2 (59.4–65.0)</td>
</tr>
<tr>
<td></td>
<td>61.4 (59.6–63.1)</td>
<td>64.6 (62.7–66.3)</td>
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<tr>
<td></td>
<td>58.8 (57.0–60.5)</td>
<td>61.6 (59.7–63.3)</td>
</tr>
<tr>
<td></td>
<td>54.4 (52.6–56.1)</td>
<td>57.0 (55.2–58.7)</td>
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<tr>
<td></td>
<td>50.0 (48.3–51.6)</td>
<td>52.5 (50.8–54.2)</td>
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<tr>
<td></td>
<td>45.8 (44.1–47.3)</td>
<td>48.2 (46.6–49.8)</td>
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<tr>
<td></td>
<td>41.6 (40.1–43.1)</td>
<td>44.1 (42.5–45.6)</td>
</tr>
<tr>
<td></td>
<td>37.6 (36.1–38.9)</td>
<td>40.0 (38.5–41.4)</td>
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<tr>
<td></td>
<td>33.6 (32.2–34.8)</td>
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<td>29.6 (28.4–30.8)</td>
<td>32.0 (30.6–33.2)</td>
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<td></td>
<td>25.8 (24.6–26.9)</td>
<td>28.0 (26.8–29.2)</td>
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<td>22.1 (21.0–23.1)</td>
<td>24.2 (23.1–25.2)</td>
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<td></td>
<td>18.6 (17.6–19.5)</td>
<td>20.5 (19.5–21.5)</td>
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<tr>
<td></td>
<td>15.3 (14.5–16.1)</td>
<td>17.0 (16.1–17.9)</td>
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<tr>
<td></td>
<td>12.3 (11.6–13.0)</td>
<td>13.8 (13.0–14.5)</td>
</tr>
<tr>
<td></td>
<td>9.6 (9.0–10.2)</td>
<td>10.9 (10.2–11.5)</td>
</tr>
<tr>
<td></td>
<td>7.3 (6.8–7.8)</td>
<td>8.3 (7.8–8.9)</td>
</tr>
<tr>
<td></td>
<td>5.3 (4.9–5.7)</td>
<td>6.1 (5.7–6.5)</td>
</tr>
</tbody>
</table>

Data are point estimates (95% uncertainty intervals; years).

Table 1: Global healthy life expectancy by age, in 1990, and 2010

<table>
<thead>
<tr>
<th>Age</th>
<th>Male healthy life expectancy</th>
<th>Female healthy life expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990</td>
<td>2010</td>
</tr>
<tr>
<td>0 years</td>
<td>54.8 (53.2–56.3)</td>
<td>59.0 (57.3–60.6)</td>
</tr>
<tr>
<td>1 years</td>
<td>58.1 (56.3–59.5)</td>
<td>60.7 (58.9–62.3)</td>
</tr>
<tr>
<td>5 years</td>
<td>55.5 (53.8–57.0)</td>
<td>57.7 (55.9–59.3)</td>
</tr>
<tr>
<td>10 years</td>
<td>51.1 (49.5–52.6)</td>
<td>53.2 (51.5–54.8)</td>
</tr>
<tr>
<td>15 years</td>
<td>46.7 (45.2–48.1)</td>
<td>48.7 (47.1–50.2)</td>
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<tr>
<td>20 years</td>
<td>42.5 (41.0–43.8)</td>
<td>44.4 (42.8–45.8)</td>
</tr>
<tr>
<td>25 years</td>
<td>38.4 (36.9–39.6)</td>
<td>40.2 (38.8–41.6)</td>
</tr>
<tr>
<td>30 years</td>
<td>34.3 (33.0–35.5)</td>
<td>36.2 (34.8–37.6)</td>
</tr>
<tr>
<td>35 years</td>
<td>30.3 (29.1–31.5)</td>
<td>32.3 (30.9–33.5)</td>
</tr>
<tr>
<td>40 years</td>
<td>26.5 (25.3–27.5)</td>
<td>28.4 (27.1–29.6)</td>
</tr>
<tr>
<td>45 years</td>
<td>22.7 (21.6–23.7)</td>
<td>24.6 (23.4–25.7)</td>
</tr>
<tr>
<td>50 years</td>
<td>19.2 (18.2–20.1)</td>
<td>21.0 (19.9–22.0)</td>
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<tr>
<td>55 years</td>
<td>15.9 (15.1–16.7)</td>
<td>17.6 (16.6–18.5)</td>
</tr>
<tr>
<td>60 years</td>
<td>13.0 (12.2–13.7)</td>
<td>14.4 (13.6–15.2)</td>
</tr>
<tr>
<td>65 years</td>
<td><strong>10.3 (9.7–10.9)</strong></td>
<td><strong>11.6 (10.8–12.3)</strong></td>
</tr>
<tr>
<td>70 years</td>
<td>8.0 (7.4–8.5)</td>
<td>9.0 (8.4–9.6)</td>
</tr>
<tr>
<td>75 years</td>
<td>6.0 (5.6–6.5)</td>
<td>6.9 (6.4–7.4)</td>
</tr>
<tr>
<td>80 years</td>
<td>4.4 (4.1–4.8)</td>
<td>5.1 (4.7–5.5)</td>
</tr>
</tbody>
</table>

Data are point estimates (95% uncertainty intervals; years).

*Table 1*: Global healthy life expectancy by age, in 1990, and 2010

Per cent in work 55-64 years of age

Source: Eurostat

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Is retirement beneficial or harmful?

- There is a limit to how long people can work
- Retirement could harm the individual’s health through
  - poverty
  - use it or lose it
  - poor health behaviours
  - life loses its meaning
  - work is healthy, so retirement must surely be bad for you?
- Retirement can also be beneficial through
  - liberation from stress and dangerous work
  - rest and recuperation
  - time for meaningful and healthy activities
Earlier research

• Mixed results
  – disability pension associated with poor health
  – involuntary retirement negative according to some studies
  – old age pension – contradictory results
  – faster cognitive decline after retirement

• Large methodological problems
  – difficult separate the effect of retirement from the effect of ageing
  – the older, the more likely a person is to have health problems
  – major selection effects
  – many forced to retire when health fails
  – the most healthy with the best jobs often continue (choose) to work
Self-rated health before and after retirement in France (GAZEL): a cohort study


DOI:10.1016/S0140-6736(09)61570-1
Method

- Study based on the GAZEL cohort
  - yearly questionnaires to 20,625 volunteers since 1989
  - based on the French gas and electricity company
  - 14,714 persons in the analytic sample
- Yearly measurements from a 15-year time window centred on retirement
  - from year -7 through +7
- Self-rated health
  - 8-point Likert scale, dichotomised according to the literature
  - 174,765 person-measurement observations
- Repeated measurements logistic regression with generalised estimating equations (GEE)
  - takes account of intra-individual correlations (ARIMA)
  - not sensitive to missing (MAR) data

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18,884 (92%) retired by 2007.

Of them, all 14,104 participants with ≥1 returned questionnaire before and after retirement, and who had not retired on health grounds (n=610), were selected for the study.
Of those who did not retire due to illness, 10,216 (72%) retired between 53 and 57 years of age, and 13,846 (98%) between the ages of 50 and 60 – at 64 all had retired.
Prevalence of suboptimal self-rated health

Estimated prevalence

Fitted function

Year in relation to retirement

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Psychological demands

Physical demands

Job satisfaction

-1 vs -7
+1 vs. -1
+7 vs. +1
Why is retirement a relief?

• Is work physically and mentally taxing?
  – normal ageing limits certain capacities
  – the prevalence of chronic illnesses increases with age
  – modern working life often demands peak performance
  – age discrimination an added stressor

• Do people experience their health as poor when they feel they cannot perform optimally at work?

• Is retirement beneficial per se?
  – more time for health promoting activities
  – more time to enjoy life

• Do retirees have more opportunities for rest and recuperation?

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Effect of retirement on sleep disturbances: the GAZEL prospective cohort study

Changes in sleep after retirement

P\textsubscript{r}e\textsubscript{v}a\textsubscript{l}e (95\% CI)

/ Jussi Vahtera, M.D., Ph.D., Finnish Institute of Occupational Health & Turku University and University Hospital
Changes in sleep after retirement by risk profile

/ Jussi Vahtera, M.D., Ph.D., Finnish Institute of Occupational Health & Turku University and University Hospital
Why do older workers sleep poorly?

- Sleep deteriorates with age
  - but it gets better when they retire
  - could constitute a vulnerability
- Worries about the next working day
- Worries about not being able to sleep
  - much less of a problem for retirees, presumably
- Stronger experience of fatigue after a poor night’s sleep
- Too wound up to fall asleep
- Poor sleep because of underlying illness
  - depression
  - pain
  - ???

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Effect of retirement on major chronic conditions and fatigue: The French GAZEL occupational cohort study

*BMJ*, 2010;341:c6149.
Measures

• Chronic diseases
  – angina, myocardial infarction, and stroke
  – chronic bronchitis and asthma
  – diabetes

• Mental and physical fatigue
  – 8-point Likert scales, dichotomised upper 20% vs. the rest
  – around 169,000 person-measurement observations

• Depressive symptoms according to CES-D
  – well-established 20-item scale
  – validated French cut-point
Panel A

- Respiratory disease
- Diabetes
- Cardiovascular disease and stroke

Panel B

- Mental fatigue
- Depression CES-D
- Physical fatigue


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Mental fatigue

Physical fatigue


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The role of work and chronic disease in fatigue

<table>
<thead>
<tr>
<th>Health condition</th>
<th>Synergy index (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental fatigue</td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>1.21 (1.05 to 1.40)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.17 (0.92 to 1.47)</td>
</tr>
<tr>
<td>Coronary heart disease or stroke</td>
<td>1.85 (1.44 to 2.38)</td>
</tr>
<tr>
<td>Any chronic disease1</td>
<td>1.30 (1.16 to 1.47)</td>
</tr>
</tbody>
</table>

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Synergy between work and Coronary Heart Disease in the association with Physical Fatigue

Relative risk with contributions from different exposure categories marked. U is the common reference category.
Can the results be generalised?
Whitehall II data

**FIGURE 1.** Prevalence of antidepressant and diabetes medication use adjusted for calendar year and retirement age, in relation to year of retirement at statutory age (error bars indicate 95% confidence intervals). Note that the figure is corrected for the increasing secular trend in prescriptions during the study period.
FIGURE 2. Prevalence of antidepressant use in relation to year of early retirement due to mental causes and physical causes separately and prevalence of use of drugs for diabetes in both these cohorts combined, adjusted for retirement age and calendar year. Error bars indicate 95% confidence intervals. Note that the figure is corrected for the increasing secular trend in prescriptions during the study period. (Note that the scale for y-axis is different than that in Fig. 1.)
Estimated prevalence of heavy drinkers for birth cohort 1939-1943

### Prevalence of heavy drinking - women

<table>
<thead>
<tr>
<th>SES</th>
<th>5 years before % (95%CI)</th>
<th>1 year before % (95%CI)</th>
<th>1 year after % (95%CI)</th>
<th>5 years after % (95%CI)</th>
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</thead>
<tbody>
<tr>
<td>Managers</td>
<td>17.3 (10.2 to 24.4)</td>
<td>16.7 (9.6 to 23.7)</td>
<td>24.4 (16.6 to 32.2)</td>
<td>24.4 (16.0 to 32.8)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>12.0 (10.4 to 13.7)</td>
<td>11.6 (9.9 to 13.2)</td>
<td>15.8 (14.0 to 17.7)</td>
<td>13.5 (11.6 to 15.3)</td>
</tr>
<tr>
<td>Clerical workers</td>
<td>10.4 (8.5 to 12.4)</td>
<td>10.5 (8.5 to 12.5)</td>
<td>13.8 (11.6 to 15.9)</td>
<td>12.6 (10.4 to 14.8)</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Difference (p values)</td>
<td>0.09</td>
<td>0.2</td>
<td>0.03</td>
<td>0.05</td>
</tr>
</tbody>
</table>

### Prevalence of heavy drinking - men

<table>
<thead>
<tr>
<th>SES</th>
<th>5 years before % (95%CI)</th>
<th>1 year before % (95%CI)</th>
<th>1 year after % (95%CI)</th>
<th>5 years after % (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>14.8 (13.1 to 16.5)</td>
<td>15.2 (13.6 to 16.9)</td>
<td>18.4 (16.6 to 20.2)</td>
<td>16.4 (14.6-18.2)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>15.1 (14.1 to 16.0)</td>
<td>14.3 (13.4 to 15.1)</td>
<td>17.5 (16.6 to 18.4)</td>
<td>15.3 (14.3-16.2)</td>
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<tr>
<td>Clerical workers</td>
<td>17.6 (14.4 to 20.8)</td>
<td>14.9 (12.0 to 17.8)</td>
<td>19.5 (16.3 to 22.7)</td>
<td>16.7 (13.5 to 19.9)</td>
</tr>
<tr>
<td>Manual workers</td>
<td>16.7 (15.0 to 18.4)</td>
<td>15.7 (14.2 to 17.3)</td>
<td>17.1 (15.4 to 18.7)</td>
<td>16.5 (14.9 to 18.2)</td>
</tr>
<tr>
<td>Difference</td>
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</tr>
<tr>
<td>Difference (p values)</td>
<td>0.15</td>
<td>0.4</td>
<td>0.6</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Experiences of retiring in Sweden 2008-2010:
My health has improved since I stopped working

Hyde M, & Westerlund H. Preliminary analyses of SLOSH data.
Experiences of retiring in Sweden 2008-2010:
I feel more relaxed since I stopped working

Hyde M, & Westerlund H. Preliminary analyses of SLOSH data.
Experiences of retiring in Sweden 2008-2010: I was stressed by not working
Experiences of retiring in Sweden 2008-2010: I feel that I have lost my role in life

Hyde M, & Westerlund H. Preliminary analyses of SLOSH data.
Self-rated health in relation to retirement in the US

Overall development of SRH in US HRS

Hyde M, Vahtera & Westerlund H. Preliminary analyses of American HRS data.
## Impact of chronic disease before and after retirement

<table>
<thead>
<tr>
<th>Disease</th>
<th>Deterioration</th>
<th>No change</th>
<th>Improvement</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>33</td>
<td>168</td>
<td>59</td>
<td>0.003</td>
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<tr>
<td>Diabetes</td>
<td>15</td>
<td>28</td>
<td>10</td>
<td>0.602</td>
</tr>
<tr>
<td>Asthma</td>
<td>7</td>
<td>20</td>
<td>20</td>
<td>0.006</td>
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<tr>
<td>Rheumatic disease</td>
<td>6</td>
<td>11</td>
<td>26</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Psychiatric disorder</td>
<td>1</td>
<td>9</td>
<td>8</td>
<td>0.021</td>
</tr>
</tbody>
</table>
Implications

• Widespread fatigue before retirement may
  – explain early labour market exit and decreased productivity in older workers
  – create strong opposition to raising of retirement age
  – decreased QUALY
  – the ultimate goal of society is to make good lives possible

• Most workers are healthy beyond 65 years of age

• There is a need for job redesign and flexibility
  – reduce demands which exceed the individual’s capacity
  – utilise the particular strengths of older workers

• Future research needed to investigate
  – generalisability to other countries & settings
  – the specific causes of fatigue
  – the long-term effects of extending working lives

• Better data needed in more countries!

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Ongoing and new research

• SLOSH
  – Swedish Longitudinal Occupational Survey of Health

• Retirement - determinants, experiences, and health consequences
  – FAS project, finances Dr. Martin Hyde

• Determinants of healthy ageing in work and retirement: A cross-national longitudinal study based on the IDEAR network
  – Era Age 2 JCRA, FAS in Sweden
  – Integrated Datasets across Europe for Ageing Research network: Sweden (SU+KI), Denmark, Finland, France & UK

• Healthy and Productive Work in Later Life: Longitudinal studies of the determinants of a sustainable working life for the ageing population
  – FAS programme grant

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THANKS FOR YOUR ATTENTION!

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