Centre for Population Change Seminar
University of Southampton

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Population ageing: the time-bomb that isn't?*

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Population ageing has become a core policy concern because of the implications of current and projected population age structures for future economic performance and the viability of the welfare state.
The 65+ nowadays is the main force behind improving survival.

Change in life expectancy (in years) in England and Wales between each decade

### Background

**Remaining life expectancy at age 65. Eng&Wal. 1841-2041.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Years lived</th>
<th>Remaining life expectancy</th>
<th>Statutory retirement age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>1841-45</td>
<td>65</td>
<td>11.0</td>
<td>11.7</td>
</tr>
<tr>
<td>1881-85</td>
<td>65</td>
<td>10.6</td>
<td>11.6</td>
</tr>
<tr>
<td>1921-25</td>
<td>65</td>
<td>11.3</td>
<td>12.9</td>
</tr>
<tr>
<td>1961-65</td>
<td>65</td>
<td>12.0</td>
<td>15.5</td>
</tr>
<tr>
<td>2001-05</td>
<td>65</td>
<td>16.4</td>
<td>19.4</td>
</tr>
<tr>
<td>2011-15</td>
<td>65</td>
<td>18.9</td>
<td>21.4</td>
</tr>
<tr>
<td>2041-45</td>
<td>65</td>
<td>22.1</td>
<td>24.5</td>
</tr>
</tbody>
</table>

Q Have, since the early 20th century, 65 year olds aged at the same rate, even if their remaining life expectancies are so different?
At the same time, fertility has remained below replacement level for four decades.
Background

Population pyramid of the UK, 1972

In 1972 there were more young people (0-15) than elderly (65+).

Baby booms
- Second half of 1940s
- Mid 1960s
In 2012 the number of young people (0-15) almost equalled that of elderly (65+).

Baby booms
- Second half of 1940s
- Mid 1960s
- Late 80s-early 90s
Background

Population pyramid of the UK, 2012

**Economic dividend:** when baby boomers are of working age

**Difference with 1972 structure:**

Fewer children
Methodology

Population pyramid of Spain, 2001
Methodology

Standard measure of population ageing

Old-Age Dependency Ratio

\[
\text{Population} \quad \frac{65 +}{15 - 64} \quad \text{or} \quad \frac{60 +}{20 - 59}
\]

But is this appropriate (or even accurate)?
We know that the proportion of 65+ in the total population has risen as well as the Old Age Dependency Ratio. However, if we consider improving life expectancy at older ages, the proportion of elderly is actually declining.

**England & Wales 1900-2011**

- % of population aged ≥65
- % of population in age groups with remaining life expectancy ≤15 years
- Old age dependency ratio (%)

*Spijker & MacInnes BMJ 2013;347:f6598*
Sanderson & Scherbov (2007) proposed that remaining live years should be considered instead of chronological age in the construction of ageing indicators, e.g.

<table>
<thead>
<tr>
<th>OADR</th>
<th>Prospective Old-Age Dependency Ratio (POADR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population aged 65+</td>
<td># of people in age groups with RLE ≤15 years</td>
</tr>
<tr>
<td>Population aged 16-64</td>
<td># of people aged 20+ and RLE &gt; 15 years</td>
</tr>
</tbody>
</table>

Yet < 3/4 of those in working age are in paid employment

→ in Spijker and MacInnes (2013) we therefore proposed the Real Elderly Dependency Ratio (REDR)

\[
\text{REDR} = \frac{\text{# men and women in age groups with RLE} \leq 15 \text{ years}}{\text{# men and women employed}}
\]


Results

OADRs, prop. of the population at ages with RLE of ≤ 15 years and the Real Elderly Dependency Ratio. **England and Wales 1950-2050.**

Some popular concerns (myths) about population ageing

- For every productive worker in employment there will be a rising number of older dependent citizens.
- As this ratio elderly:worker increases so will the cost of social insurance and welfare systems to working taxpayers increase.
- The growing elderly population will increase the health and social care systems costs.
- These trends appear irreversible since mortality may be expected to continue to fall.
Myth 1. For every productive worker in employment there will be a rising number of older dependent citizens

The size of the employed workforce is driven by many factors other than age:

- **Gender**: The employment rate of women has increased dramatically as systematic gender discrimination was dismantled in the workplace and the ‘male breadwinner’ employment system weakened.

- **Fertility**: The ratio of productive workers to dependent citizens first moved upwards by the reduction in the number of young people in the population born after the baby boom.

- **Education**: On the other hand, this ratio was also driven down by the shortening of workers’ labour market careers due to needs for a higher educated labour force.

- **Early retirement**: On top of that, less than one half wait until the state retirement age to leave the labour market.
Myth 1. For every productive worker in employment there will be a rising number of older dependent citizens

Economic Activity rates by gender and age group, Scotland 1981\(^\wedge\) and 2010\(^*\)

* The average of four calendar years has been taken for the APS measurements to account for ages that are more influenced by sample fluctuation.
The traditional OADR provides little sense of the impact of population ageing on the real balance of dependency because focus is exclusively on only the first of two contradictory effects of population ageing – the production of more older people.

- If labour force participation (e.g. among women and 55-69 year olds) can be increased it is likely to offset any possible increase in costs associated with population ageing.
Myth 3. The growing elderly population will increase the health and social care systems costs

While the cost of health and social care systems is rising, the increasing **cost of health and social care systems** is in part yet another **aspect of continued economic and technological progress** which creates new possibilities for medical intervention or social protection, although medical and social care also rely heavily on **personal care work** which cannot easily be automated.

As old-age survival is increasing and senescence is slowing down, not age but **time to death** appears to be a better **determinant of expenditure on health** and social care.
Myth 4. All these trends appear irreversible since mortality may be expected to continue to fall

Insofar as the reduction of mortality also entails what might be called the ‘juvenation’ of the population at any given age, it is not clear that longer lives necessarily are or will be ‘older’ ones.

For instance, we found that in terms of expected years left to live, the Scottish population in 2009 was as ‘young’ as it was in 1950.

→ Should we assume a 65 year old in 1950 to be “as old” as a 65 year old in 2009 if their remaining life years are so different?
## Myth 4. All these trends appear irreversible since mortality may be expected to continue to fall

Median age (MA), life expectancy (LE) at MA and Prospective MA. Scotland. 1950-2009

<table>
<thead>
<tr>
<th>Year</th>
<th>Median Age</th>
<th>LE at MA</th>
<th>PMA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>32.6</td>
<td>38.6</td>
<td>32.6</td>
</tr>
<tr>
<td>1975</td>
<td>32.6</td>
<td>41.0</td>
<td>29.9</td>
</tr>
<tr>
<td>2000</td>
<td>38.1</td>
<td>39.7</td>
<td>31.4</td>
</tr>
<tr>
<td>2009</td>
<td>41.1</td>
<td>39.1</td>
<td>32.0</td>
</tr>
</tbody>
</table>

*PMA is the age of a person in year x who has the same remaining life expectancy as a person at the median age in the year under consideration (i.e. the standard year), which in this example is 1950.

Concerns about the sustainability of our welfare system have until now been based on misleading ageing indicators, e.g.

- **Median Age:** Increasing life expectancy has actually caused the UK population to become relatively younger, not older since 1950.

- **OADR:** Gives little sense of the impact of population ageing on the real balance of dependency:
  - **The numerator:** The OADR only focuses on the rise in average years lived, not their additional years left to live, making these elderly ‘younger’ than their peers in earlier cohorts.
  - **The denominator:** The OADR sees the working age population as the non-dependent even though many are. At the same time, increases in productivity and female labour force participation will likely reduce the expected social costs of population ageing.
Moreover, the OADR considers all retired to be ‘dependent’, regardless of their economic, social or medical circumstances

- Many have accumulated assets over their life course that make them quite independent of state support.
- The rise of the ‘grey pound’.
- The role in support of (grand)children (which apparently has no economic value).
- Time to death is more important in the calculation of health care costs than actual age.

A better analysis of the relationship between health and ageing is thus central to the discussion of the implications of population ageing.
International differences in population ageing.

Discussion
Discussion

- Population leaves (Animation shown by John)
Population ageing: the time-bomb that isn't?*

Thank you for your attention

for any queries, please e-mail us at

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j.spijker@ed.ac.uk

Our recent peer-reviewed publications on population ageing:


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