Longevity and Public Finance

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Based on work by Dana Goldman and many other people on the US and Japan Future Elderly Model Projects

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Population Aging Around the World

• Like Japan, China, and Europe, the American population is aging

• The reasons for population aging include
  – Decreased fertility
  – Increased life expectancy

• The US population is aging more slowly than the rest of the world, but still aging very quickly
European Population Pyramid, 2010-2100
US Population Pyramid, 2010-2050
Improvements in US Mortality

The United States is Falling Behind...

Life Expectancy at Birth, OECD

- Canada
- France
- Germany
- Japan
- United Kingdom
- United States
...Especially at Older Ages

Notes: Data come from the Human Mortality Database period life tables for 1975 and 2005. European countries are Denmark, France, Italy, The Netherlands, Spain and Sweden. Weighted average using population size age 50.
Notes: Comparison of Health and Retirement Study 2004 and Survey of Health Ageing and Retirement in Europe 2004 (Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden). Data from Austria not included because of lack of appropriate population weights and Switzerland because of low response rate and small sample. Sample weights used.
...With Resulting Disease in United States

Notes: Comparison of Health and Retirement Study 2004 and Survey of Health Ageing and Retirement in Europe 2004 (Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden). Data from Austria not included because of lack of appropriate population weights and Switzerland because of low response rate and small sample. Sample weights used.
## 10-Year Trends in Health for 40-59 Year Olds

<table>
<thead>
<tr>
<th>Condition</th>
<th>1997-98</th>
<th>2005-06</th>
<th>Change*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musculoskeletal</td>
<td>47</td>
<td>43</td>
<td>↓</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>30</td>
<td>32</td>
<td>↑</td>
</tr>
<tr>
<td>Obesity</td>
<td>26</td>
<td>33</td>
<td>↑</td>
</tr>
<tr>
<td>Vision</td>
<td>11</td>
<td>10</td>
<td>—</td>
</tr>
<tr>
<td>Lung</td>
<td>10</td>
<td>11</td>
<td>↑</td>
</tr>
<tr>
<td>Diabetes</td>
<td>5.6</td>
<td>7.5</td>
<td>↑</td>
</tr>
<tr>
<td>Cancer</td>
<td>5.4</td>
<td>5.8</td>
<td>—</td>
</tr>
</tbody>
</table>

*Significance based on p-values for test of trend for 10-year period in logistic models run separately by condition and controlling for 5-year age intervals.

The Future Elderly Model

• The model tracks the complex interaction between health conditions, disability and mortality
  – Estimated on Health and Retirement Study Data (longitudinal)
  – It tracks economic outcomes such as work, program participation, wealth and detailed medical expenditures (Medicare, Medicaid and Private)

• It uses actual and simulated cohorts of future age 50 individuals
Microsimulation Tracks **Individuals** Over Time

- **210,000 Older Americans (age 51+) in 2015**
  - Survivors
  - Deceased
  - **2015 costs**

- **New 51 year-olds in 2016**
  - Survivors
  - Deceased
  - **2016 costs**

- **Health & functional status, 2016**

- **New 51 year-olds in 2017**
  - Survivors
  - Deceased
  - **2017 costs**

- **Health & functional status 2017**

- **Etc.**
Elements of the Model

- Health-Related Outcomes
- Conditions
  - Heart disease
  - Diabetes
  - Lung disease
  - Cancer
  - Hypertension
  - Stroke
- Functional status
  - ADLs and IADLs
  - Nursing home
  - Death
- Risk Factors
  - BMI
  - Smoking (now/ever)

- Economic Outcomes
- Labor Market
  - Employment
  - Earnings
- Social Security-Related
  - Benefit receipt & amount
  - SS tax revenues
  - Widowhood
- Spending
  - Total medical spending
  - Out-of-pocket spending
- Other Demographic Factors
  - Non-time varying
  - Age, gender, race, education, marital status
Forecast of Real Health Care Spending by Elderly

Matches pre-ACA CBO long run forecast
Simulate What Would Happen if Americans Were as Healthy as Europeans

• Cohort Scenario:
  – Give 2004 cohort of age 50 Americans the health profile of the same cohort of Europeans
  – Keep constant other characteristics of the American population
  – US health improves and catches up in 2030
## Net Fiscal Effects for Age 50 Cohort

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Status Quo</th>
<th>European Scenario</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government Revenues</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal Tax</td>
<td>46,289</td>
<td>47,637</td>
<td>1,348</td>
</tr>
<tr>
<td>State Tax</td>
<td>16,035</td>
<td>16,535</td>
<td>500</td>
</tr>
<tr>
<td>Social security payroll taxes</td>
<td>16,566</td>
<td>17,031</td>
<td>465</td>
</tr>
<tr>
<td>Medicare payroll taxes</td>
<td>4,020</td>
<td>4,132</td>
<td>112</td>
</tr>
<tr>
<td>Total</td>
<td>82,910</td>
<td>85,335</td>
<td>2,425</td>
</tr>
<tr>
<td><strong>Government Expenditures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Age and Survivors Insurance (OASI)</td>
<td>138,123</td>
<td>144,716</td>
<td>6,593</td>
</tr>
<tr>
<td>Supplementary Security Income (SSI)</td>
<td>3,454</td>
<td>3,471</td>
<td>17</td>
</tr>
<tr>
<td>Disability Insurance benefits (DI)</td>
<td>6,356</td>
<td>5,673</td>
<td>-683</td>
</tr>
<tr>
<td>Medicare costs</td>
<td>73,391</td>
<td>68,674</td>
<td>-4,717</td>
</tr>
<tr>
<td>Medicaid costs</td>
<td>21,745</td>
<td>18,058</td>
<td>-3,687</td>
</tr>
<tr>
<td>Total</td>
<td>243,069</td>
<td>240,592</td>
<td>-2,477</td>
</tr>
</tbody>
</table>

**Net Fiscal Effect**                                       +4,902

**Source:** Authors' calculations using the microsimulation model. Amounts reported in $2004 USD. Present discounted values computed using a real discount rate of 3%.
Summary

• What is the impact of these health differences on government finances?
  – NPV of savings to government is $700 billion; $1.1 trillion in reduced health spending
  – Savings in per-period health expenditures are balanced by the annuity burden from longer life expectancy

• All of this ignores the (very large) value to people of better health and longer lives!