The Growing Longevity Gap between Rich and Poor and Its Impact on Redistribution through Social Security

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Averages Versus Disparities

As point of departure, the welfare of the aged has improved dramatically over the last half century

- Poverty rates are much lower than those for younger families
  - 65+ 10%
  - Children 21%
  - Adults (19-64) 13%

- The aged stand out in their near-complete coverage by a generous system of national health insurance

- Largely protected from the consequences of the Great Recession of 2008-09.

- A particular contrast with the economic condition of children

- Major concerns are focused on remaining differences among the elderly by socio-economic group.
Changing Patterns of Mortality

- Ann Case and Angus Deaton (2015) highlighted the rising morbidity and mortality of middle-age white Americans.
- Our focus (Bosworth, Burtless, Zhang 2015) is on the growing gap in old-age life expectancy between the rich and the poor.
- Related paper by Raj Chetty and Others (2016)
I. Case and Deaton

- Substantial improvements in mortality for middle-aged blacks and Hispanics, but none for whites.
- Mortality rates have risen for middle-age whites in contrast with international experience,
  - Increase reflects growing prevalence of drug addiction, alcoholism, and suicide.
  - Attributed to worsening of economic security.
  - Not evident for non-whites or other countries.
- Older white Americans show a mortality decline comparable to other high-income countries.
Mortality Rates by Race, Ages 45-54 per 100 thou
International Comparisons of Mortality, per 100 thou, Age 45-54, Case & Deaton

All cause mortality, ages 45-54

- USW
- FRA
- GER
- USH
- UK
- CAN
- AUS
- SWE

Deaths per 100,000

Year

1990
2000
2010
International Comparisons of Mortality, per 100 thou, Age 55-64, Case & Deaton

All cause mortality, ages 55-64

decaths per 100,000

USW

GER

UK

CAN

USH

SWE

AUS

1990

2000

2010

year
II. Mortality differentials by socioeconomic status (SES)

- At a given age, death rates are higher for folks with low SES—no surprise
  - SES measured by income, earnings, or education

- Mounting evidence of a **growing** gap in life expectancy between rich and poor:
  - Reversal of earlier trend.
Objectives of Analysis

- Explore robustness of finding of increasing differential mortality
- Incorporate alternative measures of socioeconomic status
  - Career Earnings (Income) or
  - Educational Attainment.
- Implications for Recalibrations of OASDI
Survey of Income and Program Participation

- Individuals who participated in, 1984, 1993, 1996, 2001, and 2004 and could be matched to SSA administrative records
  - Respondent or spouse had positive earnings between ages 41-50 (similar to Waldron)
  - 41 thousand men and 46 thousand women with birth years between 1910 and 1950 and 28 thousand deaths through 2012.
  - Mortality analysis limited to annual outcomes at ages 50 and over. (≈ one million person-year obs)
SES Measure - Educational Attainment

- Highly predetermined
- However, years of schooling has limited variability with an upward trend (Bound and others, 2014).
- Convert measure of educational attainment to relative years of schooling compared to 5-year centered average of surrounding birth cohorts.
Mid-Career Earnings

- Average of non-zero SSA earnings ages 41-50 deflated by SSA wage index (adapted from Waldron, 2007)
  - Reduces role of transitory earnings and is closer to concept of permanent income
  - Taxable earnings (1951-77) adjusted for quarter in which they reach the ceiling.
  - Actual W-2 earnings since 1978
  - Cyclical element eliminated by normalizing with 5-year centered average of surrounding birth cohorts.

- Household earnings (sum of respondent & spouse divided by $\sqrt{2}$.)
Figure 1. Male and Female Average Mid-Career Earnings by Birth Year, 1910-1950

Source: Authors' calculations with matched SIPP - Social Security earnings records.
Statistical Model

- Logit regression of mortality risk:
  - \( \left( \frac{h_{it}}{1-h_{it}} \right) = \exp(\beta_{ij} \times X_{ijt}) \), where
  - \( h_{it} = \Pr( Y_{it} = 1 / Y_{it-1} = 0) \) is the hazard that person \( i \) will die in year \( t \);
  - Limited to years after age 50.

- Potential determinants include person’s SES (career earnings or educational attainment), age, birth year, marital status, and disability.

- Interaction between SES and birth year is used as the indicator of increasing differential mortality.
Figure 2. Mortality Probabilities of Men at Ages 65 and 75, by Birth Cohort and Position in Income Distribution

Source: Authors' tabulations of the matched SIPP - Social Security records file. Except for the individuals' assumed incomes, calculations are based on average characteristics of men in the middle income quintile.
Figure 3. Mortality Probabilities of Women at Ages 65 and 75, by Birth Cohort and Position in Income Distribution

Female mortality probability at age 65 (Percent)

- Bottom income decile
- Middle income quintile

Female mortality probability at age 75 (Percent)

Source: Authors' tabulations of the matched SIPP - Social Security records file. Except for the individuals' assumed incomes, calculations are based on average characteristics of men in the middle income quintile.
Figure 4a. Predicted Change in Life Expectancy between 1920 and 1940 Male Birth Cohorts by Position in Normalized Household Earnings Distribution

Source: Authors' tabulations of the matched SIPP - Social Security records file. Results based on Career Earnings X Birth Year interaction.
Figure 4b. Predicted Change in Life Expectancy between 1920 and 1940 Female Birth Cohorts by Position in Normalized Household Earnings Distribution

Predicted life expectancy by fifths of income distribution

<table>
<thead>
<tr>
<th>Equivalent household earnings</th>
<th>Born in 1940</th>
<th>Born in 1920</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>83.6</td>
<td>80.4</td>
<td>+5.6</td>
</tr>
<tr>
<td>4th</td>
<td>86.3</td>
<td>82.5</td>
<td>+3.7</td>
</tr>
<tr>
<td>Middle</td>
<td>84.5</td>
<td>81.9</td>
<td>+2.6</td>
</tr>
<tr>
<td>2nd</td>
<td>82.5</td>
<td>81.1</td>
<td>+1.5</td>
</tr>
<tr>
<td>Bottom</td>
<td>80.7</td>
<td>80.4</td>
<td>+0.3</td>
</tr>
</tbody>
</table>

Source: Authors' tabulations of the matched SIPP - Social Security records file. Results based on Career Earnings X Birth Year interaction.
Figure 4c. Predicted Change in Life Expectancy between 1920 and 1940 Birth Cohorts by Position in Normalized Household Earnings Distribution

Source: Authors' tabulations of the matched SIPP - Social Security records file. Results based on Career Earnings X Birth Year interaction.
Basic Conclusions on Mortality

- Strong statistical evidence that SES affects life expectancy
  - Persons with high career earnings or high education live longer than those with low career earnings or less schooling
  - Marital status and prior disability also strong predictors of mortality
  - Race is more marginal controlling for other determinants

- Significant pattern of increasing differential mortality over time.

- Inclusion of measures of health status, behavioral indicators (smoking, drinking, etc) are also strong predictors of mortality, but do not reduce role of SES, nor erase the trend toward a larger mortality gap.
Distribution of Annual and Lifetime Benefits

- Annual benefits are much more equally distributed than mid-career earnings
  - Benefits in the bottom decile are three times larger than if they were strictly proportionate to career earnings, and benefits are relatively unchanged at higher incomes.
  - Reflects progressive benefit formula.

- A portion of the progressivity of benefits is offset on a lifetime basis because
  - Higher income beneficiaries live longer, and
  - The differential is growing rapidly for later birth cohorts.
  - Estimated increase of 40 percent for top earnings decile between 1920 and 1940 birth cohorts
Distribution of OASDI Benefits and Career Earnings, Ratio to Mean

SIPP Sample Men
Average of 1910-57

Career Earnings
Lifetime Benefits

Annual Benefits

Equivalized Household Earnings Decile
Figure 5. Lifetime Equivalized Social Security Benefits Calculated with Mortality Rates of 1920 and 1940 Birth Cohorts

**Men**
Ratio of lifetime equivalized benefits to 1920 mean lifetime benefits

- Birth year 1940
- Birth year 1920

**Women**
Ratio of lifetime equivalized benefits to 1920 mean lifetime benefits

- Birth year 1940
- Birth year 1920

Source: Authors' calculations using the matched SIPP - Social Security records file. Equivalized benefits use the combined total for couples divided by the square root of 2.
Conclusion

- The gap in life expectancy between individuals at the top and bottom of the distribution of earnings and educational attainment is large, and growing rapidly.
  - Differences in mortality offset some of the progressivity built into the OASDI system, but it remains highly equalizing on a lifetime basis.
  - Raises questions about the equity of increasing the retirement age for those at the bottom of the income distribution.
- We do not have a verifiable explanation for the increasing disparities in life expectancies.