Declining Mortality (Increasing Longevity): At What Rate?

Steve Goss Office of the Chief Actuary Social Security Administration

AAA meeting
November 15, 2017
Perspective: “Aging” Not Mainly from Mortality

Aging (change in age distribution) mainly due to drop in birth rates
Mortality Decline \textit{Varies} Over Time

Conditions: Antibiotics/economy 1936-54; Medicare/Medicaid 1968-82
Appropriate Data: by Age Critical

Age-gradient in past reduction is clear

**Long-Term Historical Average Annual Rates of Reduction in Mortality 1929 to 2009**

**Recent Historical Average Annual Rates of Reduction in Mortality 1982 to 2009**
Mortality Decline by *Cause of Death*:
*Rate of change from 1979 to 2013*

**FEMALE**

**MALE**

[Bar charts showing mortality decline by cause of death for both genders from 1979 to 2013, with categories for each age group (Under 15, 15-49, 50-64, 65-84, 85+). The graphs display the rate of change for Cardiovascular, Cancer, Violence, Respiratory, and Other causes.]

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Mortality Experience: Ages 65 and Older
Reductions since 2009 continue to fall short of expectations
Mortality Experience: Ages Under 65

*Actual increase since 2010*
Developing Assumptions by Cause

- Scientific approach reflecting biology
- Trustees and SSA/OCACT develop in consultation with other experts
- Johns Hopkins recent survey of medical researchers and clinicians came to very similar medium term expectations—individually
  - Trustees’ medium-term rates by cause had not been published
Cardiovascular: JHU Less Optimistic than Trustees over Age 50 for Next 30 Years

Cardiovascular Disease-Female
Average Annual Percent Reduction
JHU values are for the period 2009-2040

Cardiovascular Disease-Male
Average Annual Percent Reduction
JHU values are for the period 2009-2040
Respiratory: JHU More Optimistic under Age 50, Less Optimistic over Age 85

**Respiratory-Female**

Average Annual Percent Reduction  
JHU values are for the period 2009-2040

<table>
<thead>
<tr>
<th>Age Group</th>
<th>1979 to 2010</th>
<th>2010 to 2038</th>
<th>2038 to 2088</th>
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<tbody>
<tr>
<td>Under Age 15</td>
<td>JHU 1.7</td>
<td>JHU 0.8</td>
<td>JHU 0.1</td>
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<td>Ages 15 - 49</td>
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<td>Ages 50 - 64</td>
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<td>Ages 65 - 84</td>
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<td>Ages 85 and older</td>
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<td>Total</td>
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**Respiratory-Male**

Average Annual Percent Reduction  
JHU values are for the period 2009-2040

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Cancer: JHU Very Similar to Trustees’ Expectations

**Cancer-Female**

Average Annual Percent Reduction

JHU values are for the period 2009-2040

- Under Age 15
- Ages 15 - 49
- Ages 50 - 64
- Ages 65 - 84
- Ages 85 and older
- Total

**Cancer-Male**

Average Annual Percent Reduction

JHU values are for the period 2009-2040

- Under Age 15
- Ages 15 - 49
- Ages 50 - 64
- Ages 65 - 84
- Ages 85 and older
- Total
How Future Conditions Might Change

- Smoking decline for women
  - Started and stopped later than men
- Obesity—sedentary lifestyle
- Difference by income/earnings
- Health spending—must decelerate
  - Advances help only if apply to all
- Human limits
  - Increasing understanding of deceleration

Sam Preston 2010—must consider cumulative effects

Increasing duration of obesity for aged in future
Death Rates Vary by Career Earnings Ranking

*Difference has increased*

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**Female 65-69 Retired-Worker**

Relative Death Rates by AIME Quartile

- **1990**
- **2010**
Mortality Decline by Education
Must be careful on changing shares (Bound 2014)

Female Non-Hispanic-White Population
Annualized Death Rates from Age 65 to 85
by Educational Attainment

- All < High School
- Low 25% Education
- High 75% Education

1990
2010
Health Spending Cannot Continue to Rise at Historical Rates

Note Trustees’ deceleration

Annual Percent Change in Medicare Cost per Beneficiary Relative to GDP per Worker: 2015 TR

-1% 0% 1% 2% 3% 4% 5%

Is There an Omega?

*It appears we are rectangularizing the survival curve?*

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**Survival Curve U.S. Female: Period Data**

![Graph showing survival curves for female in U.S. for different years (1900-2013).](image)

**Survival Curve U.S. Male: Period Data**

![Graph showing survival curves for male in U.S. for different years (1900-2013).](image)