Emerging Trends in Mortality
The views expressed in this session are those of the presenters and do not necessarily reflect the views or position of the Academy or its boards, councils, or committees, nor do they express the opinions of the presenters’ employers.
Panel

Arialid M. Miniño, MPH, Centers for Disease Control and Prevention, National Center for Health

Stephen C. Goss, MAAA, ASA, Social Security Administration

Mary J. Bahna-Nolan, EVP, Head of Life R&D, SCOR Global Life
Agenda

• Setting the stage – Mortality trends in the US
• Causes of death and how they differ amongst the population
• Why is the insured population different or is it?
• Q&A
Mortality Trends in the United States

Arial M. Miniño
National Center for Health Statistics
Life Expectancy at Birth and Age-Adjusted Death Rates: United States, 1900-2015

Deaths per 100,000 standard population

Age-adjusted death rates

Life expectancy at birth

Age in years

NOTE: Prior to 1933, data are for death-registration States only.
Joinpoint regression analysis age-adjusted death rates, United States 1975-2015

- Observed
- 1975-2003 APC = -0.87
- 2003-2009 APC = -1.95
- 2009-2015 APC = -0.57

The Annual Percent Change (APC) is significantly different from zero at alpha = 0.05.

Rate per 100,000 standard population

Female
Joinpoint regression analysis age-adjusted death rates, Males United States 1975-2015

*The Annual Percent Change (APC) is significantly different from zero at alpha = 0.05*
Age-adjusted death rates for metropolitan and non-metropolitan areas by age group: United States, 2000-2015

Rate

Non-metro

Metro

Ages 65 and older

Ages 45-64

Non-metro

Metro
Age-adjusted death rates for metropolitan and non-metropolitan areas by age group: United States, 2000-2015

Rate

Ages 65 and over

Ages 45-64


Non-metro Metro
Age-adjusted death rates for heart disease, cancer, stroke and unintentional injuries: United States, 1900-2015

NOTE: Data prior to 1933 contain death-registration States only.
Age-adjusted death rates for Poisoning (unintentional) and Falls (unintentional)
United States, 1999-2015

Rate per 100,000 standard population

Poisoning (unintentional only)

Unintentional falls
The “causes of death from despair,” and then some, after Case & Deaton
Drug poisoning from all intents: All races; non-Hispanic white
United States, 1999-2015

Drug poisoning (all intents, all races)
Drug poisoning (all intents, non-Hispanic white)

Rate per 100,000 standard population
The “causes of death from despair,” and then some, after Case & Deaton
Suicide: All races; non-Hispanic white
United States, 1999-2015

Rate per 100,000 standard population

Suicide (non-Hispanic white)
Suicide (all races)
The “causes of death from despair,” and then some, after Case & Deaton
Chronic liver disease, cirrhosis: All races; non-Hispanic white
United States, 1999-2015

Rate per 100,000 standard population

Liver disease (non-Hispanic white)

Liver disease (all rac
Deaths from selected drug poisoning involving opioids, by drug type
United States, 1999-2015

Number of deaths

- Opioid deaths
- Heroin
- Natural and semisynthetic opioids
- Methadone


Number of deaths: 0, 50000
Estimated Age-adjusted Death Rates for Drug Poisoning by County, United States: 2003
Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2005
Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2011
Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2014
Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2015
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 Varies Over Time

Conditions: Antibiotics/economy 1936-54; Medicare/Medicaid 1968-82

Female Historical and Projected (2014 Trustees Report)
Annual Percent Reduction in U.S. Mortality Rates

Male Historical and Projected (2014 Trustees Report)
Annual Percent Reduction in U.S. Mortality Rates
Appropriate Data: by Age Critical

Age-gradient in past reduction is clear
Mortality Decline by *Cause* of Death:
Rate of change from 1979 to 2013
Mortality Experience: Ages 65 and Older

Reductions since 2009 continue to fall short of expectations

Age-Sex-Adjusted Death Rates
(Ages 65 and Older)

- 2015TR
- 2016TR
- 2017TR
- Actual
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 (JHU) recent survey of medical researchers and clinicians came to very similar medium term expectations—inddependently
  - 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](chart1)

![Cardiovascular Disease-Male](chart2)
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>
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<tbody>
<tr>
<td>Under Age 15</td>
<td>JHU 1.7</td>
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</tr>
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<td>Ages 15 - 49</td>
<td>JHU 0.5</td>
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</tr>
<tr>
<td>Ages 50 - 64</td>
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</tr>
<tr>
<td>Ages 65 - 84</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ages 85 and older</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td></td>
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**Respiratory-Male**

Average Annual Percent Reduction

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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

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<tr>
<td>Under Age 15</td>
<td>1.8</td>
<td>0.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Ages 15 - 49</td>
<td>1.3</td>
<td>1.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Ages 50 - 64</td>
<td>1.1</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Ages 65 - 84</td>
<td>1.0</td>
<td>1.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Ages 85 and older</td>
<td>0.5</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Total</td>
<td>1.3</td>
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Cancer-Male
Average Annual Percent Reduction
JHU values are for the period 2009-2040

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<td>1.3</td>
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<tr>
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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*
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

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>&lt; High School</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Low 25% Education</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>High 75% Education</td>
<td>5%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Health Spending Cannot Continue to Rise at Historical Rates

Note Trustees' deceleration
Is There an Omega?

It appears we are rectangularizing the survival curve?
Why is the insured population different? Or is it?

Mary J. Bahna-Nolan, MAAA, FSA, CERA
EVP, Head of Life R&D
News Flash

• In June of 2016, articles in *The Washington Post* and *The Wall Street Journal* cited new CDC data from 2015 which showed a rise in the US mortality rate.

• Other recent research published by Case and Deaton (Princeton University), Truesdale and Jenks (Harvard University) and The Lancet all point to changes in US life expectancy, reduction in improvement and increase in socio-economic divide.

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Mortality Trends – CDC 2015

<table>
<thead>
<tr>
<th>Decreases in Mortality</th>
<th>Increases in Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td>Unintentional Injuries</td>
</tr>
<tr>
<td>Cancer</td>
<td>Suicide</td>
</tr>
<tr>
<td>Stroke</td>
<td>Alzheimer’s</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>Chronic Liver Disease</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
</tr>
</tbody>
</table>

• The Centers for Disease Control and Prevention (CDC) regularly issues news releases regarding current trends in US population mortality.
While the US population data shows a slowdown in mortality improvement, the same is not seen in the insured population.

- The same drivers of the slowdown in the general population are not seen in the insured portfolio.
- Between 2014 and 2015, deaths due to poisonings increased from 1.6% to 1.7% for all ages but from 12.8% to 14.5% for ages 35-44.
- SCOR does not see poisonings as a major (or even minor) driver of deaths.
Comparing CDC to Insured* – Male/Female Totals Age 20-54

<table>
<thead>
<tr>
<th>Cause of Death Category</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s Disease</td>
<td>0.0%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Blood Diseases</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Circulatory System Diseases</td>
<td>21.3%</td>
<td>17.5%</td>
</tr>
<tr>
<td>Congenital Anomalies</td>
<td>0.5%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Digestive System Diseases</td>
<td>4.2%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Endocrine Diseases</td>
<td>2.7%</td>
<td>2.5%</td>
</tr>
<tr>
<td>External Causes</td>
<td>10.1%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Genitourinary System Diseases</td>
<td>0.9%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Infectious Diseases</td>
<td>3.9%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Influenza and Pneumonia</td>
<td>1.0%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Motor Vehicle Accidents</td>
<td>7.6%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Neoplasms</td>
<td>15.7%</td>
<td>28.3%</td>
</tr>
<tr>
<td>Nervous System Diseases</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>9.7%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Perinatal Period Diseases</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Poisoning</td>
<td>10.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Pregnancy and Childbirth</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Respiratory System Diseases</td>
<td>2.2%</td>
<td>3.8%</td>
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<tr>
<td>Suicide</td>
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<td>1.6%</td>
</tr>
<tr>
<td>Influenza and Pneumonia</td>
<td>0.7%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Motor Vehicle Accidents</td>
<td>6.9%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Neoplasms</td>
<td>26.1%</td>
<td>48.1%</td>
</tr>
<tr>
<td>Nervous System Diseases</td>
<td>1.9%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Other</td>
<td>1.6%</td>
<td>1.7%</td>
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<td>Perinatal Period Diseases</td>
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<td>2.6%</td>
</tr>
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<td>Suicide</td>
<td>12.4%</td>
<td>5.1%</td>
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* Insured based on SCOR internal study

Causes where insured experience is significantly different from general population

Male Risks

1. Circulatory (21%) Neoplasms (26%)
2. Neoplasms (16%) Circulatory (22%)
3. Poisonings (10%) External (20%)
4. External (10%) Suicides (12%)
5. Suicide (10%) Motor Vehicle Accidents (7%)

Female Risks

1. Neoplasms (28%) Neoplasms (48%)
2. Circulatory (18%) Circulatory (16%)
3. Other (12%) External (12%)
4. Poisonings (9%) Suicide (5%)
5. External (5%) Motor Vehicle Accidents (4%)
### Comparing CDC to Insured* – Male/Female Totals Age 55-89

#### Male Risks

<table>
<thead>
<tr>
<th>Cause of Death Category</th>
<th>CDC</th>
<th>Insured</th>
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<tbody>
<tr>
<td><strong>Top Causes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Circulatory (33%)</td>
<td>Neoplasms (39%)</td>
</tr>
<tr>
<td>2</td>
<td>Neoplasms (26%)</td>
<td>Circulatory (26%)</td>
</tr>
<tr>
<td>3</td>
<td>Other (11%)</td>
<td>External (10%)</td>
</tr>
<tr>
<td>4</td>
<td>Respiratory (9%)</td>
<td>Respiratory (5%)</td>
</tr>
<tr>
<td>5</td>
<td>Endocrine (3%)</td>
<td>Suicide (3%)</td>
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#### Female Risks

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<td>Circulatory (33%)</td>
<td>Neoplasms (44%)</td>
</tr>
<tr>
<td>2</td>
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<td>Circulatory (22%)</td>
</tr>
<tr>
<td>3</td>
<td>Other (16%)</td>
<td>External (9%)</td>
</tr>
<tr>
<td>4</td>
<td>Respiratory (9%)</td>
<td>Respiratory (6%)</td>
</tr>
<tr>
<td>5</td>
<td>Alzheimer’s (6%)</td>
<td>Nervous System /Other /Digestive (3%)</td>
</tr>
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* Insured based on SCOR internal study
The trends over time seem to hold for differences in the causes of death between general population and insured population

| CDC | Ages 20-54 | | CDC | Ages 55-89 |
|-----|------------|-----|-----|------------|-----|
| Neoplasms | 21.6% | 21.0% | 20.6% | 20.3% | 19.7% | 18.7% | | Circulatory System Diseases | 34.1% | 33.3% | 33.1% | 32.9% | 32.8% | 32.9% |
| Circulatory System Diseases | 20.5% | 20.1% | 20.0% | 19.9% | 19.7% | 19.3% | | Other | 12.8% | 13.5% | 14.1% | 14.2% | 13.9% | 13.2% |
| Other | 10.3% | 10.3% | 10.5% | 10.7% | 10.7% | 10.8% | | Respiratory System Diseases | 8.4% | 8.6% | 8.5% | 8.7% | 8.5% | 8.7% |
| Poisoning | 8.4% | 9.1% | 9.1% | 9.6% | 10.3% | 11.5% | | Alzheimer’s Disease | 4.0% | 3.9% | 3.8% | 3.8% | 4.1% | 4.7% |
| External Causes | 8.3% | 8.4% | 8.3% | 8.1% | 8.0% | 8.4% | | Endocrine Diseases | 3.0% | 3.2% | 3.1% | 3.1% | 3.1% | 3.2% |
| Suicide | 7.7% | 7.8% | 8.0% | 7.9% | 8.1% | 8.2% | | Infectious Diseases | 2.5% | 2.5% | 2.5% | 2.6% | 2.6% | 2.6% |
| Motor Vehicle Accidents | 6.4% | 6.4% | 6.7% | 6.5% | 6.4% | 6.7% | | Influenza and Pneumonia | 2.2% | 2.3% | 2.2% | 2.4% | 2.2% | 2.3% |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Insured | | | | | | |
| Neoplasms | 34.1% | 37.1% | 34.3% | 33.7% | 32.6% | 32.6% | | Circulatory System Diseases | 25.0% | 24.3% | 24.8% | 25.7% | 24.3% | 24.0% |
| Circulatory System Diseases | 21.0% | 19.8% | 19.1% | 19.7% | 19.2% | 20.5% | | Neoplasms | 42.8% | 42.7% | 41.0% | 40.7% | 39.2% | 39.0% |
| Other | 0.6% | 1.4% | 2.0% | 1.7% | 1.8% | 2.1% | | Other | 0.7% | 1.5% | 3.0% | 2.9% | 3.0% | 2.9% |
| Poisoning | 0.0% | 0.1% | 0.1% | 0.1% | 0.2% | 0.1% | | Respiratory System Diseases | 4.1% | 4.2% | 5.2% | 5.4% | 5.6% | 6.6% |
| External Causes | 19.8% | 17.7% | 16.8% | 15.8% | 17.3% | 16.4% | | Alzheimer’s Disease | 0.1% | 0.3% | 0.8% | 0.9% | 1.1% | 0.8% |
| Suicide | 9.6% | 9.1% | 9.9% | 10.7% | 10.0% | 9.5% | | Endocrine Diseases | 1.2% | 1.4% | 2.3% | 2.4% | 2.3% | 2.3% |
| Motor Vehicle Accidents | 6.9% | 5.9% | 6.0% | 5.6% | 4.8% | 5.8% | | Infectious Diseases | 1.2% | 1.1% | 1.6% | 1.6% | 1.7% | 2.0% |
| | | | | | | |
| | | | | | | |
| | | | | | | |
Why The Difference Between CDC and Insured?

• The make-up of the fully underwritten life insurance policyholder is considerably different than that of the US population (i.e., basis risk) whereas the insured population tends to be of a higher socio-economic group than the general population.

• There are clear differences in mortality by socio-economic class. This can be seen across all age groups in the general population whereby level of attained education is used as a proxy for socio-economic status.

• Although mortality rates increased for the general population for all education levels, mortality continues to be significantly higher for lower educated (i.e., lower socio-economic) groups. This is true across all ages, but even more so at younger age groups.
Why do we care about the general population for insured mortality?
Mortality risk is composed of three components:

- **Trend risk**: Risk that mortality rates do not improve as expected.
- **Level risk**: Risk of an inaccurate assessment of current mortality rates.
- **Volatility risk**: Risk of volatile mortality rates due to insufficient mutualisation, heterogeneous portfolio.

**Total risk** is the combination of all components.

For most companies, the trend risk is a significant contributor to the projected value of a policy or a company’s inforce value. Population data provided a homogenous dataset vs the insured data.

*Pandemic risk considered separately.*
Why do we care about population mortality?

**Common industry practice to use population data as the basis for the trend assumption**

- Insured data is not homogenous from year to year
  - Changes in the underwriting eras, mix of business, and contributing companies cause discontinuities in the data
  - Reinsured data is further challenged in that the client mix changes from year to year
- This creates basis risk, which is difficult to quantify
- The basis risk varies depending on many factors, including:
  - Regional differences
  - Target market & cohort differences
  - Public health policy & access to diagnostic screening and advanced medical care
  - Level of underwriting
Drivers of basis risk

1. Insured population tends to be issued to individuals in a much higher socio-economic class
   - Access to better health care and living conditions;
   - Access to better health care and living conditions;
   - Make better lifestyle choices.

2. Deaths due to influenza and pneumonia tend to impact the general population more heavily than the insured population.

3. Insured population tends to have a lower percentage of tobacco/smoker risks than the general population.

4. The underwriting process is somewhat self-selecting
   - Greater proportion of preferred risks
   - Risks of poor health are declined;
   - Less healthy risks are rated or charged increased premiums/cost of insurance.

Only those that can afford the higher premiums (i.e., upper/middle income) take the insurance.
Changes in the trends by cause of death could and likely do impact the mortality level, especially at the older ages

- The trends and frequency of significant causes of death can be leading indicators for insurance claims;

- Environmental and medical advancement can impact causes of death and change future perspective on mortality, resulting in an impact on future trend and possibly level of mortality
  - Example: Immunotherapies, Alzheimer’s, Aging

- Important to examine how an individual COD trend change would affect overall mortality, including trend change by subgroups.

* Results from SCOR proprietary industry study
Difference Between US and Insured Populations

- JAMA (2016)

Special Communication

The Association Between Income and Life Expectancy in the United States, 2001-2014

Raj Cherry, PhD; Michael Stepner, BA; Sarah Ahram, BA; Shelby Lin, MPH; Benjamin Scuderi, BA;
Nicholas Turner, PhD; Augustin Begemann, MA; David Cutler, PhD

A Life expectancy by income quartile by year

Income quartile (mean income):
- 4th ($256,000)
- 3rd ($183,000)
- 2nd ($47,000)
- 1st ($17,000)

Men

Income quartile (mean income)
- 4th ($243,000)
- 3rd ($177,000)
- 2nd ($43,000)
- 1st ($16,000)

Women

Annual change
- 4th ($256,000)
- 3rd ($183,000)
- 2nd ($47,000)
- 1st ($17,000)

Annual change
- 4th ($243,000)
- 3rd ($177,000)
- 2nd ($43,000)
- 1st ($16,000)
Key Findings of Chetty, Stepner, et al Study

• Life expectancy increased continuously with income.

• Between the top 1% and bottom 1% of the income distribution, life expectancy differed by 15 years for men and 10 years for women.

• There was a larger increase in life expectancy for higher income groups during the 2000’s. Between 2001 and 2014, individuals in the top 5% of the income distribution gained around 3 years of life expectancy, whereas individuals in the bottom 5% experienced no gains.

• Most of the variation in life expectancy across various geographic areas [and income levels] was related to differences in health behaviors, including smoking, obesity, and exercise.

• Individuals in the lowest income quartile have more healthful behaviors and live longer in areas with more immigrants, higher home prices and more college graduates.

JAMA, April 10, 2016: Raj Chetty, PhD; Michael Stepner, BA; Sarah Abraham, BA; Shelby Lin, MPhil; Benjamin Scuderi, BA; Nicholas Turner, PhD; Augustin Bergeron, MA: David Cutler, PhD
Analysis of other data sources such as credit attributes highlights the cohort differential within the population – these must be considered when evaluating mortality impacts and trends between populations

- Traditional A/E methods are often used to understand mortality experience. These methods work well to control for age / gender / duration / tobacco status / UW class in one number

- Disadvantages of traditional A/E
  - Interpreting results requires some knowledge of the underlying table/cohort
  - Basis risk differences between cohorts can be significant – may misinterpret traditional A/E if basis risk not quantified

Source: SCOR proprietary study
Insurance applicants have more favorable mortality, even before any UW selection

The correlation between mortality and income levels is preserved

Source: Population (LexisNexis Portfolio) vs Insurance Applicants Portfolio from proprietary LexisNexis & SCOR study
The underwriting process further drives a difference between US and insured populations

- Preferred risk programs increase not-taken rates in the residual classes, resulting in a skewing of placed risks into the best classes.
Important to understand a company’s target market

- Two companies with similar underwriting can have a very different customer profile based on target market and distribution, leading to mortality rates with a very different relationship to population mortality between the two.

Source: SCOR proprietary study
Conclusions

• There has been much press and scrutiny regarding a decline in expected longevity for the US population relative to other developed nations.

• While these studies have received noted publicity in the press, it is important to recognize that trends in the general population do not necessarily translate to trends in the insured population.

• The insured population tends to be in a higher socio-economic class with access to better health care and living conditions and generally make healthier lifestyle choices.
  – For example, the insured population has a lower percentage of tobacco/smoker risks than the general population (less than 5% in the SCOR proprietary industry study) with a significantly increased cost of insurance for tobacco users.
Conclusions, cont’d

• The insurance industry’s extensive underwriting process (detailed health questions plus medical exam and/or fluid collection) tends to select risks that are generally in much better health than the average individual in the US population.
  – Poorer risks are declined insurance or are rated as substandard and pay appropriately higher premiums.
  – This tends to result in a greater proportion of preferred risks and, for impaired lives, a higher proportion in the upper and middle income status who can afford an increased cost of insurance.

• As more companies broaden their focus to increase penetration in the middle income market, there will likely by a shift in the drivers of insured mortality towards that of the general population.

• It is important to pay attention to population trends. For example, the increased use of e-cigarettes and vaping, especially in the younger population, is worth further study.
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http://www.cdc.gov/nchs/deaths.htm