Key Mortality Update for Chief Actuaries

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To be covered:

- Latest CMI snippets
- Drivers of recent mortality experience
- Blip or dip?
- CMI16 mortality improvement model
- Mortality trend by socio-economic class
- Healthy lives
CMI snippets

- High age mortality
  - Working Paper 100 – June 2017
  - calibration of mortality projections; close off mortality tables
  - difficult due to lack of data for ages over 100

- SAPS mortality experience for period 2009-2016
  - proposed “S3” series mortality table for consultation in 2018

- Annuitants mortality experience for period 2011-2014
  - Analysis by product type

- CMI16 mortality improvement model released
  - new model: more than a data refresh
Drivers of recent mortality experience

Recent mortality improvements

Cause of death

- Deaths as a result of diseases to the circulatory system forms the majority of the improvement
- Most significant factor was reduced smoking
- Limited potential for future improvements

Other reasons

- NHS spending
- Ageing population
- Treatment rather than prevention
- Social care
- Multi morbidity
- Frailty
Clinical insight

“It’s not how old you are but how you are old.”
Jules Reynard

- Increasing frailty – reduced resilience and increased vulnerability – needs to be recognised as a long term condition
- The more things that go wrong the greater the risk of adverse outcomes
- Need to start to manage the general condition of age rather than each separate problem

Clinical insight

[Diagram showing the transition from independence to dependence in a frail older person compared to a fit older person.]

Source: Dr. C. Chill
Blip or dip?

• General consensus a dip in mortality improvements (rather than blip)
• Similar pattern being seen in other countries
• But for how long? Short term? Medium term?
Factors that may impact length of dip

• Recession/ austerity
• Estimated £30 billion NHS funding gap in 2020/21
• Estimated £2 billion additional funding required in 2017 for social care
• Economics will be a key factor

Other potential factors

• Medical break through
• Dementia
• Technology
• Antibiotic resistance
• Cyber attack on NHS
CMI16 mortality improvement model

- New model released in March 2017
- High level structure same as previous model
  - historic (initial) rates, long term rates and transition
- Introduction of smoothing parameters to allow the user to choose level of smoothing of historic data
CMI16 mortality improvement model

• Able to change the underlying data easily
• Change to the tapering (i.e. when rates reduce to zero)

Source: Hymans Robertson

CMI16 mortality improvement model

• Change to definition of improvements (from qx to mx)
• Risk that assumptions are unintentionally weakened

Source: Hymans Robertson
Mortality trend by socio-economic class

- CMI mortality improvement models use population data
- Are pension scheme members/annuitants a select subset of the population?
- Have these people seen different mortality improvements relative to the population as a whole?
- And does it matter?
Mortality by socio-economic class

Table 2.1: Comparison of mortality improvements between the SAPS dataset and the England & Wales (E&W) general population (males, ages 55-100).

<table>
<thead>
<tr>
<th>Year</th>
<th>E&amp;W</th>
<th>SAPS (Lives)</th>
<th>SAPS (Amounts)</th>
<th>Difference (Lives)</th>
<th>Difference (Amounts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>-0.9% ±0.7%</td>
<td>-0.2% ±1.9%</td>
<td>+1.4% ±3.9%</td>
<td>+0.7% ±2.0%</td>
<td>+2.3% ±4.0%</td>
</tr>
<tr>
<td>2013</td>
<td>+0.5% ±0.7%</td>
<td>+2.0% ±2.1%</td>
<td>+3.5% ±4.2%</td>
<td>+1.5% ±2.2%</td>
<td>+3.0% ±4.2%</td>
</tr>
<tr>
<td>2014</td>
<td>+3.7% ±0.7%</td>
<td>+4.8% ±2.1%</td>
<td>+3.3% ±4.6%</td>
<td>+1.1% ±2.2%</td>
<td>-0.4% ±4.6%</td>
</tr>
<tr>
<td>2015</td>
<td>-3.7% ±0.7%</td>
<td>-2.0% ±4.2%</td>
<td>-6.8% ±7.9%</td>
<td>+1.7% ±4.3%</td>
<td>-3.1% ±8.0%</td>
</tr>
<tr>
<td>Average</td>
<td>-0.1% ±0.4%</td>
<td>+1.2% ±1.4%</td>
<td>+0.4% ±2.7%</td>
<td>+1.2% ±1.4%</td>
<td>+0.5% ±2.7%</td>
</tr>
</tbody>
</table>

Source: CMI Working Paper 37

Mortality by socio-economic class

Annual male mortality improvement by socio-economic group

ONS data (by RGA) vs Club Vita dataset

Source: RGA analysis of ONS data
Source: Club Vita / Hymans Robertson
Mortality by socio-economic class

Different datasets/ different time period of investigation produce different results and different materiality

Smaller subsets of data may affect credibility

More work to be done
Healthy lives

• Is there a super-healthy group?
• Can an average person become super healthy?
• What rate of improvement would there need to be?
• Work undertaken by Just and WTW

Healthy lives – selection criteria

• Consider adults with no relevant history in their GP records (e.g. smoking, height/weight, blood pressure)
• Absence of (and no history of)
  - diabetes, cancer, heart disease, kidney disease etc.
• Presence of
  - good BMI, good socio-economic group, good cholesterol
Healthy lives

• Synthetic group of healthiest lives with no observable illness
• Elimination of chronic diseases and existing medical history by age 65
• Life expectancy of 93 years (cf. 80 years male and 83 years female)
• Long term annual rate of improvement of 1.25% is sufficient to reduce mortality of everyone to current healthiest within 100 years

Healthy lives

• Mortality reduction required to:
  - Increase average longevity to 100 years
    Super healthy 50%
    General population 90%
  - Increase average longevity to 120 years
    Super healthy 87%
    General population 99%
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