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Key Mortality Update for Chief Actuaries

Beverley Alford, Legal & General



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



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CMI snippets

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



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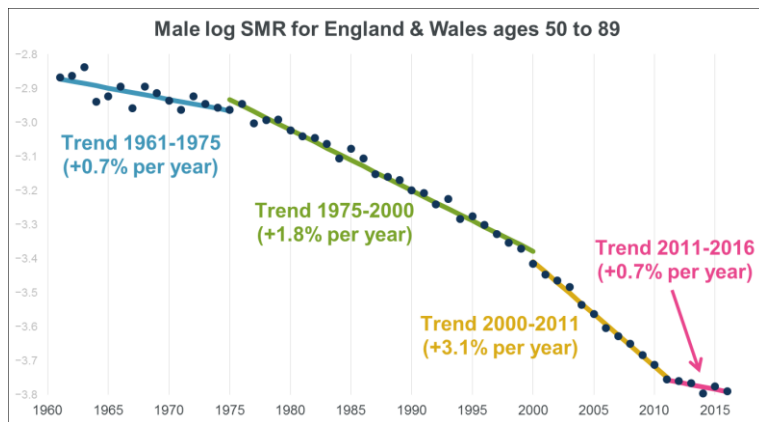


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Drivers of recent mortality experience



Recent mortality improvements

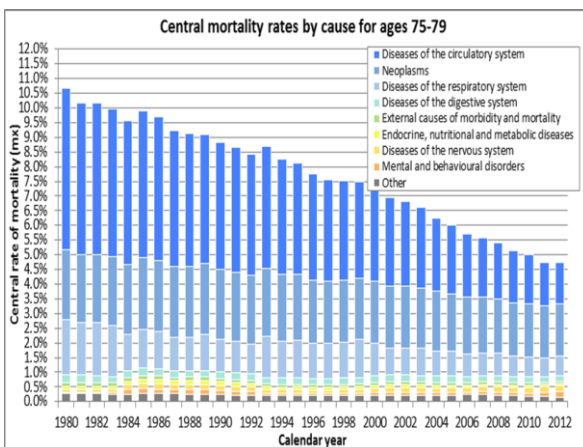


Source: CMI calculations. Standard population is European Standard Population 2013. Trend is $\Delta \log \mu$.



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Cause of death



Source: Legal & General



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- 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



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Clinical insight

"It's not how old you are but how you are old."

Jules Reynard

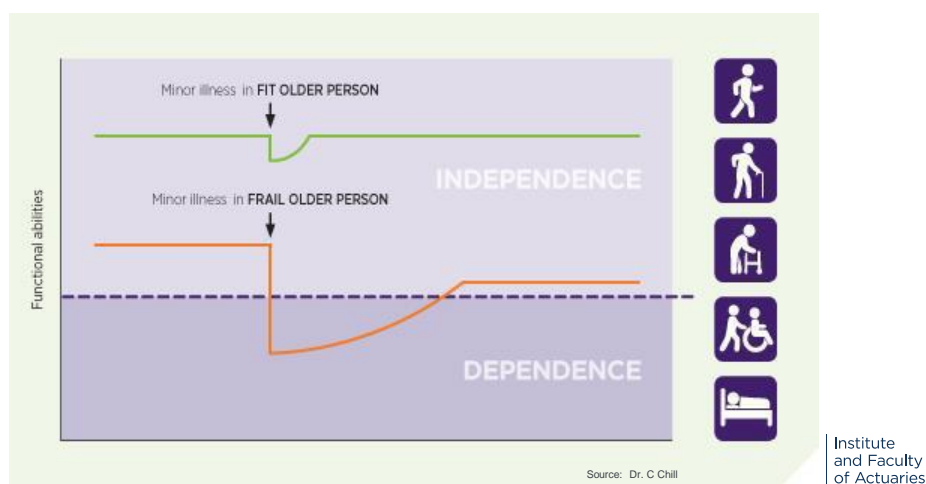
- Increasing frailty – reduced resilience and increased vulnerability – needs to be recognised as a long term condition
- The more things that go wrong the greater the risk of adverse outcomes
- Need to start to manage the general condition of age rather than each separate problem



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Clinical insight



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Blip or dip?



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?



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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





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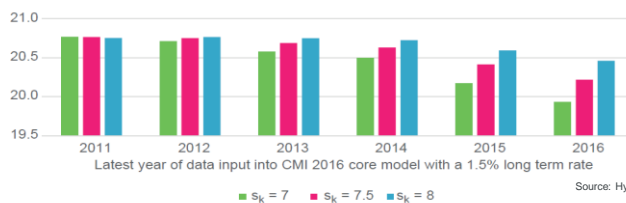
CMI16 mortality improvement model

05 October 2017

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

Male E&W Cohort Life Expectancy from age 65 at 1/1/14



Source: Hyman Robertson

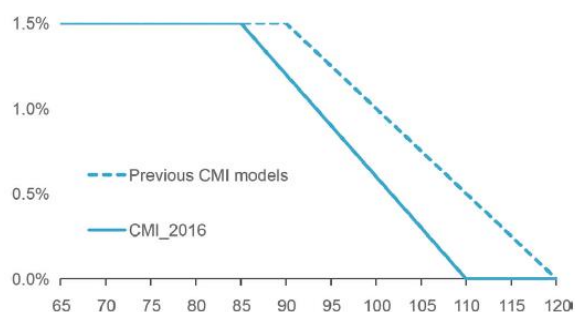


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CMI16 mortality improvement model

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

Long term improvements by age



Source: Hymans Robertson



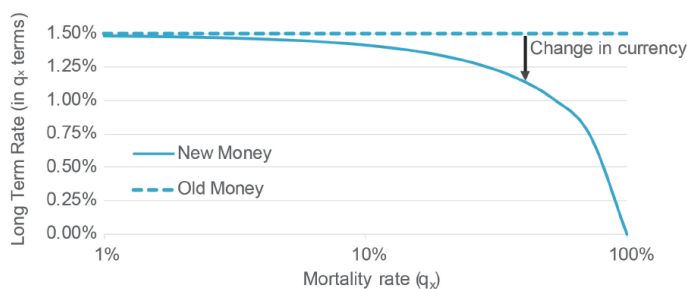
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CMI16 mortality improvement model

- Change to definition of improvements (from q_x to m_x)
- Risk that assumptions are unintentionally weakened

How much less valuable is a 1.5% long term rate now?



Source: Hymans Robertson



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Mortality trend by socio-economic class

Mortality 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?



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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 65-100).

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

Source: CMI Working Paper 97



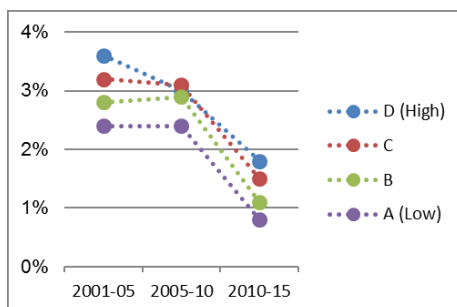
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Mortality by socio-economic class

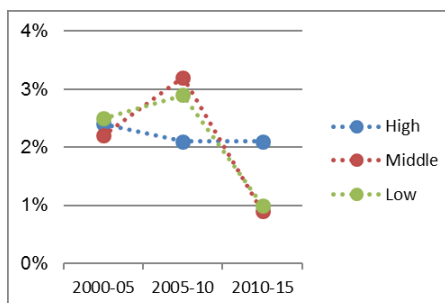
Annual male mortality improvement by socio-economic group

ONS data (by RGA)



Source: RGA analysis of ONS data

Club Vita dataset



Source: Club Vita / Hymans Robertson



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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



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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



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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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Questions



Comments

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