IAA Mortality Working Group: Sharing experience internationally

- Purpose: provide reference information and updates on mortality for actuaries worldwide
- Recent developments in MWG
- Recent developments elsewhere
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- Meetings
  
  http://www.actuaries.org/index.cfm?lang=EN&DSP=CTTEES_TFM&ACT=MEETINGS

- 6-monthly updates in various languages
  
  http://www.actuaries.org/index.cfm?lang=EN&DSP=CTTEES_TFM&ACT=UPDATES

- Information Base
  
  www.actuaries.org/mortalityinfo

IAA Mortality Working Group:
Meetings in year to April 2015

Country reports: Canada, Finland, Italy, Poland, USA, Japan, Netherlands

Research updates by members of MWG

- "Cause of death impacts on life expectancy" - Severine Arnold
- "Underwriting Around the World" - Al Klein
- "Longevity: Risk sharing solutions – future steps" - Ermanno Pitacco
- "International comparison of the cohort effect on mortality projections" - Dov Raphael
- "Mortality comparisons by country and behavioural drift" - Henk van Broekhoven
IAA Mortality Working Group: Meetings in year to April 2015

General updates on research internationally

- Social Security Programs in Canada
- USA individual insurance experience study process changes
- SoA International Experience Study
- Society of Actuaries initiative to create a longevity strategy taskforce
- Overview of nature of structured settlement products

External presentations

- “The Longevity Dividend Initiative” Jay Olshansky
- “Pension Mortality in Canada” Louis Adams
- “The CMI’s mortality improvement model” Tim Gordon
- “Projecting Mortality by Cause of Death” Peter Banthorpe
IAA Mortality Working Group: Meetings in year to April 2015

External presentations

- "The Longevity Dividend Initiative" Jay Olshansky
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- **Information Base**

  www.actuaries.org/mortalityinfo
IAA Mortality Working Group:
Information Base Subjects: 1

- Cause of death
- Disability and mortality
- Financial products
- Healthy longevity
- International Mortality Experience Study (Society of Actuaries)
- Other sources of information
- Pandemics

IAA Mortality Working Group:
Information Base Subjects: 2

- Pensions and annuity reserving assumptions
- Projection techniques
- Social and demographic stratification
- Sources of mortality data worldwide
- Trends and uncertainty
- Underwriting
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### IAA Mortality Working Group:
Recent developments elsewhere

- Mortality Assumptions and Longevity Risk: Implications for pension funds and annuity providers - OECD 2014
- Assessing Longevity Basis Risk - A Methodology
- *How do* longevity improvements differ?
- **Big data** in the life and health area
Mortality Assumptions and Longevity Risk
Implications for pension funds and annuity providers OECD Dec 2014

- OECD Benchmarking of Longevity Assumptions from 15 countries
  - Benchmarked against:
    - Lee-Carter,
    - Cairns-Blake-Dowd,
    - P-Splines and
    - CMI mortality.

15 April 2015
Slide courtesy Peter Banthorpe

- Overview of 15 countries mortality tables
- Trends in life exp. and mort. improvements
- Implications for pens & anny funds
- Measuring and modelling
- Assessing potential longevity risk in standard tables
- Policy options for managing longevity risk
Key findings (very abbreviated!)

- Regulatory framework:
  - Ensure appropriate mortality tables (relevant, timely, include improvement)
  - Incentives for management and mitigation of risk

- Governments should:
  - Facilitate measurement (accurate, timely, socio-economic)
  - Encourage development of hedging market
IAA Mortality Working Group:
Recent developments elsewhere

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- **Assessing Longevity Basis Risk** - A Methodology
  - *How do* longevity improvements *differ?*
  - *Big data* in the life and health area

Managing longevity risk in pension funds or life companies ….

- Can use hedging based on published mortality tables
- But published tables may differ, eg in social class or deprivation
- And mortality improvement rates may differ
- Framework to assess basis risk required
Basis Risk

- IFoA / LLMA sponsored research;
- Cass / Hymans Robertson research team;
- Extensive research on:
  - Historic trends
  - Two population models
  - Case studies

Choosing a method for modelling demographic basis risk
Key outputs of Basis Risk Research

- For ‘self-credible’ (big) books, recommends best 2-population models
- For modelling the majority of books which are not self-credible, gives an alternative “characterisation approach”
- Provides a decision tree framework to aid the selection of an appropriate methodology for assessing basis risk
- Emphasises importance of choice of time series underpinning any 2-population model

IAA Mortality Working Group: Recent developments elsewhere

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- How do longevity improvements differ?
- Big data in the life and health area
How do mortality improvements differ? (UK DB pensions)

- MA&PR (OECD): “high mortality improvements seem to be shifting to higher ages”

- ONS 2013: “The absolute inequality in mortality (between classes) narrowed over time, but the relative inequality increased, for both sexes”

- “Are UK DB Pensioners Different to the General Population?”

Pension Scheme Mortality Trends

NAPF/Club Vita

NAPF: National Association of Pension Funds

Club Vita: “Hymans Robertson’s sister company. It’s the only company dedicated to providing longevity services to occupational pension schemes in the UK. We work with over 100 of the UK’s biggest pension schemes”

Studying

2.5m pensioner records – around 2m person years of exposure in recent years (2005-2012)
Mortality differs by size of salary/pension
… which is a proxy for socio-economic class
But class is itself only a proxy
Given data held, it is possible to analyse by a variety of other factors
industry, occupation, affluence, socio-demographics

What matters?

The gap has narrowed
Pension Scheme Mortality Trends
NAPF/Club Vita

“Are DB Pensioners Different to the General Population?”
- In aggregate, and
- as three individual subgroups

Key Findings

- DB Pensioners experience differs from population
- .... and between different schemes
- Size of salary/pension and level of deprivation were key factors
- “Comfortable” - longer lived groups have seen slower increase in life expectancy
- “Hard pressed” have seen faster increase
- Could mean a 1% increase in liabilities
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Big health data in the UK
Prof. Harry Hemingway FFPH, FRCP
Director, Farr Institute of Health Informatics Research, UCL

- Longevity Symposium, UK, Sept 2014
- perspectives across the patient journey from linking multiple record sources

Big Data: Prof Harry Hemingway
Farr Institute of Health Informatics Research

Pace and scale of translation

- Discovery
- Public health and clinical decisions → health gain
- Big data / Health records
- Trials
- Outcomes & quality research
Big Data: Prof Harry Hemingway
Farr Institute of Health Informatics Research

How it will happen:
- Linking data: death registry, disease registry, hospital admissions, primary care
- Access to Biobank, CALIBER
- Building tools
- Developing capacities: in clinicians, awareness, training, building public trust, technical staff
- Curating data: eg Research-ready cohorts

Potential benefits:
- Discovering new risk factor associations
- Massive data for research
- Higher resolution epidemiology
- Research-ready groups
- Rapid evaluation of initiatives
- Understanding complexity (eg in disease pathways)
Finally – “news”

- **Antimicrobial resistance** - World's biggest killer by 2050?
- Craig Venter – [www.humanlongevity.com](http://www.humanlongevity.com/) “our goal is to extend and enhance the healthy, high-performance lifespan and change the face of aging”
- **Lancet Liver campaign** - “Mortality rates have increased 400% since 1970”
- **WHO** - 7 million premature deaths worldwide linked to air pollution. Air pollution is now the world's largest single environmental health risk
- **A proposal for the new MDGs**: avoiding 40% of premature deaths: 2010 - 2030

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**Daily Telegraph** 7 April 2015

**Alarm over sudden drop in female life expectancy**

- Official statistics show a drop in life expectancy for female pensioners, which experts say could be linked to cutbacks in care and lifestyle habits of baby boomers
- Life expectancy for women has suffered a drop on a scale not seen for decades, as their lifestyles become more like those of men, official figures show.
- In 2012 there were falls in average life expectancy for females in their 60s, 70s, 80s and 90s, new figures show.
- A drop in all such age groups had not been seen since 1995

**Recent Trends in Life Expectancy at Older Ages** February 2015

Public Health England
Figure 3. Trends in male life expectancy at ages 65, 75 and 85, selected EU countries,* 2003 to 2012

Figure 5. Trends in female life expectancy at ages 65, 75 and 85, selected EU countries,* 2003 to 2012

* EU countries with population over 35 million
Source: PHE analysis of data from Eurostat
Finally - a few hyperlinks

- IAA Mortality Working Group
  www.actuaries.org/mortality

- Update on Mortality developments in UK
  www.actuaries.org.uk/research-and-resources/documents/international-actuarial-association-uk-mortality-and-longevity-up-d

- IFoA Mortality Data Directory

- Continuous Mortality Investigation
  www.actuaries.org.uk/research-and-resources/pages/continuous-mortality-investigation

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Any comments or questions?