



## Continuous Mortality Investigation

Institute and Faculty of Actuaries

# Life Conference 2017: CMI Update

**James Tait**

Chairman of the CMI Executive  
Committee

**Vicky Webb**

CMI Annuities Committee

## CMI

CMI

- Wholly owned by Institute and Faculty of Actuaries
- Independent executive and management

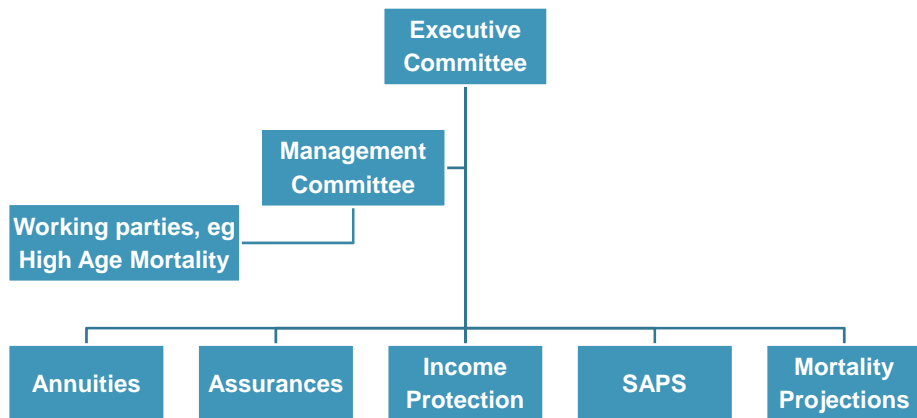
Funded by subscription but free for academics and non-commercial research

Mission

*To produce high-quality impartial analysis, standard tables and models of mortality and morbidity for long-term insurance products and pension scheme liabilities on behalf of subscribers and, in doing so, to further actuarial understanding.*

Our vision is to be regarded across the world as setting the benchmark for the quality, depth and breadth of analysis of industry-wide insurance company and pension scheme experience studies

## CMI structure



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## Annuities 2011-2014 results

**Vicky Webb**  
CMI Annuities Committee

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## Annuities Committee activity to date

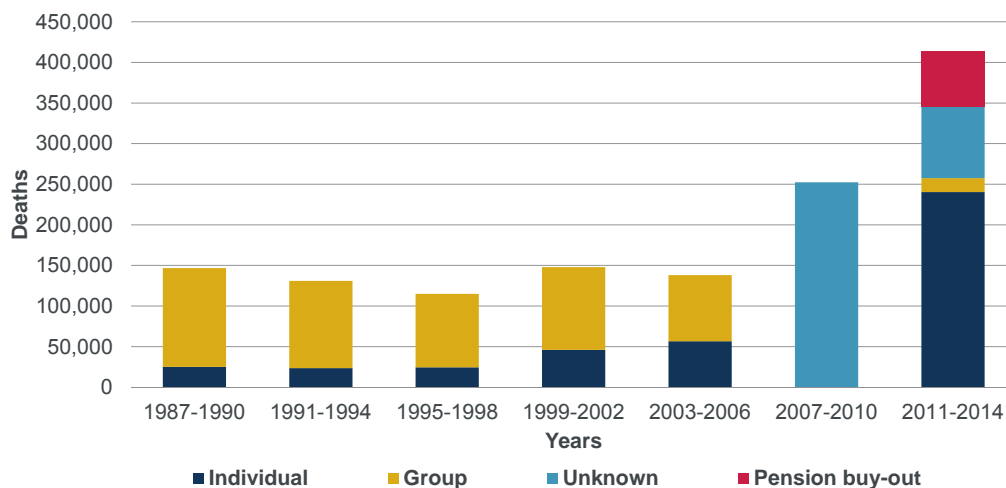
Date	Activity
October 2013	Experience report for 2007-2010 (WP70)
April 2015	Proposed "08" Series annuitant mortality tables released for consultation (WP78)
June 2015	Final "08" Series annuitant mortality tables released (WP81)
December 2015	Experience report for Enhanced Annuities in 2007-2010 (WP87)
July 2017	Experience report for 2011-2014 (WP101)
October 2017	Results of survey of data contributors

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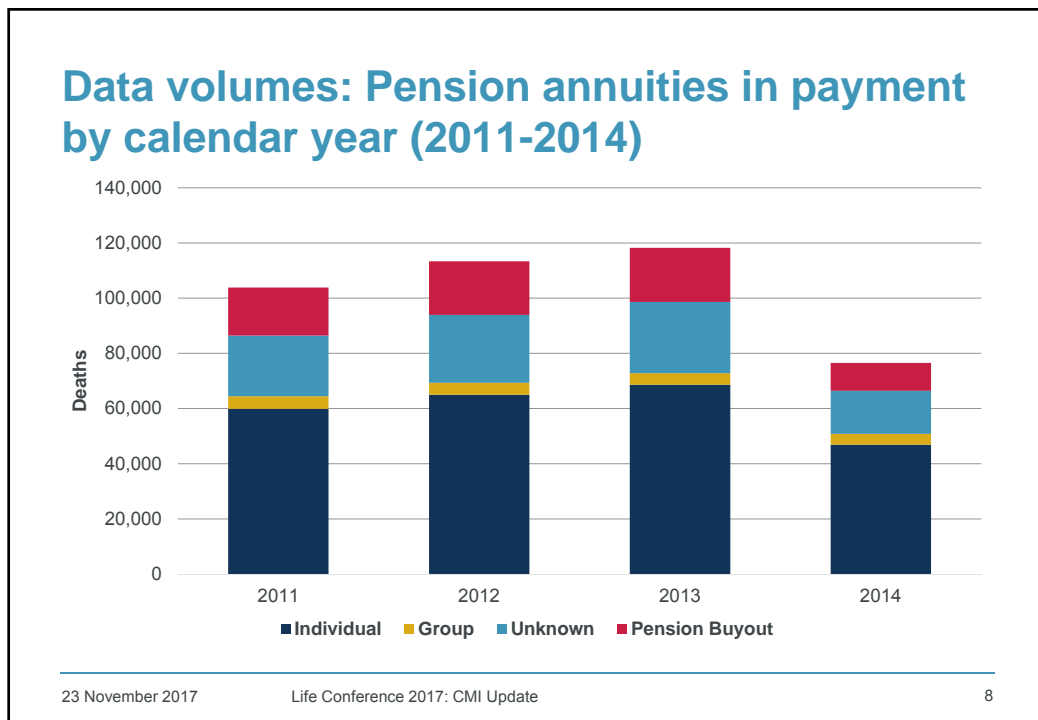
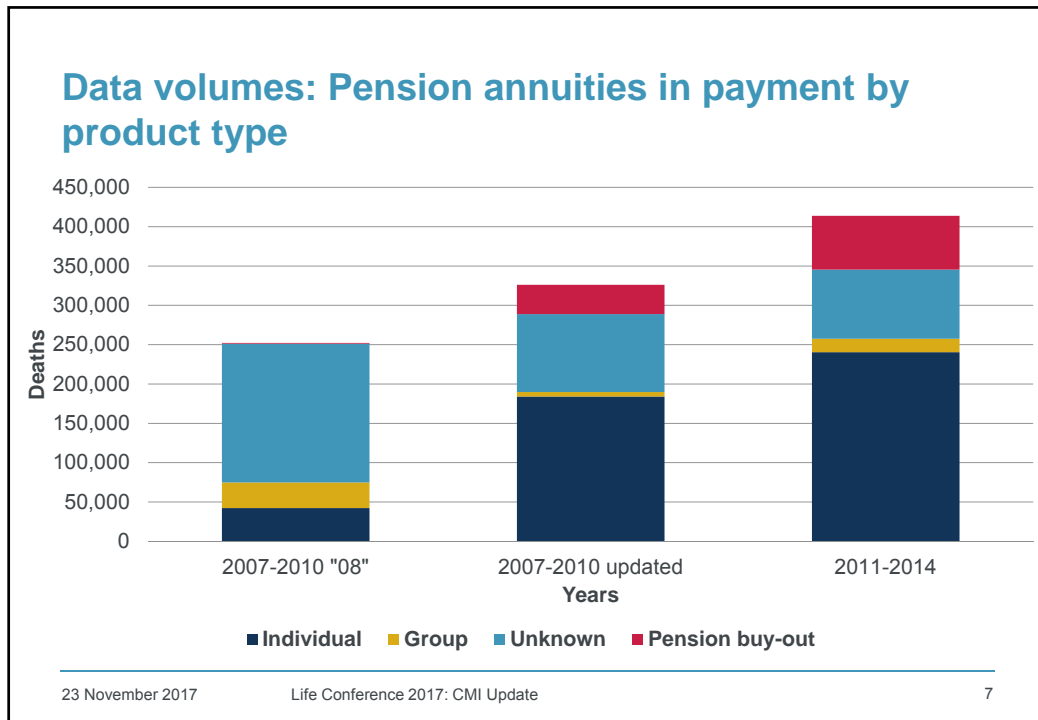
## Data volumes: Pension annuities in payment

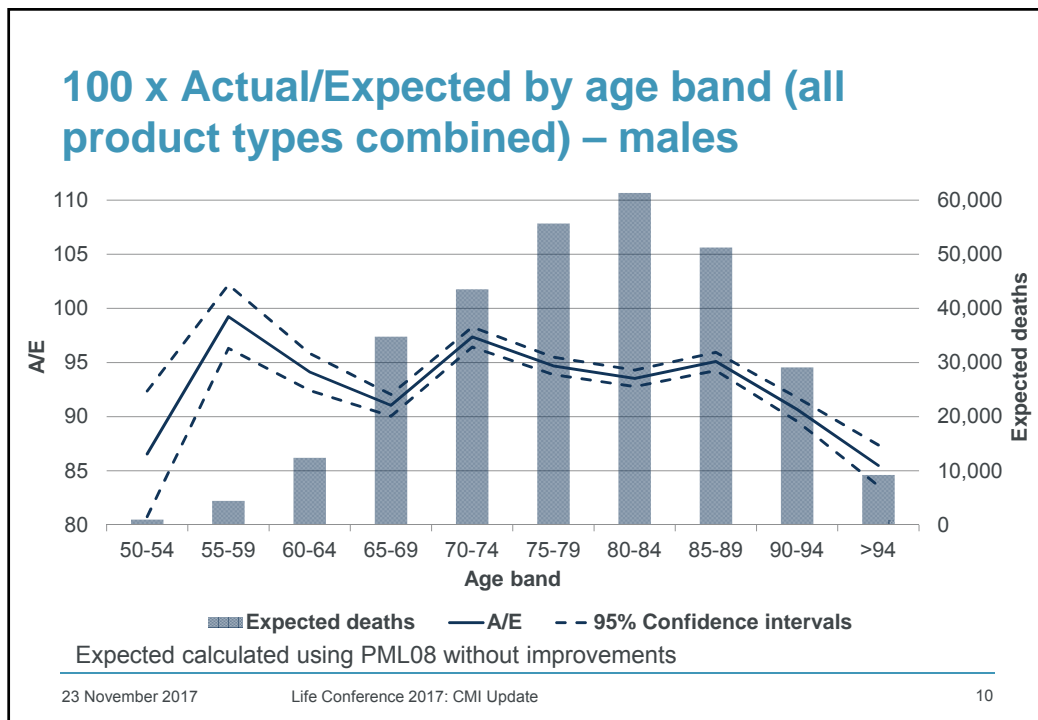
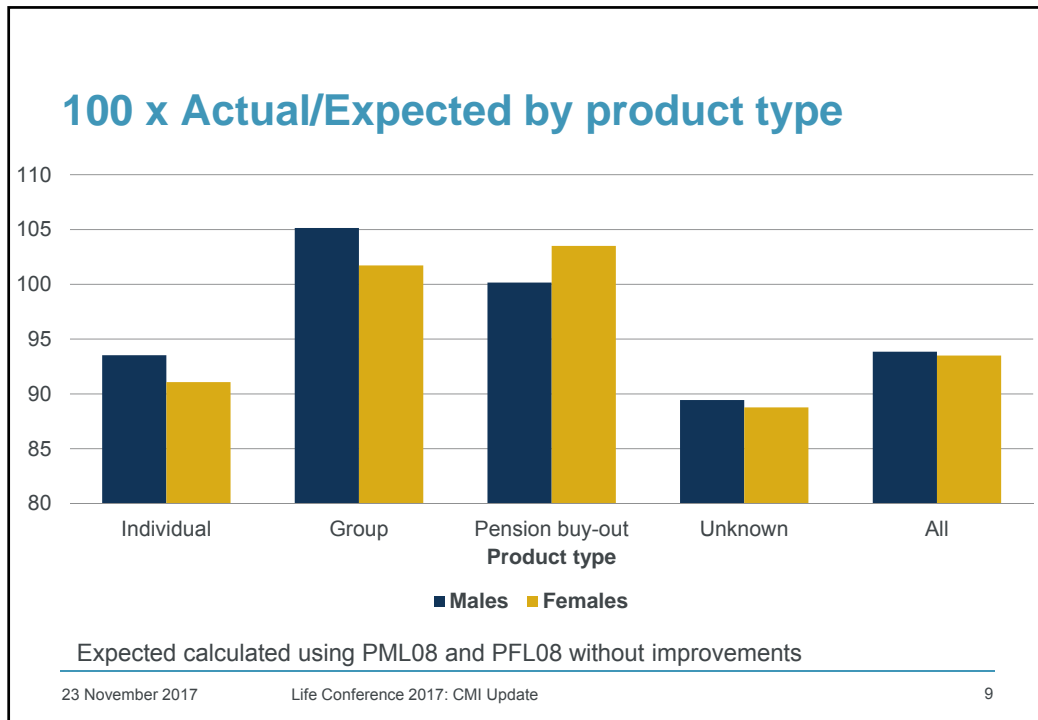


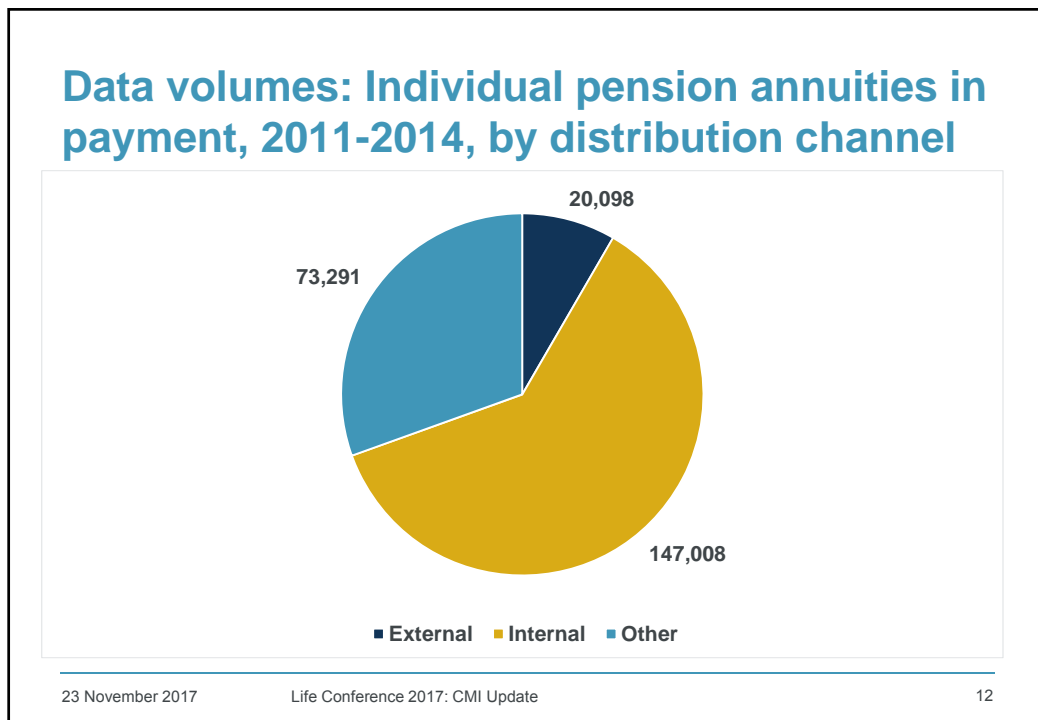
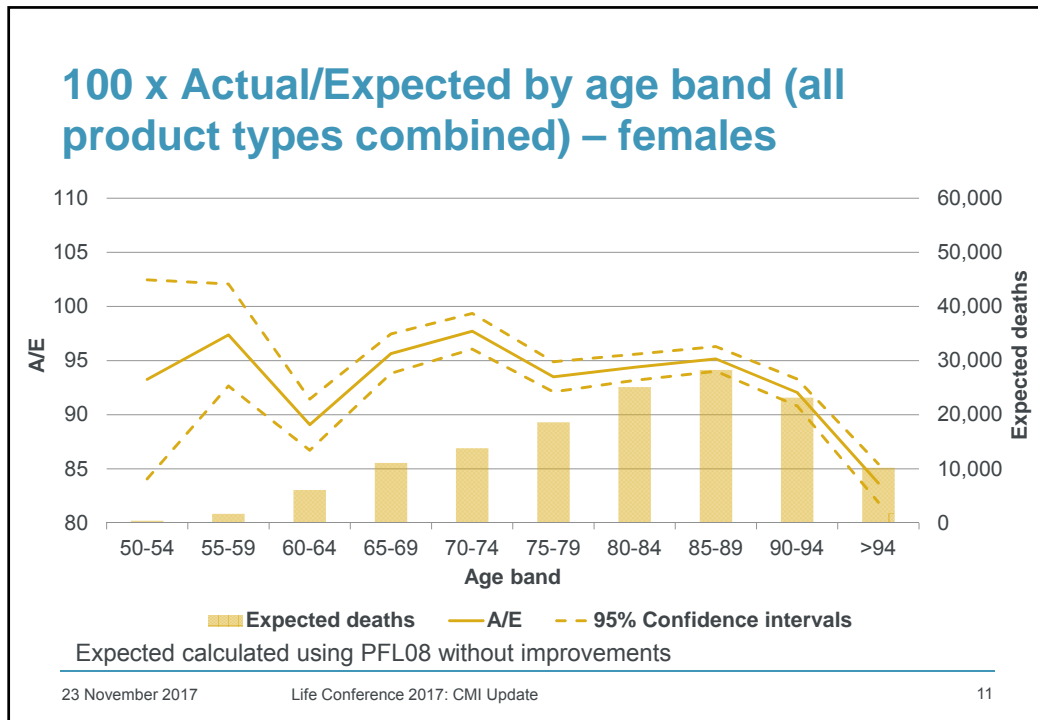
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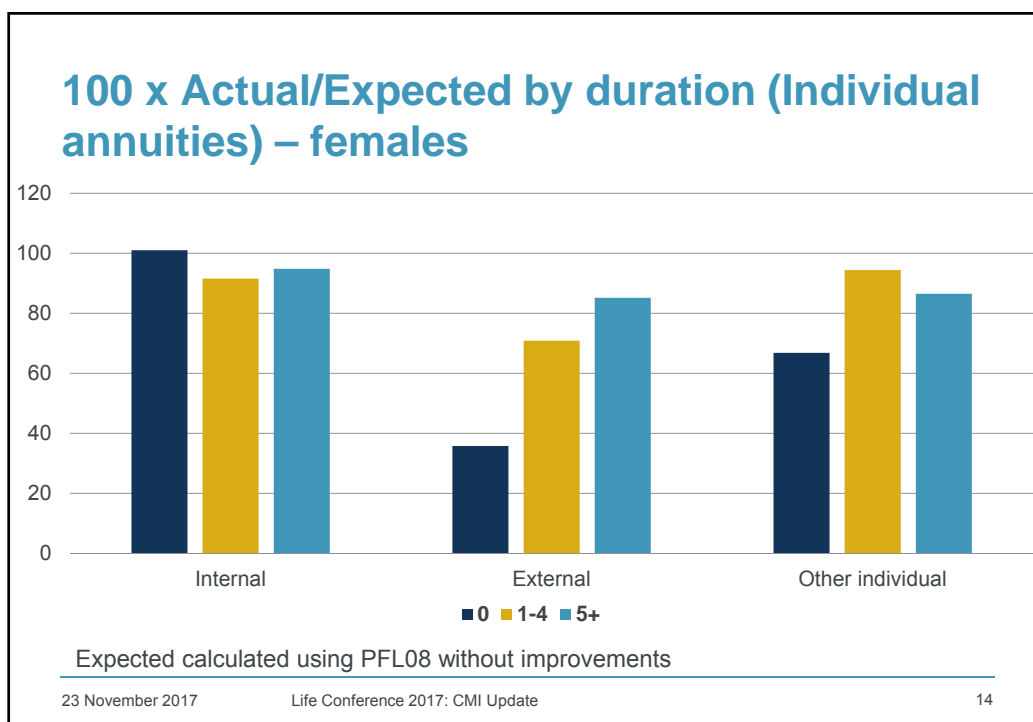
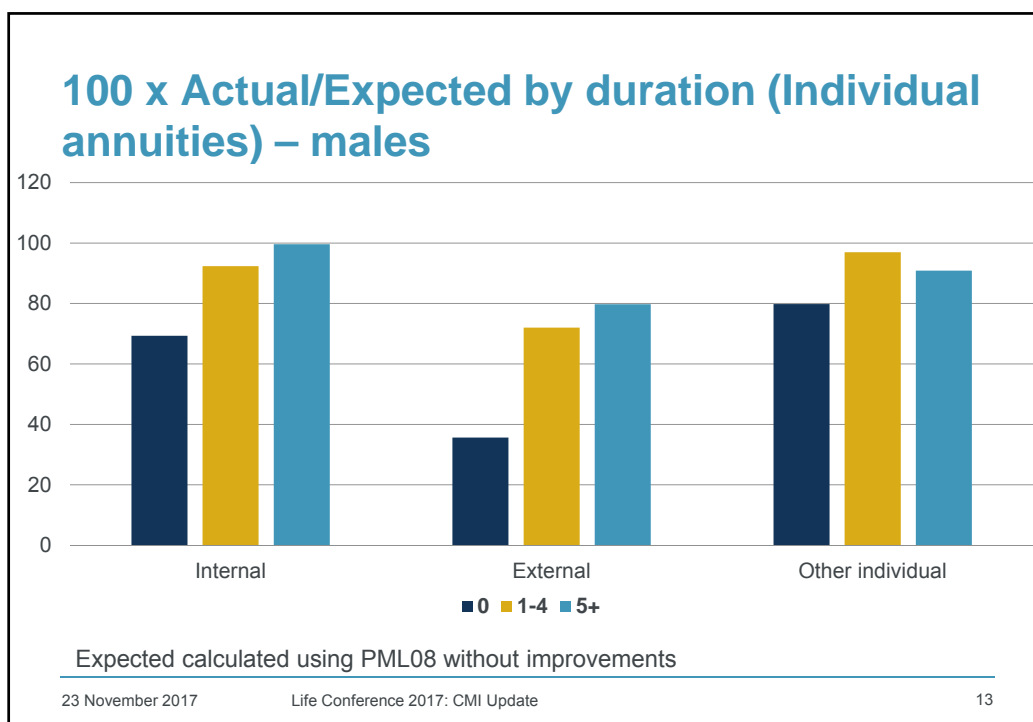
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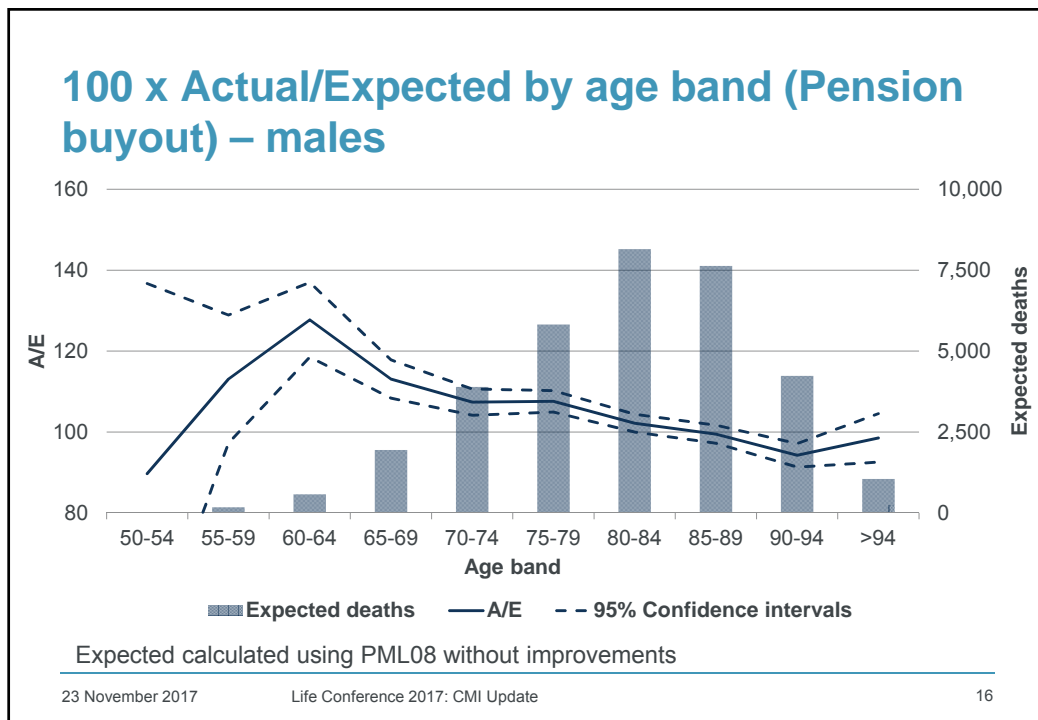
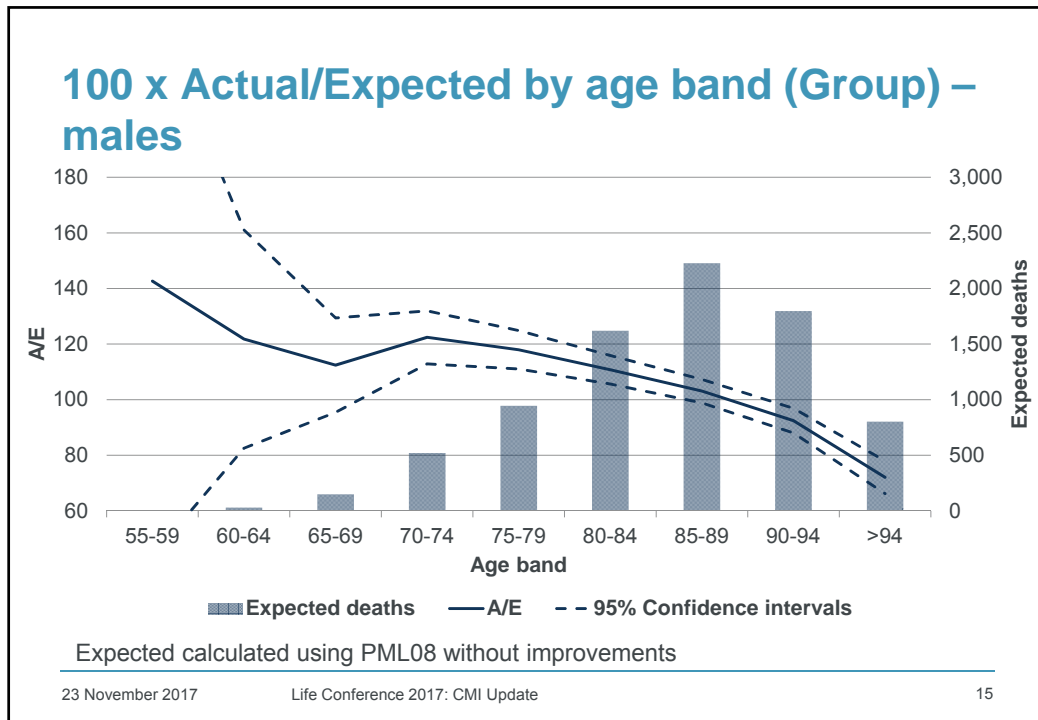
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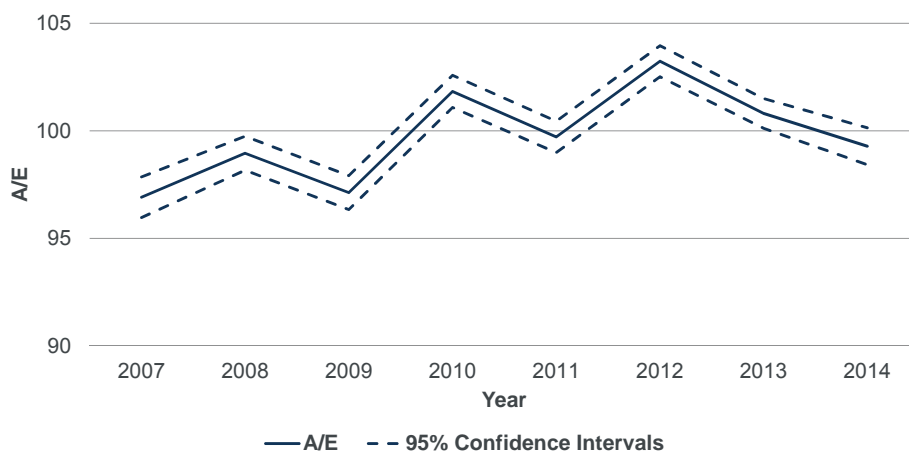








## 100 x Actual/Expected by calendar year for the updated 2007-2010 dataset and the 2011-2014 dataset – males



Expected calculated using PML08 with improvements

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## Results of survey of data contributors

- 16 Insurers surveyed – 10 responded
- Use of “08” tables
  - 5 using the “08” tables for calculating best estimate liabilities under Solvency II, 5 are not.
  - High Age – retain our original view, not to re-issue the “08” tables.
- Future data collection – survey respondents supported proposal to resume regular reporting of experience:
  - Annual reporting for pension annuities in payment; and
  - Quadrennial reporting for enhanced annuities, life annuities and deferred pension annuities.
- Further Work
  - Mixed responses with preference to focus on differentials by product type and collection of more recent data over analysis by socio-economic group.

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## What Next?

### Data Collection

- We are aiming to collect up-to-date data by the summer of 2018
- Request insurers to submit data for the years to 2017 no later than 31 July 2018 (preferably sooner).
- If we receive data to this timetable, then our aim would be to report on experience in 2011-2016 in Q4 2018.

### Further analysis

- Generalised Linear Modelling (GLM) of the extended 2007-2014 dataset.
- Consider graduations of the 2011-2014 dataset; in particular incorporating product type and durational effects.



## Assurances Committee update

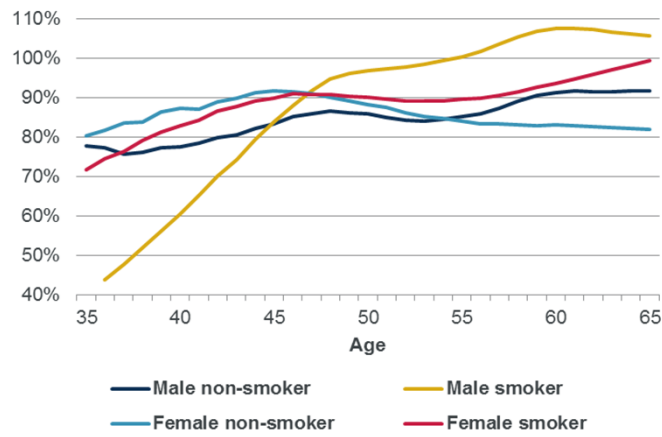
## Assurances Committee activity

Date	Activity
December 2014	Experience report for 2007-2010 (WP75)
May 2016	Proposed "08" Series accelerated critical illness tables released for consultation (WP89)
October 2016	Proposed "08" Series term assurance mortality tables released for consultation (WP92)
January 2017	Final "08" Series accelerated critical illness and term mortality tables released (WP94)
October 2017 -	Processing data submissions for 2011-2016
Early 2018	Experience report for 2011-2016

## Summary of key features of "08" Assurances tables

- New tables for Term mortality and ACI only (no tables produced for Term SCI, Endowment, or Whole of Life)
- T08 tables graduated using an age range of 35-75, AC08 use 35-65
- Extensions down to age 18 and up to age 90
- Select rates derived using analysis of A/Es for shorter durations
- GLM analysis of Term mortality revealed:
  - Significant variation by office (+/- 20% even for large offices) – beyond those arising from statistical volatility – not explained by other factors.
  - High sums assured (over £125,000) exhibit lighter experience than the graduated rates.

## Comparison of ultimate T08 rates with the "00" Series rates



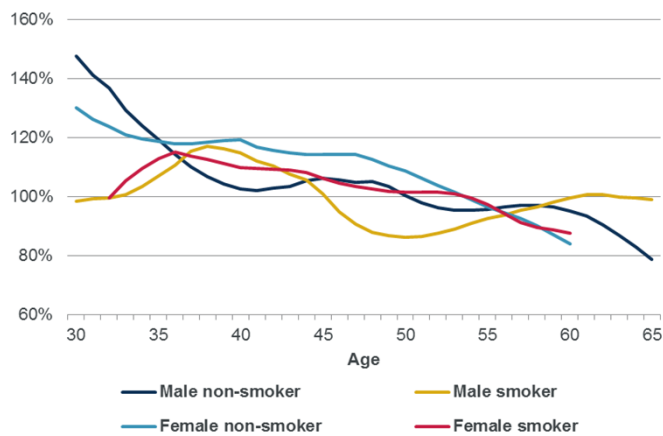
Note: the "00" Series rates have been projected to a consistent date using the smoothed improvement rates from CMI\_2015.

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## Comparison of ultimate AC08 rates with the AC04 rates



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## Future work

- Priority is to get data collection up-to-date and issue 2011-2016 “all offices” results
- Other potential developments include:
  - Analysis of mortality under whole of life contracts
  - Stand-alone critical illness tables
  - Lapse analyses
  - Analysis by socio-economic status
  - Cause of Claim analysis
  - Analysis of experience of rated cases.

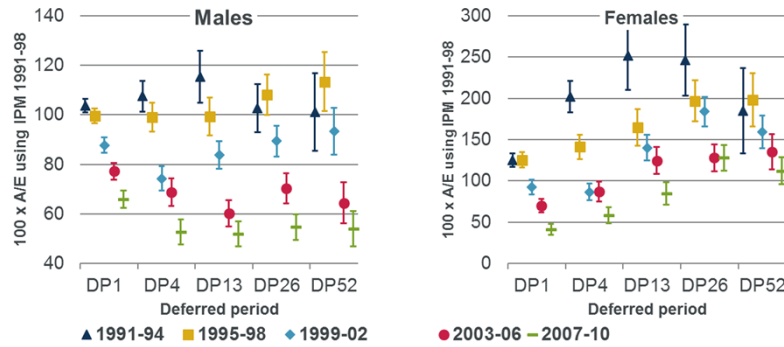


## Income Protection Committee update



## IP experience – inceptions

Claim inceptions experience (100 A/E) by quadrennium, sex and deferred period, occupation class 1



- Lighter inceptions experience in 2007-2010 continued downward trend

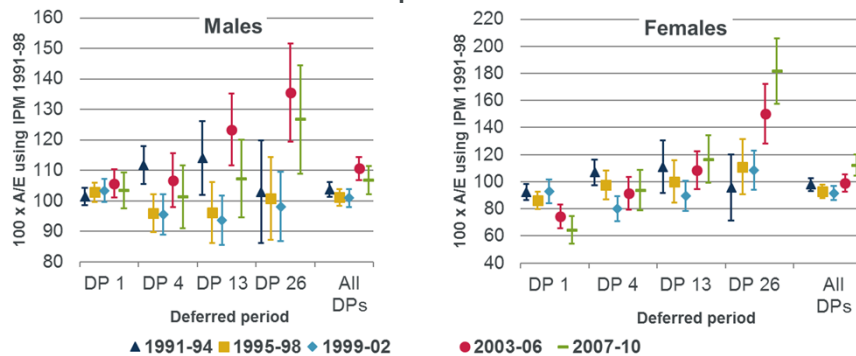
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## IP experience – terminations

Claimant recovery experience (100 A/E) by quadrennium, sex and deferred period, occupation class 1



- Lighter inceptions experience in 2007-2010 continued downward trend

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## IP experience by other factors

- Analysis performed on experience by benefit amount and by policy duration (data collected but not used in regular analyses)
- Larger amounts -> lighter inceptions experience (males)
- Some evidence of smaller amounts -> higher recovery rates (M & F)
- Lower inception rates at short policy durations (M & F)
- Little evidence of policy duration affecting recovery rates



## Life insurer data collection

## Life insurer data collection

- We are keen to improve the flow of data into CMI so that we can return to regular reporting
- We have provisionally agreed the high-level data prioritisation shown below:

	Status of 2007-2010 data	Status of 2011-14 data	Target date for next data	Next focus for data collection
Annuities	Issued and graduated	Results issued	31 July 2018 for data to 2017	2015-18
Assurances	Issued and graduated	Some gaps in the data	30 Sept 2017 for data to 2016	2011-16 (then 2017-2020)
IP	Issued and graduations at preparatory stage	Material gaps in the data	31 Dec 2017 for data to 2016	2011-16 (then TBA)

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## High Age Mortality Working Party update

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## Working Paper 100 (June 2017)

- Shape of mortality at high ages
  - On balance, evidence supports old-age deceleration (not Gompertz)
  - Assumption of  $\mu_{120} = 1$  is justified
- High-age extensions of graduated tables
  - New method proposed – convergence to national population mortality
  - Illustrative examples published for SAPS S2 and Annuities 08 Series
- Exposure modelling for England & Wales
  - ONS currently applies Kannisto-Thatcher method from age 90
  - HAMWP proposes implementation of K-T method at a younger of 85
  - Further refinements include: explicit allowance for mortality trend and addressing abnormal cohort exposures.
  - Reduces life expectancy at 95 by 2% for males, and 1% for females
- Next steps – discussing use for future CMI tables

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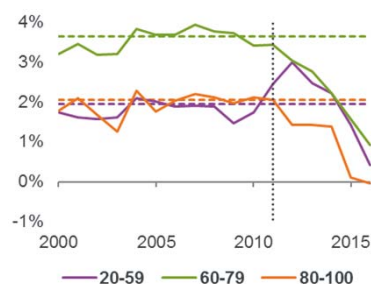
## Mortality Projections Committee update

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## CMI\_2016 (March 2017)

- Same principles as earlier versions, but changes in method:
  - More transparent and useable, faster, pure Excel/VBA
  - Ability to control the “responsiveness” to new data
- Lower life expectancy (LE) than CMI\_2015 due to low *national population* mortality improvements
  - Age 65 male: LE 1.3% lower
  - Age 65 female: LE 2.0% lower

**Five-year average mortality improvements by age band  
(Males, England & Wales)**



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## CMI\_2016 (March 2017)

- Basis risk – different improvements in different populations
  - CMI SAPS had higher improvements (2011-15) than England & Wales
  - IMD data shows higher improvements (2001-15) for less-deprived areas
  - PLSA model shows steadier improvements (2000-15) for higher classes
- Next version (CMI\_2017) due in March 2018

**Mortality improvements  
SAPS versus England & Wales  
(Ages 65-100, years 2011-2015)**

Population	Male	Female
E&W	-0.1%	-0.9%
SAPS lives	+1.2%	+1.8%
SAPS amounts	+0.4%	+2.6%

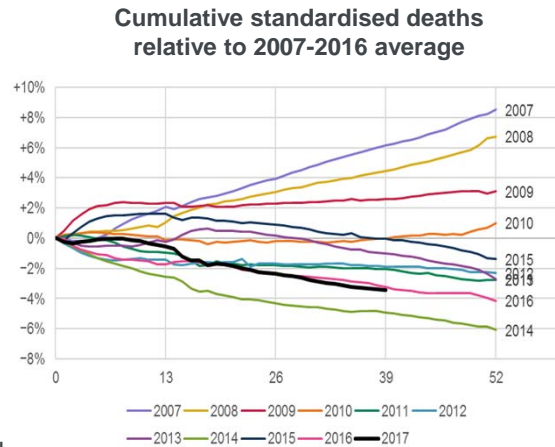
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## Mid-year update (November 2017)

- Working Paper 103 provides analysis to help users of the Model
- Mortality improvements continue to be low
  - Deaths for weeks 1-39 of 2017 similar to 2016 after allowing for population changes
- Extended analysis of SAPS mortality improvements
  - SAPS higher than general population in 2007-11 as well as 2011-15



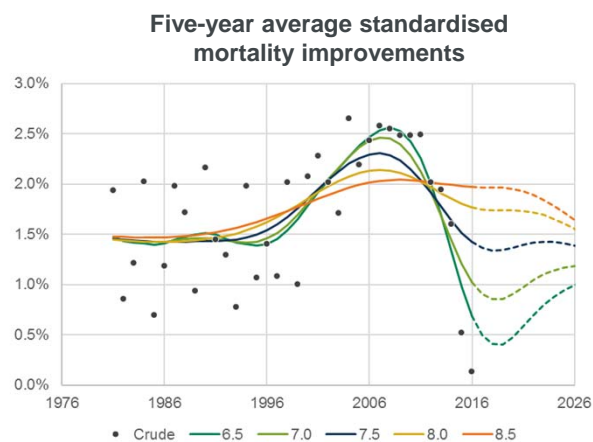
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## Mid-year update (November 2017)

- Impact of period smoothing parameter on historical and projected mortality improvements
- International data
  - Software can easily use international data (Human Mortality Database)
  - E&W results compared to UK and overseas



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# SAPS Committee update

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## SAPS Committee activity

Date	Activity
November 2015	Investigation into mortality experience by industry classification of SAPS pensioners for the period 2006-2013 released (WP86)
February 2016	Mortality experience of SAPS pensioners for the period 2007-2014 released (WP88)
February 2017	Mortality experience of SAPS pensioners for the period 2008-2015 released (WP95)
30 June 2017	Deadline for data submissions to be included in "S3" Series dataset
December 2017	Mortality experience of SAPS pensioners for the period 2009-2016 expected to be released
April 2018	Proposed "S3" Series mortality tables expected to be released for consultation

## And finally...

- We are currently advertising a role on the Executive Committee – see the [Volunteer vacancies page on the IFoA website](#)
- GDPR is on the horizon and we are actively considering what changes may be needed for CMI
- Changes to subscriptions for life insurers needed for Solvency II
- “Briefing notes” for key outputs are planned
- Surveys:
  - Past “requests for feedback” have generated limited response
  - Survey of Annuities data contributors provided very useful input
  - “400 Club” also provided wider range of views
  - A survey of all subscribers is planned for 2018
  - Your feedback is important!!



Questions

Comments

The views expressed in this presentation are those of the presenter.

Please send any questions, views or feedback to  
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