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## Continuous Mortality Investigation

Gordon Sharp – Chairman, CMI Executive Committee  
Mortality and Longevity Seminar 2013



27 June 2013

### Agenda

- Changes to CMI structure and funding
- Mortality Projections: CMI\_2012 and consultation
- SAPS
- Life Office Mortality



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## The CMI Review – why?

- Risks borne by Actuarial Profession – and not understood
- CMI funding basis had inherent flaw:
  - Voluntary financial contributions
  - Output freely available



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## CMI Limited

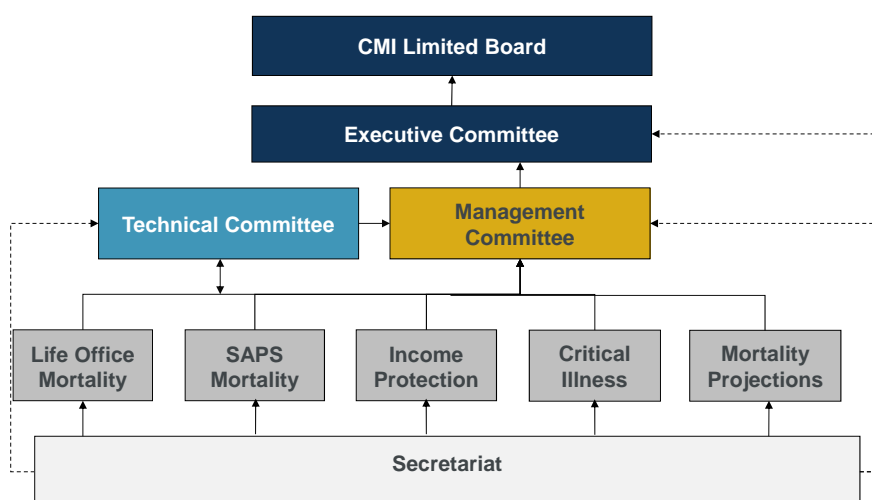
- New UK private company, CMI Limited:
  - Limited by shares
  - Wholly owned by the Institute and Faculty of Actuaries
  - Company number: 8373631
- Board of directors:
  - The Chief Executive of the I&FoA (Derek Cribb); and
  - A nominated member of the CMI Executive Committee (Peter Banthorpe)
- Risks borne by CMI Limited
- Revised funding basis
- Outputs only available to fee-payers



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## Structure of CMI Ltd



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## CMI Limited - Key changes for users

### Subscriptions

- Structure modified for existing contributors:
  - Life insurers now based on reserves on annuities in payment + capital at risk
  - Reinsurers now flat fee (£20,000 p.a.)
  - Consultancies – small increase in fees for 2013/14 plus new “per actuary” fee introduced for very small firms: £250 per qualified actuary per year

### Registration system

- Full outputs – e.g. working papers – accessible only to registered users
- All actuaries at existing firms have been pre-registered (normal log-in details for the IFoA website)
- Use subject to Terms & Conditions

Any questions please e-mail [info@cmilimited.co.uk](mailto:info@cmilimited.co.uk)



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## CMI\_2012

- Release of CMI\_2012 deferred to await revised population estimates (mid-2002 to mid-2010) following the 2011 Census.
- ONS published the revised estimates in December 2012:
  - Changes vary significantly by age (typically greatest for ages 10 to 39)
  - For the highest ages (90+), significant reductions to the population estimates (particularly for males).
- CMI\_2012 published in February 2013 alongside Working Paper 63
- Core Projections produce lower expectations of life (generally!) than those produced by CMI\_2011 (most significant reductions for males age 80+, driven by the revisions to population estimates)

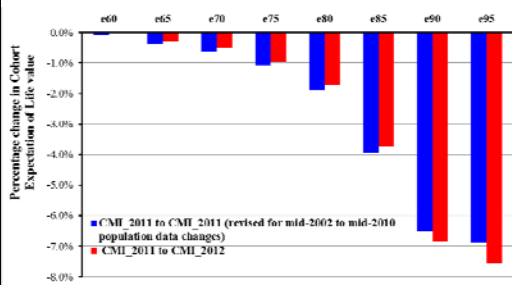


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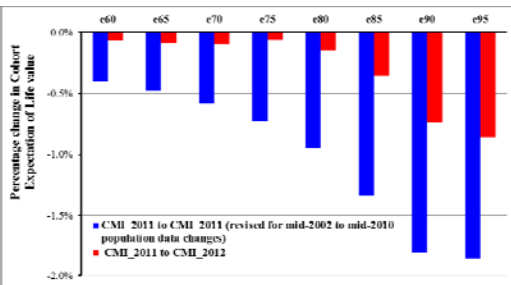
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## CMI\_2012

Percentage change in Cohort Expectation of Life Value compared with CMI\_2011; Males



Percentage change in Cohort Expectation of Life Value compared with CMI\_2011; Females



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## Consultation

- CMI Working Paper 64, released in April, consulted on:
  - Structure and parameterisation of CMI Mortality Projections Model
  - Future of the Library of Mortality Projections
  - Further research and projection tools that the CMI should consider
- 10 responses received; mixture of insurers and consultancies

### Library of Mortality Projections

- Paper proposed to cease updating the Library; majority of respondents in favour of continuing
- ONS projections particularly valued
- Likely to retain in current form and update annually



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## Consultation

### CMI Mortality Projections Model

- Widespread support for the Model
- Principal concern surrounded convergence; Committee will investigate alternative approaches
- Charts, etc not always required – may issue a slimmer version.

### Other Research

- Reasonable support for cause of death model and socio-economic/postcode analyses
- Some support for future research on Stochastic models
- Points raised will be discussed by the CMI and the Mortality Research Steering Group



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- **SAPS**
- Life Office Mortality



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## SAPS Mortality Investigation

### SAPS = Self-Administered Pension Schemes

- Data collection commenced in Jan 2003 following pilot scheme.
- Pension scheme mortality shown to be different from experience underlying insured pensioner population.
- Became formal CMI investigation in July 2006
- Produces individual analyses on all scheme data submitted
- Analyses aggregate SAPS dataset approx annually, including features of different:
  - pensioner types
  - industry types
  - pension amounts bands etc.
- Produces mortality tables (“S1”, “S2”, etc) based on pension scheme data



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## 2004-2011 mortality experience: overview

- CMI Working Paper 65 was issued to subscribers in April
- Increase in the volume of data – approximately 8% increase in exposure over latest 8-year period
- PPF data was included for the third time
- Same dataset used for “S2” Series

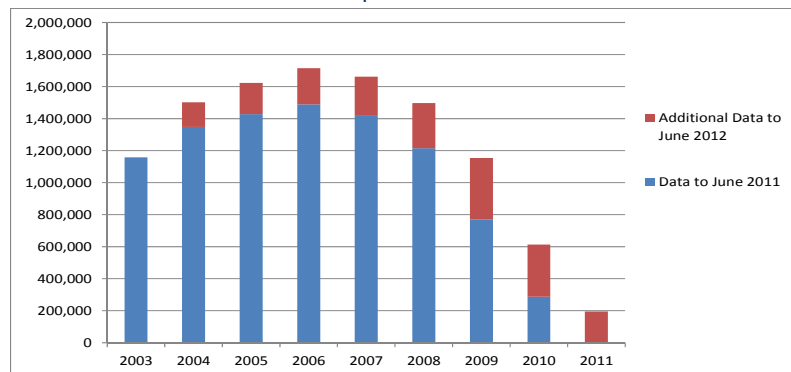


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## 2004-2011 mortality experience: data by year

Male pensioners



N.B. Additional data for 2003 may have been submitted up to June 2012 but analysis only covered 2004-2011. Similarly some 2011 data may have been submitted up to June 2011 but the analysis only covered 2003-2010.

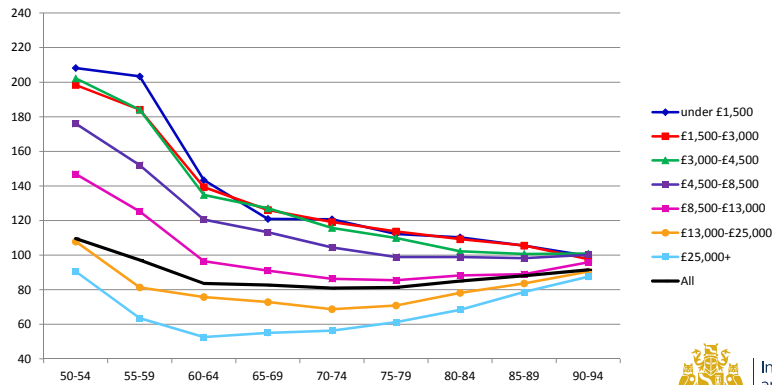


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2004-2011 mortality experience: amounts bands

Male Pensioners Amounts compared against S1PMA

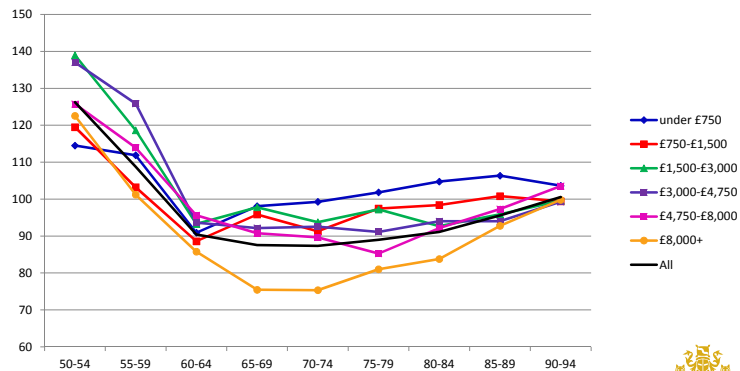


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2004-2011 mortality experience: amounts bands

Female Pensioners Amounts compared against S1PFA



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## “S2” Series: Summary of “S1” Series

### “S1” tables recap

- Covered the period 2000-2006, data submitted by 30 June 2007
- Designated mid-point for  $\mu_x$  of 1 March 2003
- 20 different tables produced:
  - Male and female pensioners
  - Female dependants
  - Normal health and ill-health
  - Heavy and Light (for some categories)
- Gompertz-Makeham graduation approach



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## “S2” Series: Summary of “S2” Series

### “S2” tables summary

- CMI Working Paper 66 was issued to subscribers in April
- Covers the period 2004-2011, data submitted by 30 June 2012
- Designated mid-point for  $\mu_x$  of 1 March 2007
- Tables proposed:
  - Male and female pensioners
  - Female dependants
  - Normal health and ill-health
  - Heavy, Middle and Light (for some categories)
- Gompertz-Makeham graduation approach



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## “S2” Series: Proposed tables

Pensioner type	“S1” Series	Proposed “S2” Series
All pensioners	Males/Females Lives/Amounts Amounts: Light/Heavy	Males/Females Lives/Amounts Amounts: Light/Middle/Heavy
Normal Health	Males/Females Amounts only Amounts: Light/Heavy	Males/Females Amounts only Amounts: Light/Heavy
Ill-health	Males/Females Amounts only	Males/Females Amounts only
Combined	None	None
Dependants	Females only Lives/Amounts Amounts: Light/Heavy	Females only Lives/Amounts Amounts: Light/Heavy
Unknown	None	None



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## “S2” Series: Consultation

- CMI Working Paper 66 consults on various aspects of “S2” Series, including:
  - Whether the graduations should be adjusted to a particular date, using CMI\_2012
  - Naming convention
  - Introducing ‘Middle’ tables between ‘Light’ and ‘Heavy’
  - Extensions to younger and older ages
  - Limiting the tables at age 120
- 10 responses received; 8 consultancies and 2 insurers
- Very mixed responses – For discussion at Committee meeting (24<sup>th</sup> June)



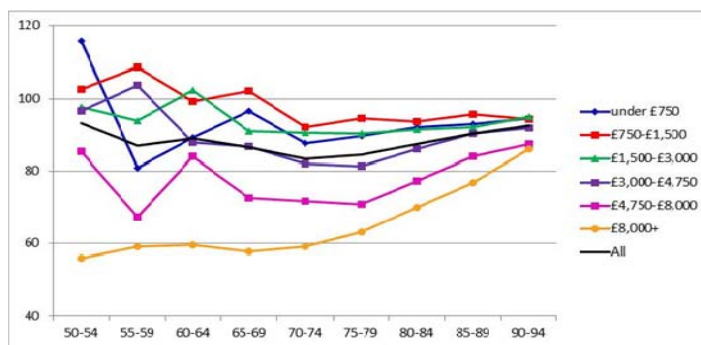
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## “S2” Series: Not producing Light and Heavy graduations for Female Dependants

100A/E values for Female Dependants Lives compared to S1DFL



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## Life Office Mortality Investigation

- Longest running – from the 1920s
- Data from UK life offices
- Assurances, annuitants & pensioners
- Smoker / Non-smoker
- Graduated mortality tables
- (Impaired lives)



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## Per Policy: Aims

- In recent years the CMI has been switching to 'Per Policy' data collection for life office mortality and critical illness data.

### Aims

- Capture more detailed information
- Improve accuracy
- Allow different analyses



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## CMI Life Office Mortality & Critical Illness 2007-2011 data collection exercise

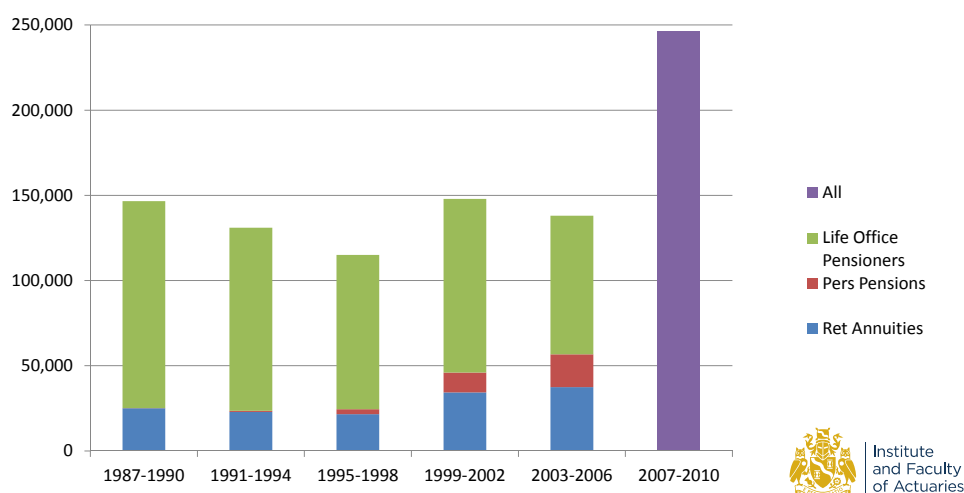
- Considerable concern over data collection:
  - Slow progress to Per Policy – data requirements over-ambitious;
  - All Office results out of date; and
  - Fall in market coverage for Life Office Mortality
  - Compounded by limited resources in offices (Solvency II etc)
- 2007-2011 data collection exercise – Mortality & CI
- Flexible data requirements – what data can you provide?
- Intended to make data submission as easy as possible
- Annuity data volumes initially most encouraging
- Hope to release 2007-2010 results this summer



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## Annuities – Data Volumes



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## Questions

## Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

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

Any queries or feedback should be sent to:

[info@cmilimited.co.uk](mailto:info@cmilimited.co.uk)



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