UK Mortality and Longevity Update v2
September 2014 Brian Ridsdale

Note: the referenced articles come from a variety of sources in the UK and elsewhere, and I have included them because I think they are interesting. Thanks to all the people who have contributed. If you have any comments or further news, please email me – address at bottom.

Update v2 includes a few additional items that I think are worth including now, marked ∆.

Some papers are firewalled, but members of the Institute and Faculty of Actuaries (IFoA) can access many (marked *), including those in the North American Actuarial Journal and the Annals of Actuarial Science, via the Athens information portal. Details here.

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1 UK papers, presentations and articles

1.1 Continuous Mortality Investigation

Version 1.5 of the CMI Library of Mortality Projections was released in August 2014. This contains 20 additional projections, including projections using the P-spline age-cohort and Lee-Carter models applied to ONS data to 2012, the ONS 2012-based National Population Projections and the ONS 2010-based National Population Projections for the UK; Note: this version of the Library is available to Authorised Users only.

The CMI has completed the change in structure of the Life Office Mortality and Critical Illness Committees into an Annuities Committee and an Assurances Committee.

The Assurances Committee presented A critical update - CMI CI results at the Health and care conference on 23 May 2014 which considered 2007-2010 draft results.

CMI Working paper 72 was published in April 2014. This paper analyses individual income protection experience, 1991-2009, by cause of sickness. The accompanying spreadsheet contains two databases, covering inceptions and terminations experience, to enable practitioners to pursue further investigations.
The Committee also released the CMI Income Protection Rate Table Tool in April 2014. This is a spreadsheet-based application, designed to assist practitioners in deriving claim inception and termination rates, as well as other factors, such as claim annuity values. It is intended to help practitioners make full use of the published graduations (SM1975-78 and IPM 1991-98) and experience.

**Self-administered pension schemes (SAPS) mortality: Working paper 73**, published in July 2014, presents an analysis of the mortality experience of data received by 30 June 2013, covering the period 2005 to 2012. Note: This paper is available to Authorised Users only.

The CMI has produced a set of unisex rates that are intended for actuaries undertaking statutory valuations and illustrations where these are required.

### 1.2 Office for National Statistics

**ONS looks at leading causes of deaths registered in England and Wales, 2012**

In 2012, The leading cause of death for men was heart disease (15.6%) and the leading cause for women was “dementia and Alzheimer’s disease” (11.5%). 46% of men and 64% of women who died were aged 80 or over. “Dementia and Alzheimers” (a single category) only appears in the top three causes for people in this age range, where it is first for women and second for men.

**Inequality in Healthy Life Expectancy at Birth by National Deciles of Area Deprivation: England, ONS 2010-12**

Males in the most deprived areas have a life expectancy 9.1 years shorter (when measured by the range) than males in the least deprived areas; they also spend a smaller proportion of their shorter lives in ‘Good’ health (70.8% compared to 85.0%). Females in the most deprived areas have a life expectancy 6.8 years shorter than females in the least deprived areas; they also expect to spend 17.2% less of their life in ‘Good’ health (66.1% compared to 83.2%).

**Avoidable Mortality in England and Wales, ONS 2012**

Deaths from potentially avoidable causes accounted for approximately 23% of all deaths registered in England and Wales in 2012. The leading cause of avoidable death was ischaemic heart disease in males and lung cancer in females. In 2012, these conditions represented 22% and 15% of all avoidable male and female deaths respectively in England and Wales.

The National Statistician made a recommendation on 27 March 2014 about the census and future provision of population statistics in England and Wales.

The Government has now responded, welcoming the recommendation for a predominantly online census in 2021 supplemented by further use of Administrative and Survey data, It recognises that the public must be assured of privacy and confidentiality with the use of administrative data for statistical purposes, and has launched an open policy making process.
The UK Statistics Authority and the Government have both responded to the Public Administration Select Committee's report 'Too soon to scrap the Census'.

1.3 City University


1.4 Heriot Watt


1.5 Other

On the difficulties of estimating cohort effects (Iain Currie)

Some inappropriate models to use for mortality projections (Stephen Richards)

Why some other useful models cannot be fitted in Excel (Stephen Richards)

Forecasting with cohorts (Iain Currie)

Why buy-outs can be cheaper than they seem (Allan Martin)

Some rapid shifts in the composition of defined-benefit pension schemes in the U.K. (Stephen Richards)

Some creative thinking from the BT pension scheme (Stephen Richards)

A presentation on the role of smoothing in actuarial work (Stephen Richards)

A presentation to actuarial students on the role of longevity risk (Stephen Richards)

Mis-estimation risk: measurement and impact (Stephen Richards), concerns the capital allowance insurers should make for the mis-estimation of current mortality rates in their regulatory submissions. To be presented at the UK Life Convention in November. Draft paper available from author.
**Are Impressive Longevity Improvements Softening?** A Change Is Under Way (Matthew Edwards)
Analysis of the basic drivers of longevity variation shows that the outlook for improvements may be easing, particularly in the U.K.

**Evolution or revolution?** Costas Yiasoumi looks at the rise of medical underwriting in the pension risk transfer market.

**Schemes warned against betting on slowing longevity improvements, ∆** (Stephanie Baxter in Professional Pensions). A sharp decrease in mortality rates in the first half of the year has highlighted the dangers of assuming that longevity improvements will plateau ... schemes anticipating a slowdown in longevity improvements could be underestimating liabilities by up to 5%.

**Grieving widows: Exploring excess mortality following bereavement** ∆ (Steven Baxter et al) based on the Club Vita data base. There is a pronounced increase in an individual’s chances of dying following the death of a partner. Allowing for the increased mortality experienced by widow(er)s reduces annuity prices by circa 50bp.

**Fruit and vegetable consumption and all-cause, cancer and CVD mortality:** analysis of Health Survey for England data - O Oyebode, et al. Concludes that a robust inverse association exists between fruit and vegetable consumption and mortality, with benefits seen in up to 7+ portions daily.

### 2 International papers, presentations and articles

**Mortality projections for Social Security Programs in Canada:** The Office of the Chief Actuary (Canada):
A thorough analysis of mortality trends in the general population, in Social Security Programs, Pension Plans and others, taking account of causes of death. The projections cover a long period of time (75 years) and the assumptions are determined by placing more emphasis on historical long-term trends than on recent short-term trends. It is expected that Canada will continue to have one of the highest life expectancies of the world along with Japan, France, Switzerland, Italy and Australia.

**Forecasting mortality for small populations by mixing mortality data**: Ahcan, Medved, Olivieri, Pitacco: Insurance: Mathematics and Economics Volume 54, January 2014, Pages 12–27. Addresses the problem of projecting mortality when data are severely affected by random fluctuations, due in particular to a small sample size, or when data are scanty. Will be useful for small populations, such as small countries (possibly previously part of a larger country), a specific geographic area of a (large) country, a life annuity portfolio or a pension fund, or when the investigation is restricted to the oldest ages.

Compares two models for mortality at high ages. Suggests that mortality deceleration at advanced ages is not a universal phenomenon, and survival of mammalian species follows the Gompertz law up to very old ages.

7 million premature deaths annually linked to air pollution
WHO reports that in 2012 around 7 million people died - one in eight of total global deaths – as a result of air pollution exposure. This finding more than doubles previous estimates and confirms that air pollution is now the world’s largest single environmental health risk. Reducing air pollution could save millions of lives.

There is a variety of articles from the UK and elsewhere including:

- Keeping Some Skin in the Game: How to Start a Capital Market in Longevity Risk Transfer: Biffis and Blake
- A General Procedure for Constructing Mortality Models: Hunt and Blake
- On the modelling and forecasting of socio-economic mortality differentials: an application to deprivation and mortality in England: Villegas and Haberman
- Detecting Common Longevity Trends by a Multiple Population Approach: D’Amato et al
- Sharing Longevity Risk: Why Governments Should Issue Longevity Bonds: Blake et al

International Congress of Actuaries: March/April 2014: Many of the plenary and parallel session presentations at ICA 2014 were recorded with the actual presentation and the accompanying speaker audio: https://cas.confax.com/cas/ica14/webprogram/start.html.
There are facilities for members of any Section of the International Actuarial Association to search for particular sessions.

3 Upcoming events

International Mortality and Longevity Conference 15 – 17 September 2014
This conference, in Birmingham, England, will provide a multi-disciplinary forum for the exchange of information on the latest research, and an opportunity to exchange knowledge, all with the aim of better understanding and managing this complex yet critical subject. Onsite accommodation for this event is now fully booked, however you can still attend the symposium at a reduced rate and book your own accommodation.

Longevity 10 Conference in Santiago Chile 3 - 4 September 2014
Leading international industry and academic representatives, as well as policy makers, will meet and discuss not only the assessment of longevity risk, but also the market and government
developments and responses needed by pension funds and insurance companies to manage this risk.

**IAA Mortality Working Group** in London 12 – 13 September 2014
Agenda and a few of the papers for the meeting.

This is a note **for** the UK Actuarial profession and others, and **for** the International Actuarial Association (IAA). The last six-monthly report is [here](#).

The most recent UK version of the report **from** the IAAMWG is [here](#).

The web page for the Faculty and Institute of Actuaries Mortality Research Steering Committee is [here](#).

The web page for the IAA Mortality Working Group is [here](#).

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