England & Wales mortality monitor – April 2020

Summary

Mortality in the first 13 weeks of 2020, to 27 March 2020, was similar to mortality in the corresponding period of 2019, and well below the 2010-2019 average. However, this could change significantly in the coming weeks, due to the coronavirus pandemic.

Background

This is the latest in a series of quarterly updates monitoring mortality in England & Wales. It is based on provisional weekly deaths data to 27 March 2020 (i.e. week 13 of 2020), published by the Office for National Statistics (ONS) on 7 April 2020. We intend to publish the next quarterly update, for data to the end of week 26 of 2020, in July 2020, but we are also publishing abbreviated weekly updates during the coronavirus pandemic.

All updates are publicly available from the CMI pages of the Institute and Faculty of Actuaries website: https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation/other-cmi-outputs/mortality-monitor.

Coronavirus disease, COVID-19

We are publishing this update during a coronavirus pandemic. The ONS data shows 647 deaths in England & Wales in the period to 27 March 2020 where COVID-19 was mentioned on the death certificate. The coronavirus has had only a small impact on the results shown in this report, as 647 deaths are less than 0.5% of total deaths in 2020 so far, and just over 0.1% of the total annual deaths that we have seen in recent years.

However, data from Public Health England (PHE) shows 5,867 deaths of those hospitalised in England & Wales who tested positive for coronavirus by 5pm on 6 April 2020. We expect that this will have a material impact on results after week 13.

It is possible that we will see a number of deaths in England & Wales in 2020 that is outside the typical range of annual volatility. Stephen Powis, medical director of NHS England, indicated on 28 March 2020 that restricting the number of deaths due to COVID-19 in the UK to 20,000 would be a “good result”. To put this in context, we typically see about 600,000 deaths in the UK each year, from all causes. As we indicated in CMI Working Paper 129, if the number of deaths is outside the typical range of annual volatility, we will consider whether to modify the data or Model so that CMI_2020 meets Subscribers’ needs.

We have used our standard approach in producing this report, basing it on data published by the Office for National Statistics. Our calculations rely on data for registered deaths, and we are conscious that in recent weeks deaths may have been registered later than in previous years, due to restrictions on movement and increased pressure on the medical profession. Consequently, comparisons of mortality between 2020 and earlier years may not be entirely on a like-for-like basis.

Notes

All of our analysis in this update is based on Standardised Mortality Rates (SMRs). These adjust the provisional weekly deaths data published by the Office for National Statistics to allow for changes in the population over time.

Charts A, B and C show centred averages of weekly SMRs. The annual averages smooth out seasonal variations. The quarterly averages smooth short-term variations but still show seasonal patterns, allowing the identification of, for example, winters with particularly heavy or light mortality.

Chart D shows cumulative standardised mortality (cSMR) for each year, relative to the average for 2010-2019, and Chart E shows cumulative standardised mortality improvements (cSMRI) for each year (i.e. the progression of annual mortality improvements over the course of each year). Charts D2 and E2 show the same information as charts D and E respectively in a different format and may be easier to interpret for those with colour vision deficiency.

Charts A to E show results for males and females combined, for ages 20-100. Charts F and G show variations in the cSMR and cSMRI by gender and age band.

The numerical results underlying the charts are provided in an accompanying spreadsheet, together with further results, including SMRs by gender and age band.

Full details of the methods used are included in Working Paper 111.

Use of this document

Please note that:

- The CMI disclaims any liability from use of or reliance on these calculations, including in relation to financial transactions such as longevity swaps; and
- The CMI does not guarantee that it will continue to publish quarterly updates.

Please also see the reliances and limitations, disclaimer, and copyright notice on the final page of this document.

This document is categorised as a "Research Report" as defined in the Terms and Conditions.

TAS compliance

This paper is intended to analyse recent mortality in England & Wales. It complies with the principles in the Financial Reporting Council's Technical Actuarial Standard "TAS 100: Principles for Technical Actuarial Work". Any person using this paper should exercise judgement over its suitability and relevance for their purpose.

Smoothed mortality at a point in time

Chart A shows quarterly (13-week) and annual (53-week) centred averages of SMR, since weekly deaths data became available. Note that although we have used data from 31 July 1999 to 27 March 2020, the quarterly and annual averages start 6 and 26 weeks later and stop 6 and 26 weeks earlier.

The annual average SMR shows a fairly steady fall from 1.75% in early 2000 to 1.30% by mid-2011. From mid-2011 to mid-2018, the annual average SMR was fairly flat, remaining within the range from 1.24% to 1.34%, but it reached a new low of 1.20% in 2019. It has since risen slightly, and the latest value is 1.22%.

The quarterly average SMR shows that mortality peaks each winter. Winter mortality in 2019/20 was lower than average, and broadly similar to 2018/19.

Chart A: Quarterly and annual centred average SMRs – whole period

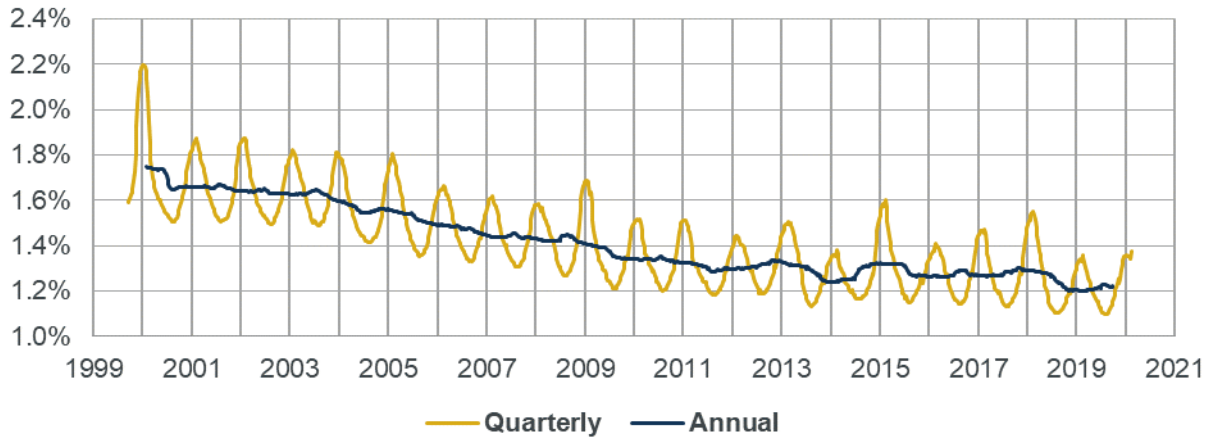


Chart B shows the same information as Chart A, magnified to show the current year and the previous five years more clearly.

Chart B: Quarterly and annual centred average SMRs – current and previous five years

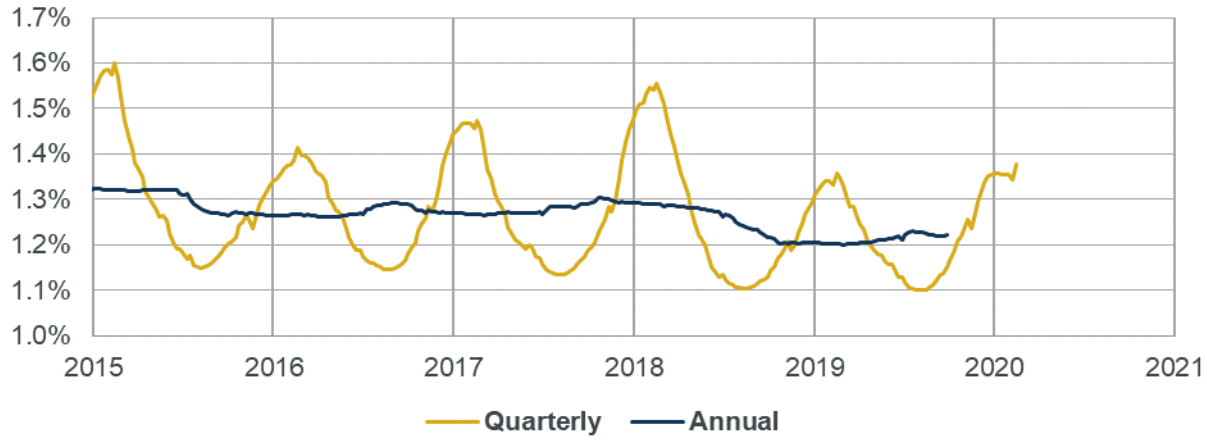
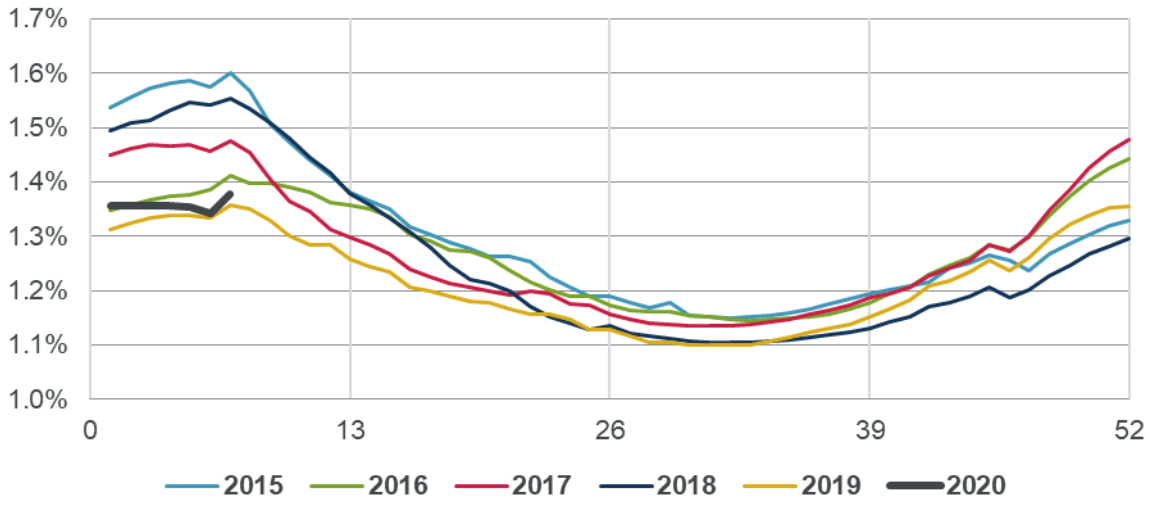


Chart C shows the quarterly average SMRs from Chart B for each year, with values plotted by week number to aid comparison. We note that although lines are labelled by calendar year, the quarterly averages for weeks towards the start and end of each year will be affected by mortality in earlier and later years respectively. The chart again illustrates the relatively low level of mortality in the early part of 2020.

Although the quarterly average shows an uptick in week 13 of 2020, this is not all due to the coronavirus. It is partly explained by week 52 of 2019, which had a low number of registered deaths because of public holidays, dropping out of the 13-week average at this point.

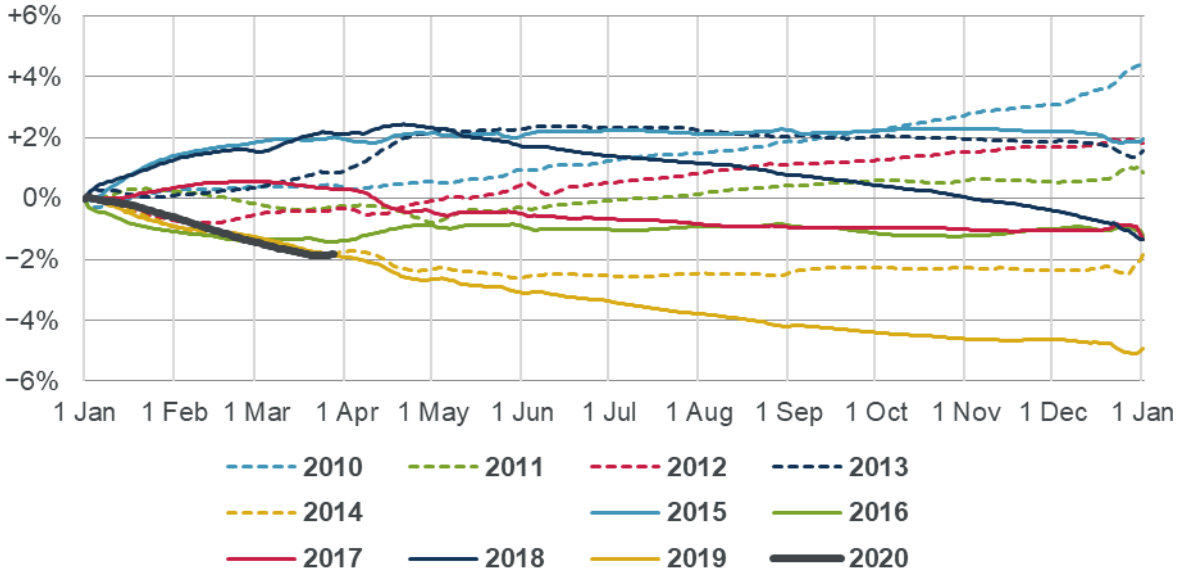
Chart C: Quarterly centred average SMRs, by week number



Cumulative mortality

Chart D shows cumulative standardised mortality rates for the first quarter of 2020 and for the previous ten years compared to the 2010-2019 average. (The calculation method is described in Section 4.2 of Working Paper 111.) Chart D2 shows the same information in a different format and may be easier for those with colour vision deficiency.

Chart D: Cumulative standardised mortality rate (cSMR) compared to the 2010-2019 average



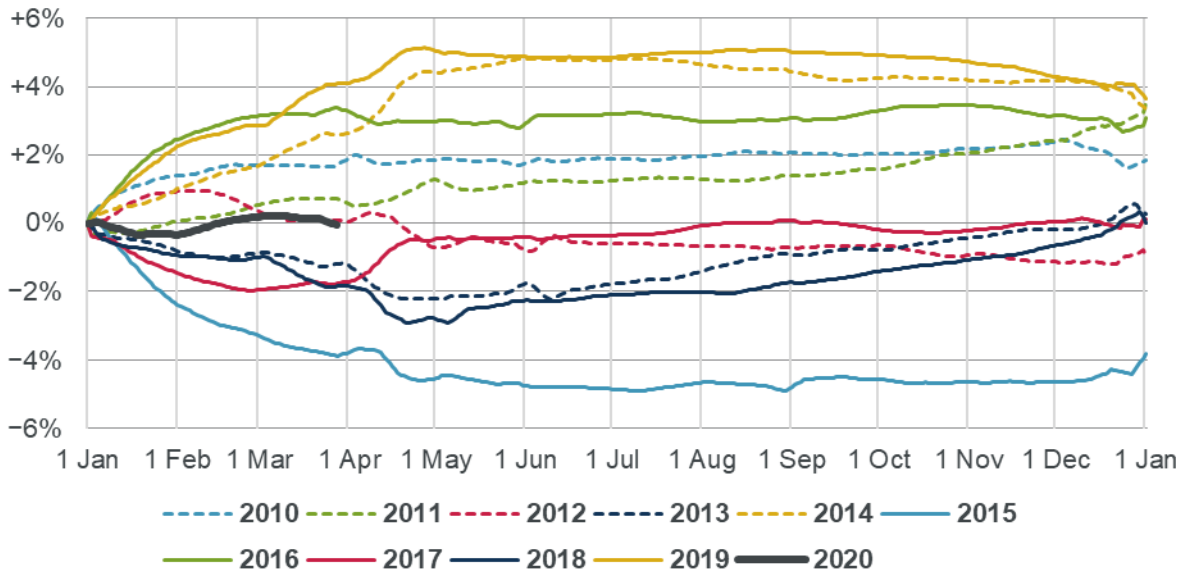
All years have a value of 0% at the start of the year, by definition, as there has been no mortality at that point of the year. If mortality improvements had been constant throughout the period considered then the lines for each year would form a "fan", with the end-year values decreasing steadily from year to year. While we saw a decrease of this sort in the years up to 2011, there is no clear pattern to the end-year values for later years, as mortality has been volatile with low improvements. Mortality for complete calendar years was lowest in 2019.

Chart D shows that cumulative standardised mortality in 2020 is well below the ten-year average, and is similar to mortality in 2019.

Chart E shows the cumulative annual standardised mortality improvement (also described in Section 4.2 of Working Paper 111) for 2020 and for the previous ten years. Chart E2 shows the same information in a different format and may be easier for those with colour vision deficiency.

Note that Chart E shows cumulative improvements, so a higher value represents a higher improvement and lower mortality; whereas in Chart D a higher value represents higher mortality.

Chart E: Cumulative annual standardised mortality improvement (cSMRI)



Mortality in early 2020 has been similar to the corresponding period in 2019. The cumulative mortality improvement for the first quarter of 2020 is −0.1%.

Note that:

- The cumulative values at the end of the year in Charts D and E may not necessarily agree precisely with the corresponding values based on annual data. This is because some weeks span two years, requiring us to estimate in which year those deaths were registered.
- Mortality improvements vary by age (as shown later in this report) and the mortality improvements shown in Chart E are sensitive to the age distribution of the chosen standard population.

Chart D2: Cumulative standardised mortality rate (cSMR) compared to the 2010-2019 average, showing 2010-2020 and highlighting individual years

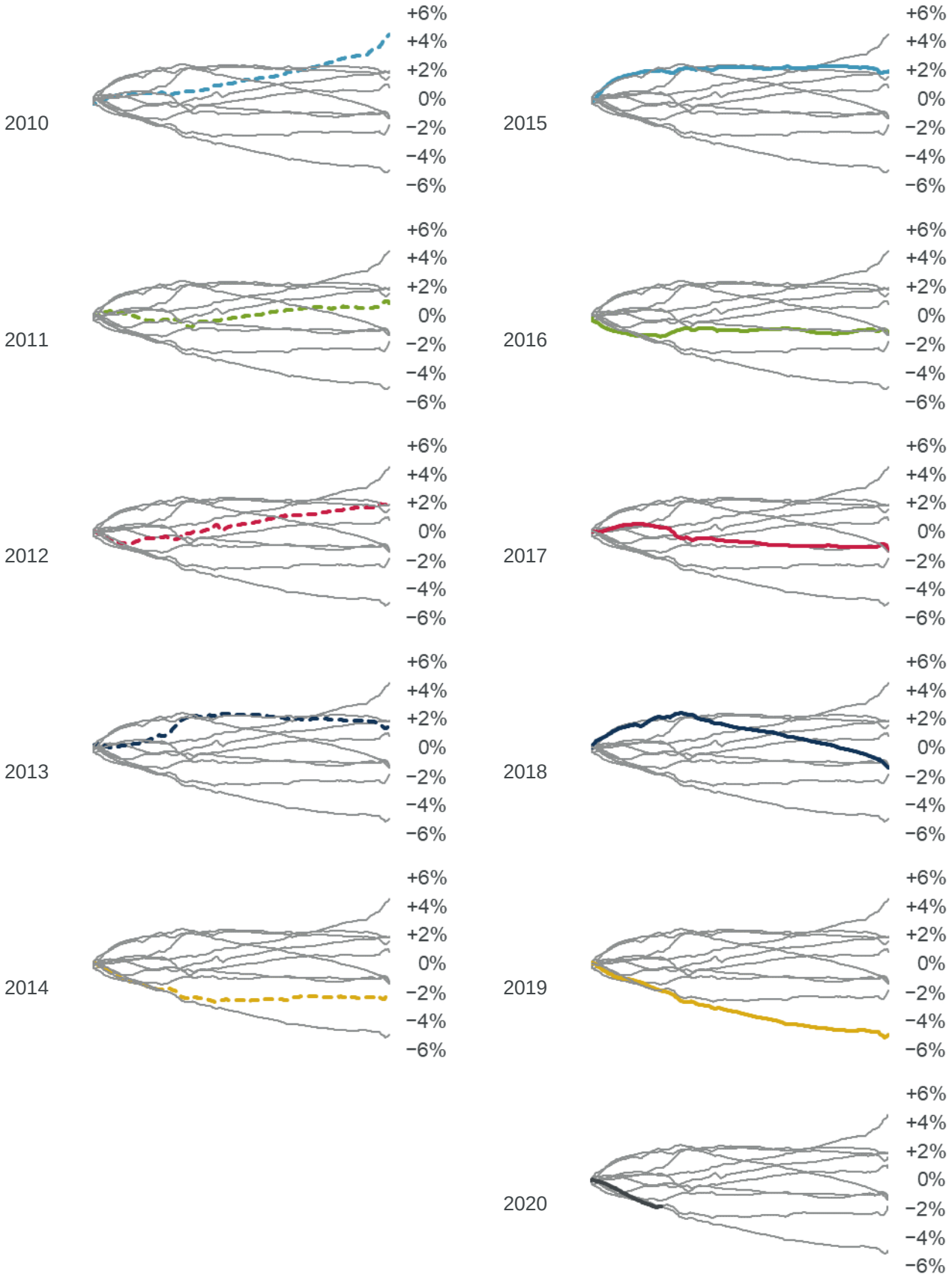
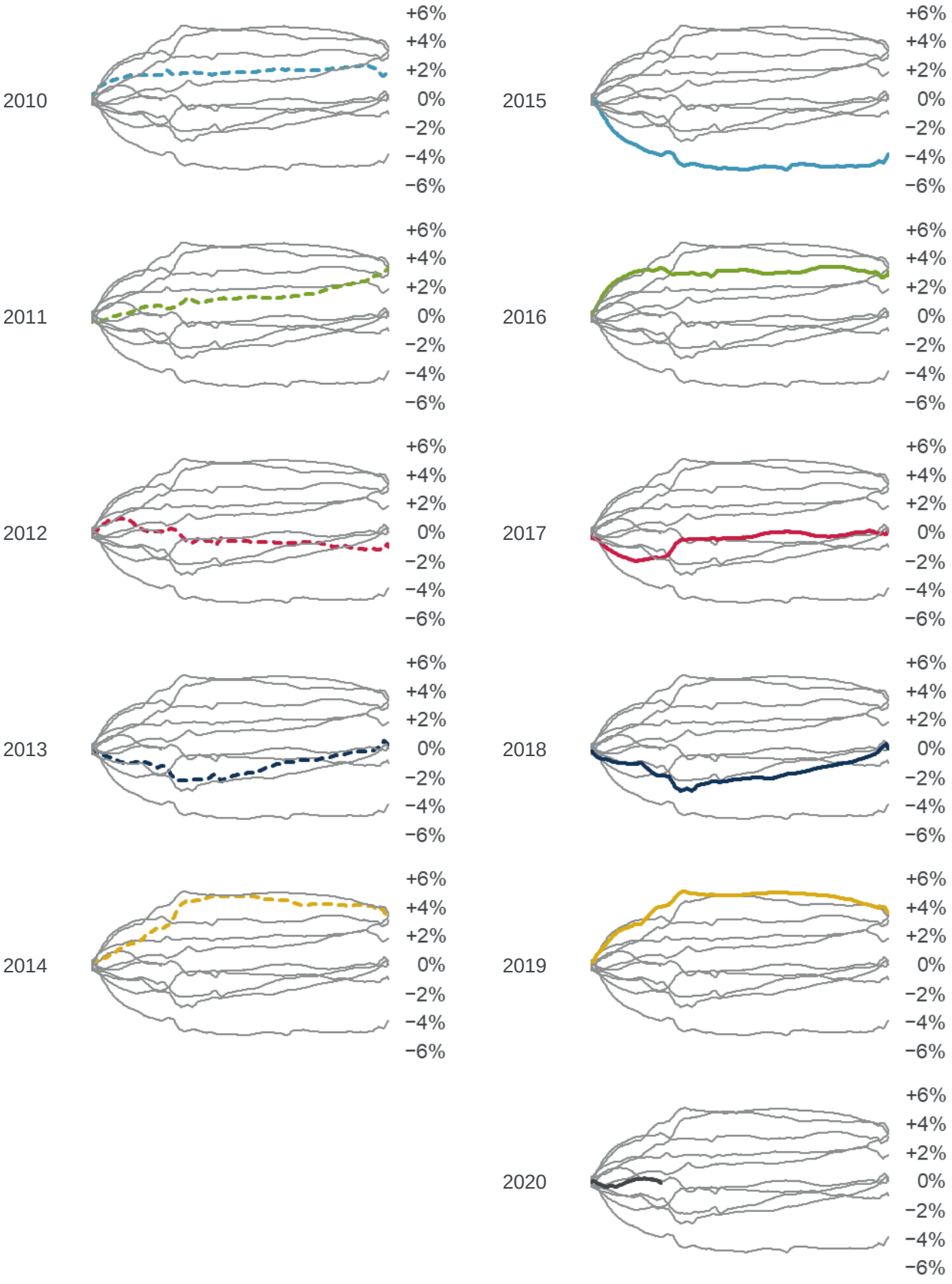


Chart E2: Cumulative annual standardised mortality improvement (cSMRI) for 2010-2020, highlighting individual years



Implication for CMI_2020

As noted on page 1, we have used our standard approach in producing this report, so that it is consistent with previous quarterly updates. The analysis in this section shows possible outcomes from CMI_2020 assuming no change in method. However, if the number of deaths in 2020 is outside the range of normal annual volatility, then we would consider whether to modify the data or Model so that CMI_2020 meets Subscribers' needs.

Table 1 is based on Section 7 of Working Paper 129 and shows how life expectancy might change between CMI_2019 and hypothetical versions of CMI_2020, based on a range of possible mortality improvements and assuming no change in method.

Based on the table, should the cumulative annual standardised mortality improvement remain at the current level of −0.1%, we might expect little change in life expectancy, similar to the "nil improvement" row (in the absence of any change in method). However, as illustrated in Chart E, users should be mindful that the cumulative annual standardised mortality improvement can vary significantly. This is particularly true during the coronavirus pandemic.

Table 1: Percentage difference in life expectancy between CMI_2019 Core and CMI_2020 Core for different levels of mortality improvement in 2020, assuming no change in method

Gender and age	Male 45	Female 45	Male 65	Female 65	Male 85	Female 85
+6% improvement	+1.4%	+1.3%	+2.1%	+1.9%	+2.5%	+2.6%
+3% improvement	+0.6%	+0.6%	+0.9%	+0.9%	+1.1%	+1.3%
Nil improvement	−0.2%	+0.0%	−0.3%	−0.1%	−0.4%	−0.1%
−3% improvement	−1.0%	−0.7%	−1.5%	−1.1%	−1.8%	−1.4%

Variation by gender and age

Charts F and G shows how cSMR and cSMRI have varied by gender and age band.

Chart F shows considerable variation by age band:

- The spread of mortality rates over the period is widest for ages 65-84 and narrowest for ages 85+, for both genders.
- Mortality in the first quarter of 2020 has been below the 2010-2019 average for males and females for all age groups shown.

Chart G shows that:

- Mortality improvements in the 2010-2019 period have been most volatile for the 85+ age band, particularly for females.
- Mortality improvements in the first quarter of 2020 are fairly close to zero for males and females for all age groups shown.

Chart F: Cumulative standardised mortality rate (cSMR) compared to the 2010-2019 average, by gender and age-band

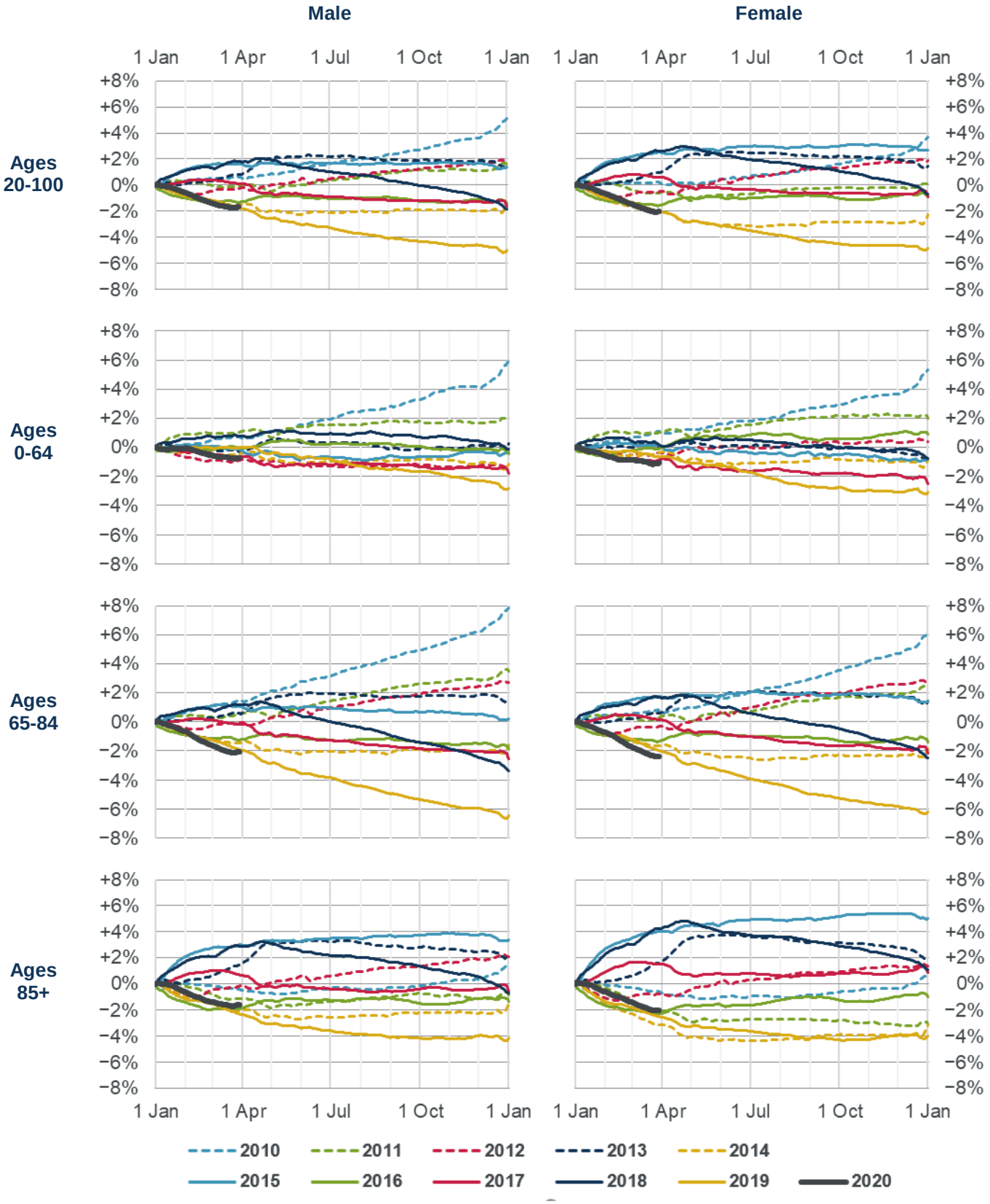
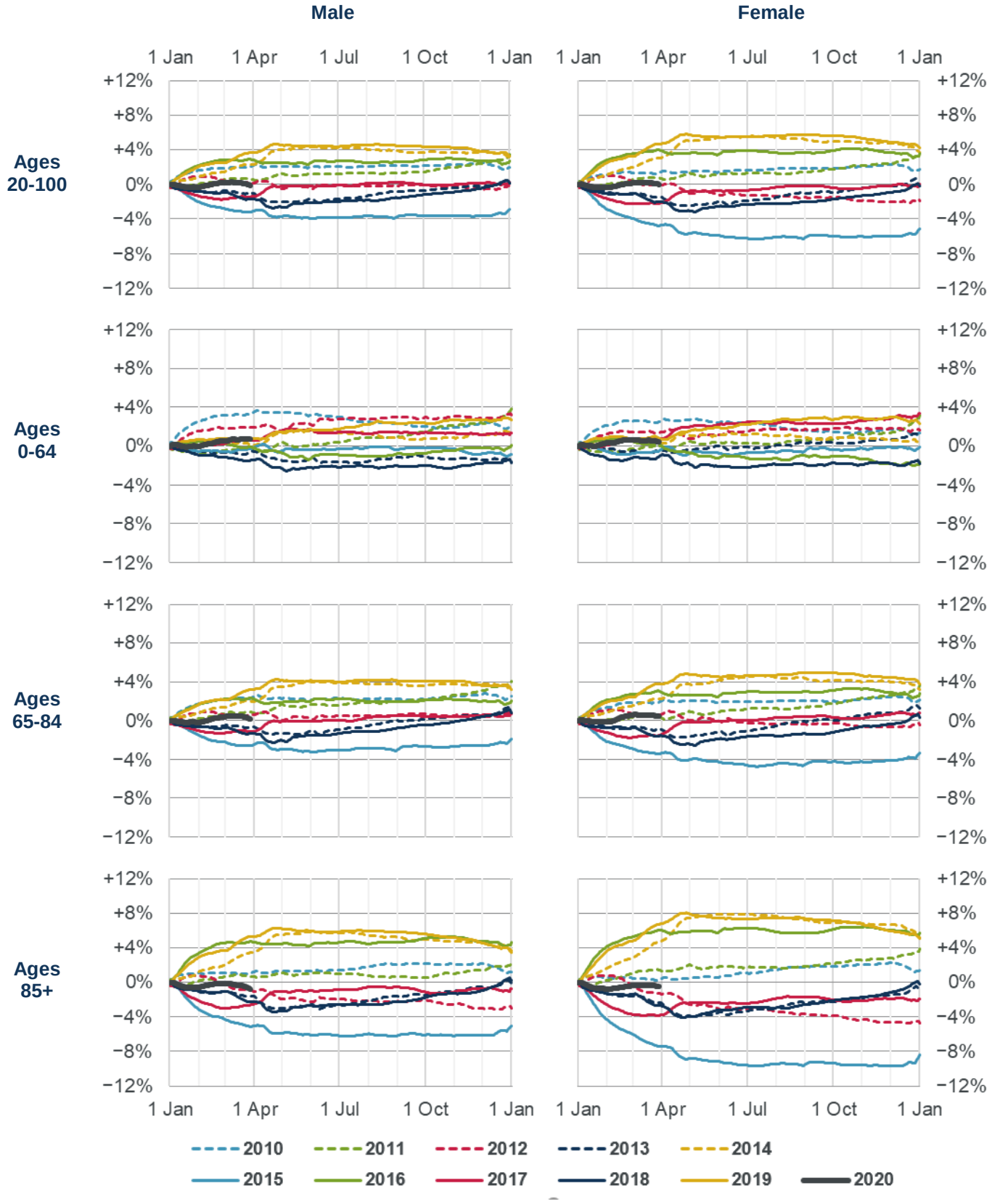


Chart G: Cumulative annual standardised mortality improvement (cSMRI), by gender and age band



Reliances and limitations

The purpose of the mortality monitor is to provide regular updates on standardised mortality in England & Wales, adjusting ONS data to allowing for changes in the size and age of the population. This can be used to inform a view on the outcome of the next version of the CMI Model, in the absence of any change in method.

The CMI aims to produce high-quality outputs and takes considerable care to ensure that the mortality monitor and the accompanying spreadsheet of results are accurate. However:

- We cannot guarantee their accuracy (see the Disclaimer).
- There is a reliance on the underlying data, published by the ONS and described as provisional.
- We have also applied judgement and assumptions in deciding on the calculation methods and the presentation of results.
- Anyone using the results of the mortality monitor should ensure that it is appropriate for their particular use, and note that care is needed when estimating full year experience from partial year experience. This is particularly true during the coronavirus pandemic.

Continuous Mortality Investigation Limited ("CMI") is registered in England & Wales
Company number: 8373631
Registered Office: 7th floor, Holborn Gate, 326-330 High Holborn, London, WC1V 7PP

Correspondence address: Two London Wall Place, 123 London Wall, London, EC2Y 5AU
Email: info@cmilimited.co.uk
Tel: 020 7776 3820

Website: www.cmilimited.co.uk (redirects to www.actuaries.org.uk)

Continuous Mortality Investigation Limited is wholly owned by the Institute and Faculty of Actuaries.