



# Mortality update

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**isio.**

# Summary

Isio has considered the recent release of the CMI 2022 mortality projection model in light of experience since the Covid-19 pandemic and the current economic outlook. We have modelled a range of scenarios for mortality improvement in the coming years. We conclude that the core parameters set out in the CMI 2022 model fail to fully allow for recent experience and the factors that we believe will drive mortality experience in the coming years. This paper sets out a high level view of the modelling we have undertaken and our views on likely future mortality experience in the UK, together with our approach to adjusting the model to reflect our views.

Broadly, Isio considers that greater weight should be placed on adverse mortality experience since 2020 and that in the long term mortality improvements are likely to be slower than previously expected. This means that we expect life expectancies in the future to be lower than was previously expected and that this evolution of mortality estimates should lead to lower best estimates of pension scheme liabilities than in previous years.

A further consideration for Companies and Trustees managing their pension schemes may be the impact of evolving understanding of longevity on the cost to buy out pension scheme liabilities. If Isio's view on mortality improvements becomes more widely accepted, then it is possible that buyout pricing will fall over time, allowing more schemes to transact and offering potential savings for sponsors that delay transacting until pricing moves.

## Key parameters

There are a few terms used in this paper that relate to the key parameters used in the CMI model:

- **Weighting ('w') parameters:** Since 2020, the model has allowed users to vary how much weight is applied to data in individual years. The CMI 2020 Model had a core weighting parameter ('w2020') of 0% - i.e. no allowance for 2020 population mortality data reflecting a view that the extreme mortality rates seen early in the Covid-19 pandemic would not be reflective of future mortality. The CMI 2021 Model continued this view with core weighting parameters ('w2020' and 'w2021') of 0%.
- **Initial Addition ('A') parameter:** This parameter was introduced in the CMI 2018 Model to allow users to reflect their view of differences in improvement rates between the England & Wales population (used in the development of the model) and the population they are interested in (e.g. pension scheme members).
- **Long-term improvement rate parameter:** This parameter has existed since the inception of the CMI model and is particularly subjective given it represents the expected rate of mortality improvement many years into the future. The CMI Model effectively generates a progression of changing mortality improvement rates that target achieving the user defined long-term improvement rate over a defined period of time.

# Introduction

This paper sets out Isio's views on future mortality following the publication of the latest actuarial mortality projection model, CMI 2022. It also includes a high level description of the thinking and factors underpinning this view.

During the Covid-19 pandemic, UK mortality experience was both much worse than had been experienced in preceding years and very volatile from week to week as successive waves of infection peaked and subsided. However, during 2022 this volatility fell away and the pattern of death rates became more consistent with previous years, eventually settling at a higher rate than experienced in 2019 (the most recent 'normal' year) for the last 8 months of 2022. Ultimately, the standardised mortality rate in 2022 was 6% higher than in 2019.

In 2023, so far, this pattern of low volatility, higher than 'normal' (2019) death rates has continued. At the time of writing our estimate is for a standardised mortality rate around 9% higher than 2019. The sustained high mortality since 2019 has been a particularly unusual period – we have to go back to World War II to find a period as unusual as 2020-2022 relative to the preceding five-year average.

Because of these facts, the Continuous Mortality Investigation ('CMI') – the body that develops the modelling tools that are used by pensions actuaries in setting assumptions – concluded that mortality in 2022 "*may be indicative of future mortality to some extent*". The 2022 version of the CMI model therefore contained, for the first time since the start of the Covid-19 pandemic, some weighting (25% of 2022) to post-2019 mortality data in the core version of the model.

In last year's update we shared our view that it was unjustifiable to not give any weight to recent data, in effect assuming mortality improvements took place in 2020 and 2021 despite real world events. We undertook scenario modelling to understand potential impacts and we recommended corresponding adjustments to the core CMI model to allow for our conclusions. Our view, that some allowance should be made for post-2019 mortality experience remains unchanged, and actually reinforced by the emerging evidence discussed above, and overleaf we discuss updated scenarios we've used to develop our approach to setting mortality assumptions in 2023.

Whilst there are two main building blocks to the mortality assumptions that actuaries use, we have focused in this paper on the projections assumption, set using the CMI model to predict the future path of mortality improvements. We expect new base mortality assumptions to be released in early 2024 and will provide a further update at that time.

It should be noted that the views set out in this paper do not consider the potentially adverse impacts of climate change resulting from a failed green transition on life expectancies.

# Scenario modelling

At this stage we, perhaps obviously, do not know how long the current higher mortality experience will continue or whether they are the “new normal”. However, we can be clear that current experience is materially higher mortality than 2019 and that there is a wider set of factors that we expect to impact mortality in the medium-to-longer term:

- **Ongoing negative impact on health from the Covid-19 pandemic** – The UK is still experiencing deaths from Covid-19, but deaths from other causes are now higher and are increasing. This may be the effect of delayed identification and treatment for other conditions due to repeated lockdowns, amongst other factors.
- **Healthcare within the NHS** – As you will have seen in the news, waiting times for urgent treatment have increased over 2022 and continue to increase in 2023. Increased waiting times are highly correlated with excess deaths. Further, the necessary significant increase in functional capacity to relieve demand pressure on the NHS is unlikely to be achieved in the near term, due to wider economic constraints affecting the UK economy.
- **Unknown nature of the effect on people with long-covid** – This is a current area of research as the effect of long-covid (or of multiple Covid infections) on an individual’s longevity is not yet known. However, we believe this will be a contributing factor to future poor health in those individuals. For example, there is emerging evidence in the development of cardiovascular diseases and other long term conditions that could be expected to shorten life expectancy for affected individuals.

Based on these factors and the continuing worse mortality experience in comparison to 2019, we have modelled three new scenarios for the development of mortality rates in the coming years. These are designed to reflect the shock to mortality experience that has occurred and differ in the length of time this shock will persist before mortality rates start to improve again.

Our view is that there is a relationship between improvements in life expectancy and economic growth/productivity rises. There are various studies citing this relationship, e.g. Samuel Preston, World Bank and the International Longevity Centre. Our view is that longevity improvements in the UK will be linked to the time period during which meaningful economic and productivity growth restarts

At the time of writing, it is hard to see a return to strong levels of economic growth in the near term, as the country battles with the fall out from the pandemic, Ukraine war, currency devaluation and the exit from the EU causing trading challenges, government debt rising above 100% of GDP for the first time since 1961, plus ongoing global and local political uncertainty.

The scenarios we have modelled are focused on an assumption of an initial 5% heavier mortality shock (vs. 2019 mortality rates), with no mortality improvements for 5, 10 and 15 years, before returning to the path of improvements seen in the CMI 2022 Model. These are described below:

## Scenario one – a 5 year pause in mortality improvements:

- Initial 5% heavier mortality shock vs. 2019 mortality rates
- For 5 years from 2022 mortality rates remain at the same level and do not show any improvement.
- The first improvement in mortality rate is seen in 2028 where CMI 2022 model improvements are then observed.

## Scenario two - a 10 year pause in mortality improvements:

- Initial 5% heavier mortality shock vs. 2019 mortality rates
- For 10 years from 2022 mortality rates remain at the same level and do not show any improvement.
- The first improvement in mortality rate is seen in 2033 where CMI 2022 model improvements are then observed.

## Scenario three - a 15 year pause in mortality improvements:

- Initial 5% heavier mortality shock vs. 2019 mortality rates
- For 15 years from 2022 mortality rates remain at the same level and do not show any improvement.
- The first improvement in mortality rate is seen in 2038 where CMI 2022 model improvements are then observed.

The following table sets out the liability impact and the additional weightings, above the core parameters set out by the CMI, that broadly match the liability impact of the modelled scenarios against the CMI 2022 Core Model, i.e. a w2020 and w2021 parameter of zero and a w2022 parameter of 25%.

Scenario	Typical liability impact relative to the CMI 2022 Core Model (joint life basis)	Additional weightings above core parameters
One	0.5% -1%	10%
Two	1% - 1.5%	15%
Three	1.5% - 2%	20%

All the scenarios we model lead to a reduction in life expectancy and, consequently, pension scheme liabilities, compared to the use of the CMI core model. This is consistent with and further develops our view last year and reflects the worsening outlook for mortality in the UK, revealed by the evidence of 2022 and 2023 to date. However, we recognise that we aren't in the business of making long-term economic forecasts, which therefore leads us to favour Scenario One as our best estimate position for mortality trends at present.

For completeness, we also note that Scenario One contains mortality rates 5% worse than 2019 and that, in reality, 2022 experienced mortality rates 6% worse than 2019 and 2023 is on course for worse experience still. Therefore, we believe our approach is likely to reflect a 'cautious best estimate' given the current evidence.


## Other parameters

Long-term improvement rate parameter:

- Given the worsening UK outlook on mortality – it makes sense to reconsider the "target" rate of improvement the CMI Model calibrates to in the longer term.
- Current market practice gravitates to a long-term assumption of 1.5% p.a. for funding purposes and 1.25% p.a. for best-estimate purposes (e.g. accounting).
- Improvement rates have historically been less than 1% p.a. except for the last c.40 years where much stronger rates of improvement have been seen.
- However the last c.10 years have seen a sharp downturn with 5-year average improvement rates at or below 1% across the population.
- Further, we question whether there will be sufficient economic resources available to drive further rapid improvements to life expectancy through a disorderly climate transition, our central view.
- Our view, therefore, is that it is appropriate to adjust the long-term rate assumption down to 1% p.a. for best estimate purposes at this current time.
- We recognise that 1.5% p.a. is likely to remain commonly used for funding purposes, where Trustees are required to set a prudent assumption.

Initial Addition ('A') parameter:

- CMI improvement models are calibrated to the general population within England and Wales, which may or may not reflect a specific pension scheme's population.
- The A parameter was introduced as a way of easily reflecting views on appropriate improvements for specific populations.
- The latest data on differences in mortality improvements between the general population and pension scheme populations cover the period 2011-2020 but are heavily distorted by the significant mortality seen in 2020 which is likely not materially indicative of future trends
- Looking at the period 2010-2019 there is no significant difference between improvements in the general population and the pension scheme population
- Our view, therefore, is that for best estimate valuations involving a "typical" pension scheme, an A parameter of 0% should be used but up to 0.25% may be relevant for additional prudence in funding valuations.



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