Mortality update

July 2025

isio.
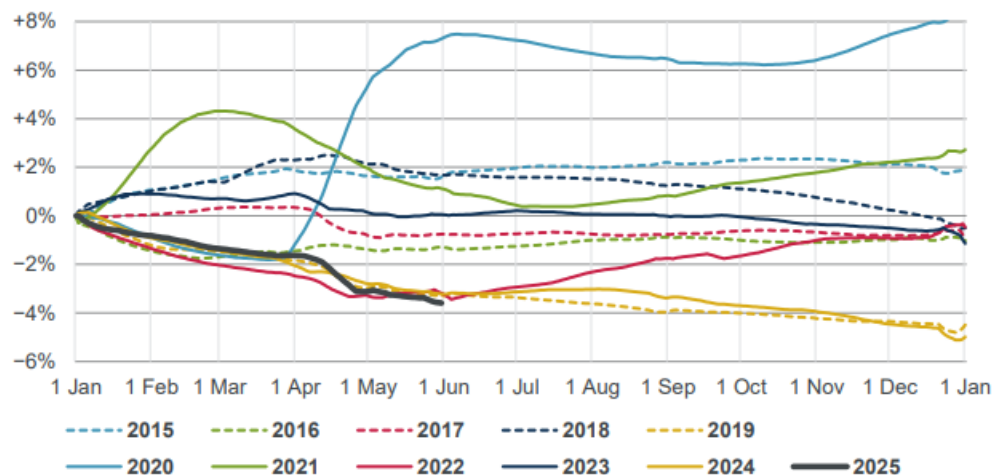
Introduction

This paper sets out Isio's thoughts on future mortality following the publication of the latest actuarial mortality projection model, CMI 2024. The Continuous Mortality Investigation ('CMI') is the body that develops modelling tools that are used by pensions actuaries in setting assumptions. Whilst there are two main building blocks to the mortality assumptions that actuaries use, this paper focuses on the projection assumption, set using the CMI model to predict the future path of mortality improvements. The CMI has made changes to the CMI 2024 model. We find the modelling changes positive but take a different view to the CMI's Core Model on the best-estimate half-life parameter to use. We discuss this in more detail later in this paper.

When setting their 'base' mortality tables, interested parties should note the release last year of the latest 'SAPS 4' tables which users should consider updating to use. It should be understood that the views set out in this paper do not consider the potential direct impacts of climate change on life expectancies.


Source: CMI, based on ONS data

2024 mortality experience in England & Wales was around 4% lower overall than in 2023, and slightly below the previous record low year of 2019. However, improvements in mortality experience were not even across all age groups, with older age groups seeing greater improvements than younger age groups. At the time of writing, 2025 mortality experience is also shaping up to be very similar to 2024 experience.

This is translated into the age standardised mortality rates (ASMRs) published by the CMI on the graphs below, which shows a summary for both males and females. The lower the ASMR, the better the mortality experience was in that year (i.e. fewer deaths).
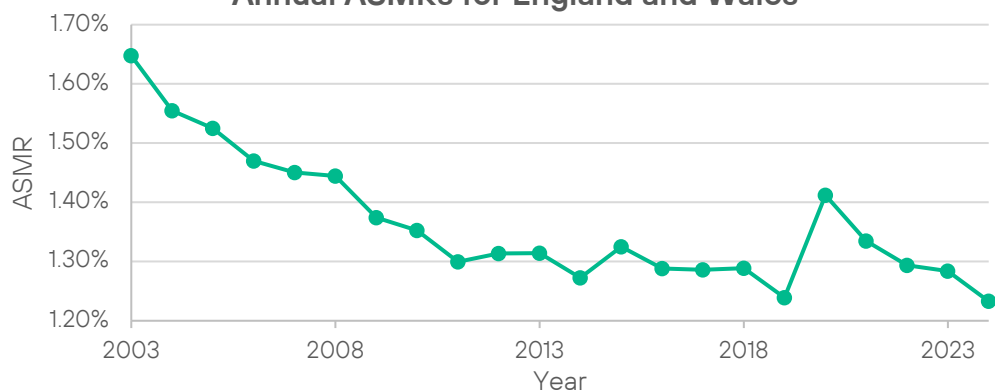
Source: Isio analysis of CMI data

Given this news, and our view that utilising all of the most recent experience is appropriate in setting long-term mortality trends, we have adjusted our life expectancies upwards compared to last year. We still exercise some caution over the recent positive news given stagnating economic growth and other global factors. Added to this, the NHS is still under pressure from increased waiting times and chronic health conditions such as long-covid are still prevalent. Therefore, our views on best estimate life expectancies still do not match the CMI's Core Model. We explain this in further detail in this paper.

You may have also seen increased attention in the press linking the effect of weight loss drugs (brand names include Mounjaro and Ozempic amongst others) to potential increased longevity. Whilst we recognise the positive effect that these drugs could have on the health of the UK population, there are still potential unknowns in relation to the side effects of and access to these drugs, and whether they will truly impact mortality rather than just morbidity. Therefore, we believe it is too early to take a view on whether their use will materially affect the longevity of the UK population in future.

As the model has just been released it is too soon to know how insurers will reflect the latest model within their pricing basis – although we note that insurers have had a more cautious view in recent years and tend to use different approaches to recognising experience as it comes through rather than waiting for the release of the CMI model. We might therefore expect that current trends are already "priced in" to insurer quotes and the economic equation for buyers of insurance, when considering whether to insure or run-on, will remain unaffected by this latest release.

Key Parameters

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

- **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.

- **Initial Addition ('A') parameter**: The Initial Addition 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).

- **Weighting ('w') parameter:** This parameter has been superseded by the half-life parameter. In previous years, the model has allowed users to vary how much weight is applied to data in individual years. The CMI 2023 model had no allowance for the population mortality data in years 2020 and 2021. For the population data in years 2022 and 2023 the CMI introduced a partial weighting of 15% as part of their Core Model, to reflect that the data in these years was becoming more reflective of the future.

- **Half-life ('H') parameter**: The half-life parameter is a new addition for CMI 2024 in place of the weighting parameter. This parameter controls how quickly the effect of the short-term pandemic experience shock, or 'overlay', is removed to allow actual mortality experience to set the improvement trend in the model. More information on this parameter is available later in this paper.

Changes to the CMI 2024 model

There have been some changes to the CMI 2024 Core Model compared to the CMI 2023 Core Model:

- The CMI 2024 Core Model has been extended to ensure the model can better reflect the changing trends at different age groups observed in the data. Notably, there have been fewer than expected deaths at older ages and more deaths at younger ages. In our view the CMI have made positive changes to the model.

- A new half-life parameter which controls an overlay to the model has been introduced to replace the previous 'weights' parameter. Our best estimate approach is to set this new half-life parameter to 0.5 years. This differs from the CMI's Core Model which uses a half-life parameter of 1 year. We cover in more detail below.

The CMI's previous approach to reflecting pandemic experience

Previously the CMI used a 'weights' approach to the model to allow users to vary how much weight is applied to data in individual years. This was designed to allow the impact of short-term high mortality rates during the COVID-19 pandemic to be excluded from longer term projections of mortality improvements. However, in 2022 this volatility fell away, and the pattern of death rates became more consistent with previous years. From 2022 the CMI included some weighting to post-2019 mortality data in the core version of the model.

Here is a summary of the weightings used in previous years with a comparison between the CMI's Core Models and our views. As you can see, we have consistently applied higher weightings to the mortality experience between 2020 and 2023 to utilise the maximum amount of credible data available.

Weighting	w2020	w2021	w2022	w2023
Core CMI model				
CMI 2020 model	0%	-	-	-
CMI 2021 model	0%	0%	-	-
CMI 2022 model	0%	0%	25%	-
CMI 2023 model	0%	0%	15%	15%
Isio best estimate				
CMI 2020 model	10%	-	-	-
CMI 2021 model	10%	10%	-	-
CMI 2022 model	10%	10%	35%	-
CMI 2023 model	0%	0%	100%	100%

## The new approach to reflecting post pandemic experience

There are two components to mortality projections in the CMI 2024 model, the underlying mortality trend, plus a short-term pandemic experience shock, or 'overlay'.

Instead of using individual weights for each year between 2020 and 2023 to try and represent the underlying mortality from the pandemic experience, the overlay uses the full weight of all the data points of these years. The overlay is removed gradually over time to eventually leave the underlying long-term mortality trend remaining. Users can change the timing of the removal of the overlay depending on their views of the pandemic mortality experience. This is controlled by the 'half-life parameter' ('H').

The overlay approach allows a better fit to the actual mortality experience seen during the pandemic whilst still retaining appropriate projected mortality rates in the future. The use of weights in CMI_2023 model couldn't give both of these

features and so the focus was on the projected mortality rates at the expense of fitting to actual data during the pandemic.

How does the half life parameter affect the overlay?

Male, ages 20-100
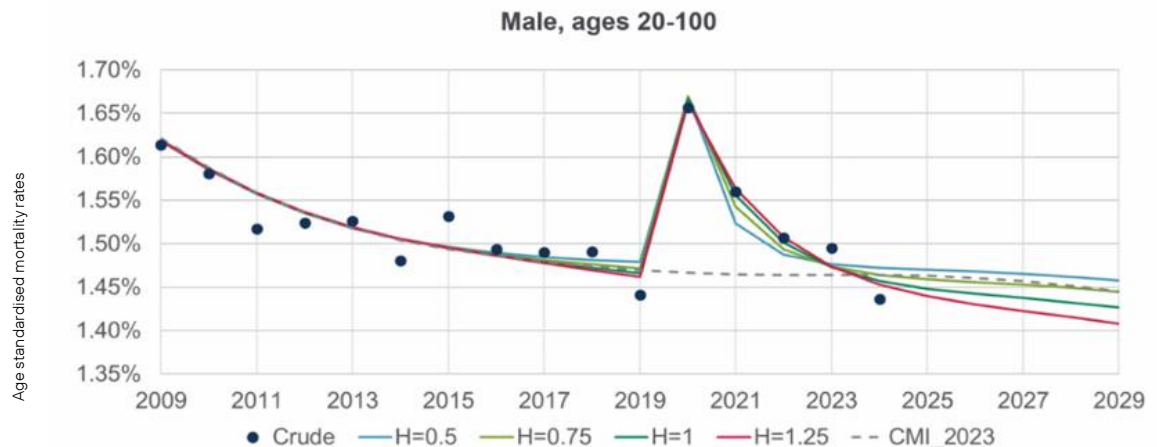
Source: CMI

The half-life parameter represents the speed of decay of the overlay (the time taken for the overlay to halve in size) and is measured in years. For example, H=1 years means a halving period of 1 year – therefore the short-term pandemic shock (overlay) in 2020 will be half as big in 2021, half as big again in 2022, half as big again in 2023, and so on.

This chart above from the CMI during the consultation period shows how the overlay changes depending on the value of the half-life parameter (example shows males aged 20-100 only as an illustration). H=0.75 years is close to the underlying CMI 2023 Core Model. However, H=1 years was chosen as the Core parameter by the CMI committee due to it producing, in their view, a reasonable result for CMI 2024. Potentially this reflects a view that the mortality improvement in 2024 was a signal for increasing optimism. This decision wasn't unanimous within the committee, reflecting that the choice of half-life parameter does depend on your view of how indicative recent experience is of future experience.

The shorter the half-life, the quicker we recognise all of the underlying data as credible. Due to the way the mortality rates have fallen in the last few years, the shorter the half-life, the higher the projected long-term mortality and the lower the life expectancies.

How did we reach H=0.5 years as our best estimate approach?

One of the options the CMI put forward this year in their consultation was a 'simpler weights' method. The weights would have been as follows:

Year	2020	2021	2022	2023	2024
Weights	0%	0%	100%	100%	100%

This would effectively be a continuation of our best estimate position for the CMI 2023 model last year when the 'weights' parameter was set to 100%, so this is a natural starting position when looking at which half-life parameter would be appropriate to use as our best estimate. As can be seen in the comparison table on the next page (row B), this continuation would give a small increase in life expectancy alone compared to our current best estimate.

We also wanted to reflect that, whilst our views on the challenges faced in the UK and potential impact on mortality haven't changed, 2024 mortality experience has been lighter and 2025 experience is also looking fairly consistent with 2024 to date (at the time of writing) and so a further increase in life expectancy, under our best estimate view, could be justified.

We retain our previous position on fully using the most recently available data. We believe that most of the effect of the pandemic on UK mortality is now behind us, and we see any experience now as being reflective of an underlying longer-term trend. This implies a shorter half-life (i.e. higher decay) and H=0.5

years delivers a fully decayed position in 2024. The Core Model with H=1 years still has some impact of the overlay in 2024 and therefore implies that short-term pandemic impacts are still occurring.

Using H=0.5 years gives a further increase in life expectancy when compared to the 'simpler weights' approach as seen in the comparison table below (see row C vs. row B). It therefore meets our view of a sensible forward progression in life expectancy given latest experience – coupled with a continuation of our approach to fully using the most recently available data.

Change in life expectancies (years)	Males age 65	Males age 85	Females age 65	Females age 85
A) CMI 2023 weights=100% (Isio previous best estimate)	-	-	-	-
B) CMI 2024 'simpler weights' – change vs. A	+0.2	+0.2	+0.0	+0.1
C) CMI 2024 H=0.5 (Isio updated best estimate) – change vs. A	+0.4	+0.2	+0.1	+0.2

Source: CMI & Isio analysis

Impact on liabilities

Switching from Isio's previous position in 2023 (using CMI 2023 with weights - 100%) to Isio's current position in 2024 (using CMI 2024 with H=0.5) gives the following example approximate liability changes (illustration below for males on a joint life basis).

From	To	Age 50	Age 65	Age 80
CMI 2023 1% long-term trend rate, weights=100%	CMI 2024, 1% long-term trend rate, H=0.5	+0.9%	+0.9%	+2.0%

The above impacts are smaller for females (as can be inferred from the life expectancy change figures in the first table on this page) and so the overall impact for any specific scheme will vary depending on the gender and age profile of the membership.

Other parameters

Long-term improvement rate parameter

- Given recent UK mortality experience it makes sense to reassess the "target" rate of improvement the CMI Model calibrates to in the longer term.

- Market practice gravitates to a long-term assumption of 1.5% p.a. for funding purposes and 1-1.25% p.a. for best-estimate purposes (e.g. accounting).

- Improvement rates had historically been less than 1% p.a. until a period from the mid-1970s to around 2010, when much stronger rates of improvement were 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 the necessary climate transition during the lifetime of most DB scheme members.

- Our view, therefore, is that it may be appropriate to utilise 1% p.a. for best estimate purposes at this current time.

- We recognise the subjectivity in this assumption and are comfortable 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 & Wales, which may not reflect a specific 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 2012-2022 but are heavily distorted by the significant mortality seen in the pandemic years, 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 most pension schemes an A parameter of 0% is likely appropriate, but up to 0.25% may be appropriate for additional prudence in funding valuations or where there is reason to believe a particular population may benefit from higher rates of mortality improvement in the short term. The latter may be the case where the scheme has higher than average pensions or a postcode analysis shows the population is expected to enjoy lower than average mortality.

Document classification: Public

The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.