

Demographic Services

December 2020

X Demographic assumptions

The influence of demographic assumptions on the value placed on pension scheme liabilities has increased significantly as life expectancies have increased and real discount rates have reduced.



Demographic assumptions have never been more important



Demographic assumptions are key features in numerous areas:

- ▶ Funding valuations
- ▶ Company accounting
- ▶ Setting factors for member options
- ▶ Assessing the value for money of risk transfer options



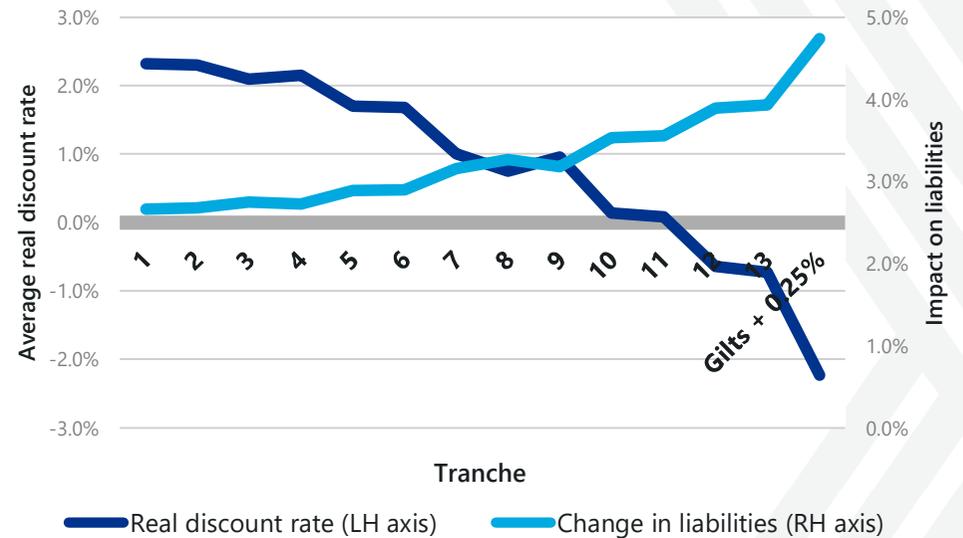
Actuarial models of life expectancy have become more complicated over time as modelling techniques develop:

- ▶ Adjustments to mortality base tables
- ▶ Initial Addition to Mortality Improvements parameter
- ▶ Long-term rate of mortality improvements



The short term impact of the COVID-19 pandemic on mortality rates is still unfolding and the long-term impact of a COVID-19 induced recession is uncertain. History suggests recessions can have dramatic effects on improvements in life expectancy.

Impact on liabilities of a one year change in life expectancy based on average real discount rates (from TPR scheme funding statistics)



The current 'low interest rate environment' has dramatically increased the financial significance of demographic assumptions. A one year increase in life expectancy could increase liabilities as much as 4%-5%.

Schemes exhibit a wide range of different characteristics, and demographic assumptions need to be scheme-specific. **XPS has developed cutting-edge tools to help trustees and employers understand the demographic profile of their schemes.**

X Our demographic services

Our Demographics team offers a range of services providing fully tailored analyses to suit the different requirements of different pension schemes.



Member analytics

- ▶ Guidance on the possible range of **adjustments to SAPS Series 3 base tables**
- ▶ Assess the socio-economic profile of your scheme's members to help set the **initial addition parameter** in the CMI projections model
- ▶ Help set the **proportion married** and **age difference** assumptions
- ▶ Assess the **vulnerability** of your scheme members
- ▶ Consider how members like to **access information**
- ▶ Consider likely **take up rates of member options**

Bespoke risk analysis*

- ▶ **Stochastic modelling** process
- ▶ Full analysis of the **unique longevity risks** faced by your scheme:
 - Base table risk
 - Idiosyncratic risk
 - Trend risk

**Typically only suitable for larger schemes (c. 5,000+ members).
Please speak to your XPS contact for more information.*

Longevity analytics

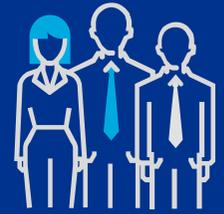
- ▶ Tailored analysis using detailed membership information
- ▶ Determine a **scheme-specific adjustment to SAPS Series 3 base tables**
- ▶ Assess the socio-economic profile of your scheme's members to help set the **initial addition parameter** in the CMI projections model
- ▶ Help set the **long term rate of improvement** in mortality in the CMI projections model

COVID-19 impact analytics

- ▶ **Longevity scenario analysis**, centred around the possible future impact of COVID-19 and tailored to the specifics of the scheme's membership
- ▶ Demonstrates a range of potential outcomes and their **impact on your scheme's liabilities**
- ▶ Help set longevity assumptions and **manage risk**

X Member analytics

Member Analytics analyses your scheme's membership by postcode against a wide range of publicly available data sources compiled by CACI to identify key features of your scheme's membership.



Scheme membership data

Postcode	Status
Gender	Age

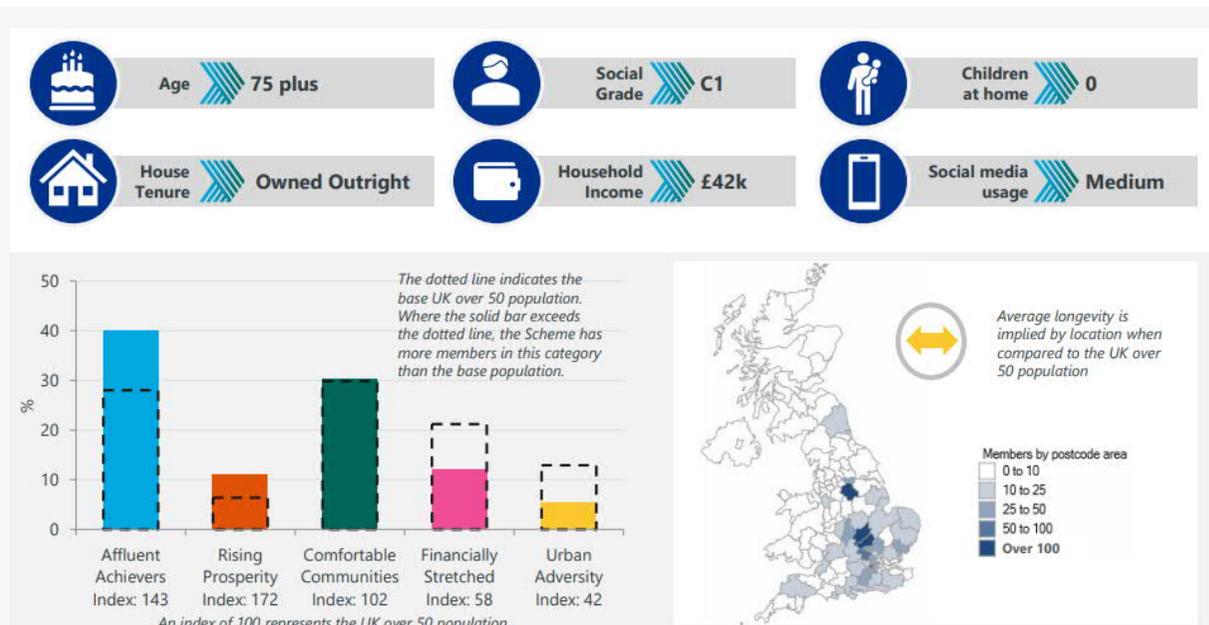


CACI database

ONS census data, Home Office data	The UK Household Longitudinal Study
British Marketing Survey	Surveys by Ipsos, Target Group Index (TGI) and others

Features of membership identified

The CACI database categorises the population by postcodes to identify certain features of members. These include income, health, vulnerability, Index of Multiple Deprivation scores, cohabiting information and insights into preferred access to information.



These features are then compared against a baseline population so you can see how your scheme's members compare. In this case, we compare against the XPS Data Pool population.

X Member analytics

Member Analytics can be used to refine assumptions such as longevity assumptions or the proportion of members with financial dependants, as well as identify optimal ways of engaging with your scheme's membership.



Range of adjustment to SAPS 3 base table mortality rates



85%-95%



Index of Multiple Deprivation (IMD) band informs Initial Addition (IA) in the CMI model

- > **IMD band**
- > **Best estimate IA**
- > **Prudent IA**



6
0.2%
0.3%-0.4%



Age & Health vulnerability



below average

Members are less susceptible to the underlying health conditions associated with COVID-19 and few are aged over 75, with age the key risk factor.



Financial and digital vulnerability



below average

Members are more financially aware than the XPS Data Pool population.



Best estimates for:

- > **Overall**
- > **Males**
- > **Females**



	Proportion cohabiting	Proportion married
> Overall	82%	72%
> Males	83%	71%
> Females	81%	73%



Age difference best estimate

- > **Overall**



1.9 years



Approach to finance



average

Members feel financial security in retirement is their responsibility and are likely to respond to options.



Social media activities



above average

Members may wish to engage with the Trustee using technology.

X Longevity analytics

Longevity Analytics uses detailed membership information to determine scheme-specific mortality assumptions for your scheme.



Longevity Analytics determines mortality assumptions specific to your scheme's membership using the results of multiple studies into mortality improvements and the mortality experience of a wider population with similar characteristics to your scheme's members. Life expectancy varies with lifestyle and groups of individuals with similar lifestyles should have similar life expectancies. Our Longevity Analytics model uses detailed membership information, focusing the analysis on two key areas that generally reflect the majority of differences in life expectancy: **pension size** and **location**.

Detailed membership data

Age	Status	Gender	Location	Pension	Salary	Service dates	Liability
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Our Longevity Analytics service helps you understand the current and future life expectancies of the members of your scheme and is split into three parts to ensure your mortality assumptions are fully tailored to the characteristics of your membership:

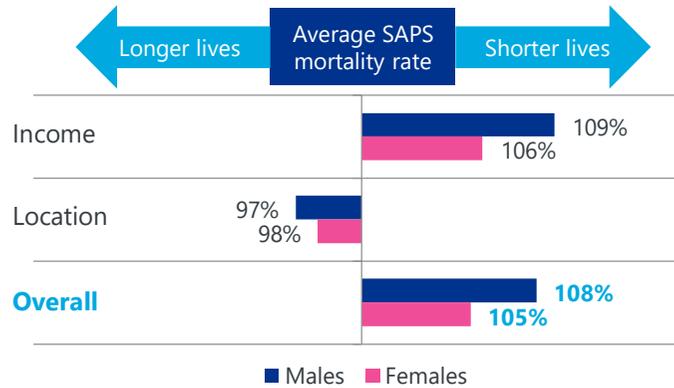
<h3>Base table analysis</h3> <p>By considering each of your scheme member's income and location, Longevity Analytics estimates how long members are currently predicted to live.</p> <p>Our analysis determines a scheme-specific adjustment that can be applied to the mortality base table to reflect the socio-economic characteristics of the membership.</p> <p>Average DB Pensioner 100% weighting</p> <p>< 100% Higher life expectancy</p> <p>> 100% Lower life expectancy</p>	<h3>Initial addition parameter</h3> <p>Analysis produced by the CMI has shown that recent mortality improvements have varied between socio-economic groups.</p> <p>Longevity Analytics allocates members by their postcode to an IMD band and an overall IMD score, weighted by liability, is calculated which can then be directly mapped onto an initial addition for future improvements.</p> <p>Possible range of initial addition (IA) parameters</p> <p>Lower IA Lower life expectancy</p> <p>Higher IA Higher life expectancy</p>	<h3>Future improvements analysis</h3> <p>To help predict how members' life expectancy may improve in the future, our Longevity Analytics assigns your scheme to a socio-economic group based on the income and location of your scheme members.</p> <p>The model then shows how mortality rates may improve for that group in the future under various 'real life' scenarios.</p> <p>Possible range of long-term rates of improvement (LTR)</p> <p>Lower LTR Lower life expectancy</p> <p>Higher LTR Higher life expectancy</p>
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X Longevity analytics

Longevity Analytics can be used to set the three key aspects of your scheme's mortality assumption for a fully tailored longevity solution.



Mortality rates in 2013 based on income and location



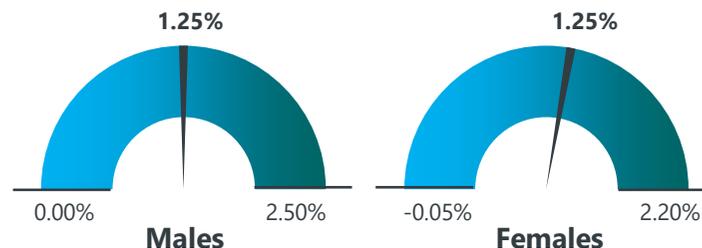
Our model determines **scheme-specific adjustments** to current mortality rates (SAPS Series 3 base tables) for males and females based on your scheme members' incomes and location. This is then used to determine an overall adjustment for your scheme that fully reflects your scheme members' characteristics.

Allowance for improvements in mortality rates from 2013 to 2020

Average IMD band	Suggested starting value for initial addition parameter	
	Best estimate	Prudent
5	(0.1%)	0.1%
6	0.1%	0.3%
7	0.2%	0.4%

Assessing the socio-economic profile of your scheme members can help set the **initial addition parameter** in the CMI mortality projections model

Long term improvements assumption from 2020 onwards



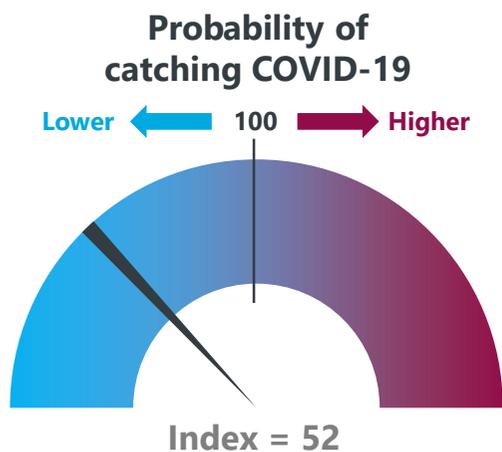
Future improvements scenario analysis can help set an appropriate **long term rate of improvement** in longevity in the CMI mortality projections model by illustrating how your assumption compares to the long term rates we would expect your scheme to experience under our range of pessimistic to optimistic future scenarios.

X COVID-19 impact analytics

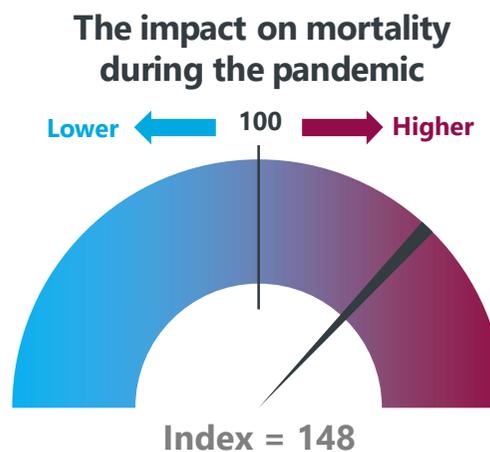


COVID-19 Impact Analytics assesses your scheme's members according to key risk factors that we believe will impact members' life expectancies over the course of the pandemic and into the future.

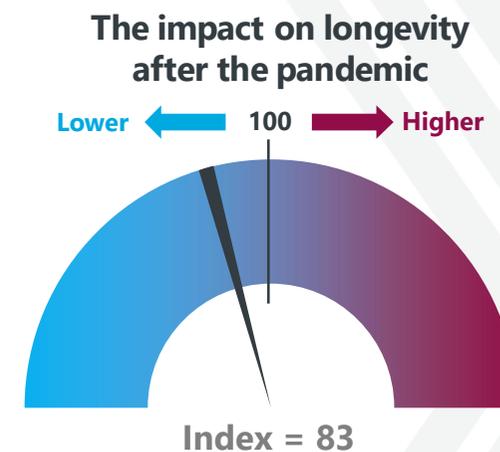
COVID-19 Impact Analytics considers the potential impact over the course of the pandemic and into the future under a range of different future scenarios. The model takes into account features of your scheme's membership in each scenario by measuring your scheme against key risk factors.



Influenced by the geographic location, age, sex and (if relevant) the occupation of your scheme's members. For example, if your membership is concentrated in highly impacted areas, for example densely populated areas with high case rates, your members are likely to have a greater probability of catching COVID-19.



Those who have a higher risk of dying from COVID-19 are those members who are males, older in age, in ill-health and living in deprived areas.



Influenced by the socio-economic group of the membership, and whether members did or did not contract COVID-19 in the pandemic. For example, the impact of any resulting recession is likely to be greater on those from more deprived areas. However, the pandemic may have removed some of the less healthy members from the population, leaving a population that is overall healthier than previously, that may on average live longer than we expect now.

Index of 100 represents the average across the general population of the UK.

Anything above 100 and the probability or impact is greater than the average across the general population of the UK and anything below 100, the probability or impact is lower than average.

X COVID-19 impact analytics

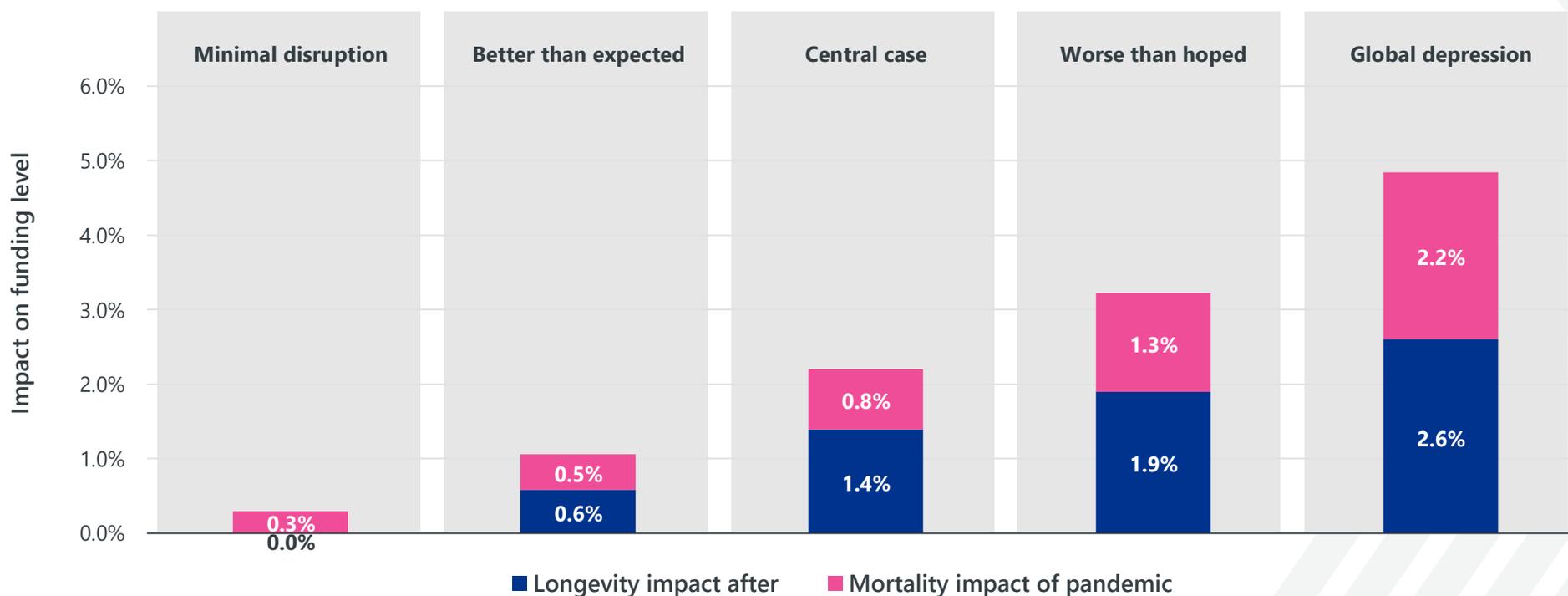
Our model assesses the impact on your funding level due to the longevity impact of COVID-19 in each of five possible future scenarios, ranging from optimistic to pessimistic.



The overall impact is made up of:

- > **The impact on mortality rates of the pandemic** – i.e. the impact on mortality directly attributable to those who contracted COVID-19.
- > **The impact on future improvements in longevity after the pandemic** – i.e. the impact on mortality as a result of the ensuing recession, and any excess deaths not directly caused by COVID-19 over the course of the pandemic.

The results are specific to your scheme, taking into account the features of your scheme's membership and your scheme-specific key risk factors.



X Summary



Our **Demographic Services** help trustees and employers understand the demographic profile of their schemes.

Understand your members

- ▶ Assess the vulnerability of your scheme members
- ▶ Consider how members like to access information
- ▶ Consider likely take up rates of member options

Fully tailored longevity assumptions

- ▶ Scheme-specific adjustment to SAPS Series 3 base tables
- ▶ Initial addition parameter in the CMI projections model
- ▶ Long term rate of improvement in mortality in the CMI projections model

Choice of other demographic assumptions

- ▶ Proportion married assumption
- ▶ Age difference assumption

Integrated Risk Management

- ▶ Establish how exposed your scheme funding level could be to longevity impacts
- ▶ Analyse risk by testing the impacts against covenant strength

Understand the implications of COVID-19

- ▶ Predict the potential impact of COVID-19 under a range of scenarios
- ▶ Insight into those vulnerable to COVID-19
- ▶ Understand exposure to the short and long term impacts of COVID-19
- ▶ Judge the actions required

Schemes exhibit a wide range of different characteristics. Demographic assumptions need to be scheme-specific. Better understanding will mean better decision making, leading to better outcomes for trustees, employers and members.

Contact us to discuss how we can help you to understand your scheme's unique characteristics.



Find out more

For further information on our Demographic Services, please get in touch with Steve Leake, Dan Auton or Matthew Plail.

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Registration

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