

WHITE PAPER

Andrew Gething
Managing director, MorganAsh



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Assessing the assumption of mortality for blue- and white-collar pension scheme members

This in-depth study shows that mortality assumptions for blue- and white-collar scheme members are not typically reliable.

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About the author

Andrew Gething is the managing director of MorganAsh; he founded the company in 2004, to bring greater innovation to financial services. MorganAsh provides medical underwriting services for the life insurance and pensions industry, and has assessed the health and mortality of thousands of individuals. In 2011, Andrew introduced a service to determine the health of individuals for pension annuities. This demonstrated that poor medical assessments were leading to reduced pensions for thousands of pensioners. Subsequently, the FCA fined several insurance companies millions of pounds – and insisted they review and upgrade the pensions of thousands of their customers.

In 2012, Andrew extended this service to defined benefit pensions – now called the 'medical underwriting mortality study'. The service demonstrated that gathering real health data from scheme members provided a superior method to valuing pension schemes, compared to the practice of using aggregated postcode data. In 2013, this service was extended to provide medical data to insurance companies when buying out pensions, called 'medical underwriting bulk annuity'. These innovations were subsequently recognised by the industry, with MorganAsh notably winning the 'Most Innovative Actuarial/Risk Consultancy Provider of the Year' in 2016.

MorganAsh helps many companies obtain better data for their pension schemes – allowing them to amend their strategies for the better interest of corporates, trustees and scheme members alike. In 2020, The Pensions Regulator included medical underwriting in its consultation as part of a drive to improve the quality of data used in pension valuations – and to reduce the reliance on assumptions.

Assessing the assumption of mortality for blue- and white-collar pension scheme members

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Introduction

The health of white-collar executives versus blue-collar workers has been widely assumed to differ, especially when compiling mortality assumptions for defined benefit pension schemes. White-collar executives have typically been assumed to be healthier than blue-collar workers – and hence a lower mortality rate has been assumed for an executive scheme than a workforce scheme.

We carried out an in-depth study and we have found this assumption to be highly unreliable. Amongst our results, we found that:

- the incidence of high blood pressure in blue-collar workers was 26.3%, compared to 24.5% in white-collar executives.
- the incidence of diabetes in blue-collar workers was 6.7%, compared to 6.5% in white-collar executives.

Both of these indicators – and others which have a direct impact on mortality, along with the lack of difference in incidence between categories of workers – contradicts the use of separate mortality assumptions for executive and workforce pension schemes. Since white-collar executives often have higher salaries, and hence greater pension liabilities than blue-collar workers, this assumption can be material for those companies with executive pension schemes. We therefore recommend that pension schemes which assume lower mortality for executives consider the real evidence for this.

The catalyst for undertaking this research was a medical underwriting mortality study (MUMS) which included two schemes, each for the same company, one an executive scheme and the other for the majority of employees. When the health of the scheme members was assessed, the assumption of 'better health for executives' turned out to be incorrect. We looked across our schemes to retest this blue- and white-collar assumption in greater depth. This paper sets out the results of that study.

Source data

The data in this paper was aggregated from MorganAsh's medically underwritten mortality studies (MUMS). MUMS assess the health of defined benefit scheme members, to provide more accurate mortality estimates for each person – and then for the overall scheme.

The aim of the surveys was to gather evidence which would improve the accuracy of assumptions used in scheme valuations. In most cases, surveys were targeted to include ages from ~50–80 – and to exclude the very small liabilities.

The data is from 43 individual defined benefit scheme MUMS projects. These included a total of 7,428 scheme members who responded to the surveys; the surveys were undertaken between 2013 and 2019, inclusive. The age at the time of study was used in the analysis. Ages ranged from 37 to 112; the mean age was 67. The spread of ages was similar for each scheme – as is typical of defined benefit schemes. Projects were undertaken by various pensions consultants.

The surveys covered a wide range of industries, including:

- architecture
- building services
- charity
- construction
- education
- engineering
- financial services
- food manufacturing
- logistics
- manufacturing
- pharmaceuticals
- professional services
- publishing

Assessing blue- and white-collar schemes

Depending on the industry, and nature of the scheme, members were allocated as blue or white collar. As there is no strict definition of blue or white collar, a common-sense approach was used to define each scheme – in the same way actuaries would make assumptions for valuations.

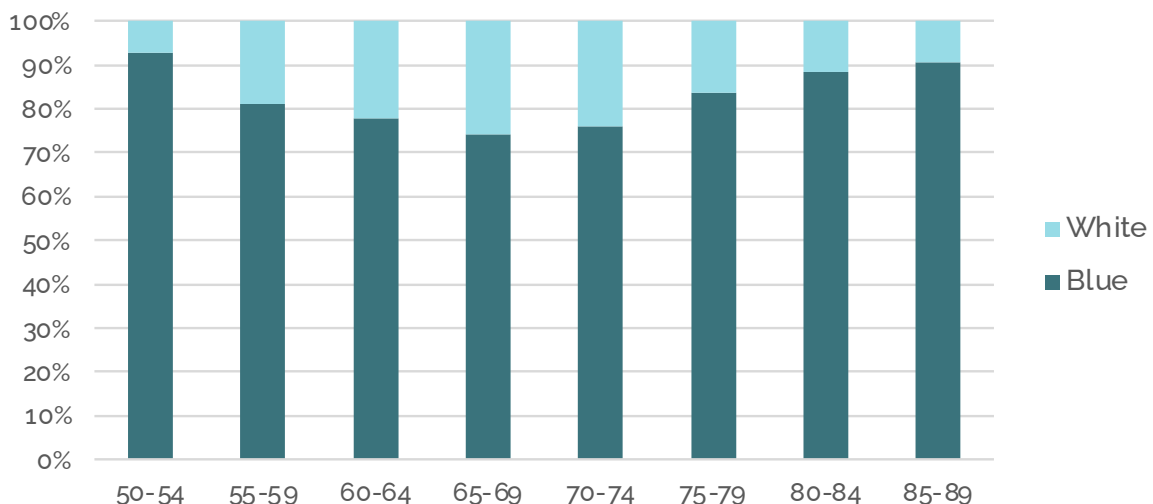
Not surprisingly, there were more blue-collar scheme members than white collar, with 79% blue collar and 21% white collar. This may be skewed from the general defined benefit population, as some projects focused on higher liabilities, and so assessments were only undertaken on the executive white-collar scheme members.

	Female	Male	Total
Blue	20.9%	58.3%	79.2%
White	7.1%	13.7%	20.8%
Grand total	28.0%	72.0%	100.0%

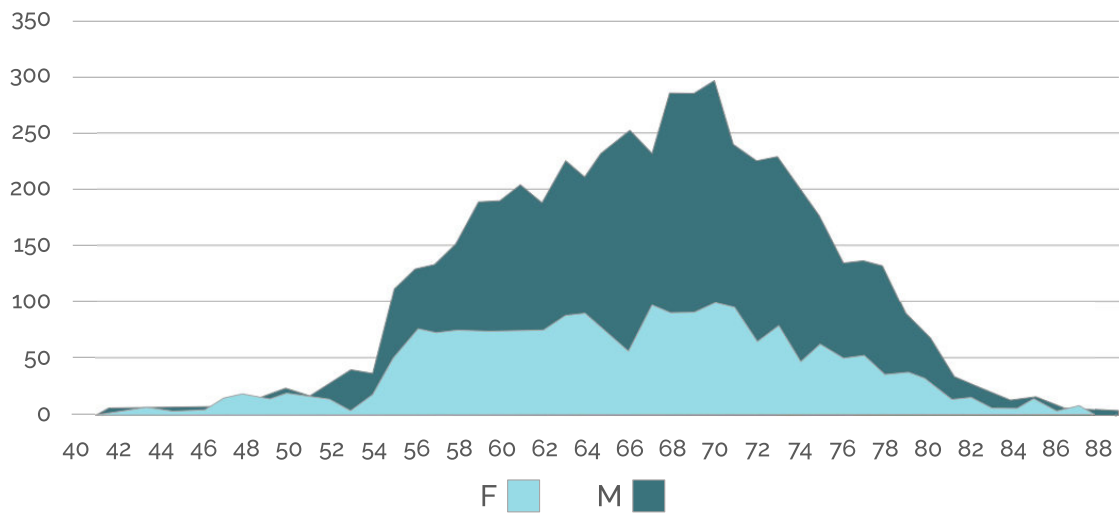
72% of scheme members were male and 28% of scheme members were female. There was a reasonable spread of white-collar scheme members across the age bands.

Age range of sample

Make up of blue and white collar by age band

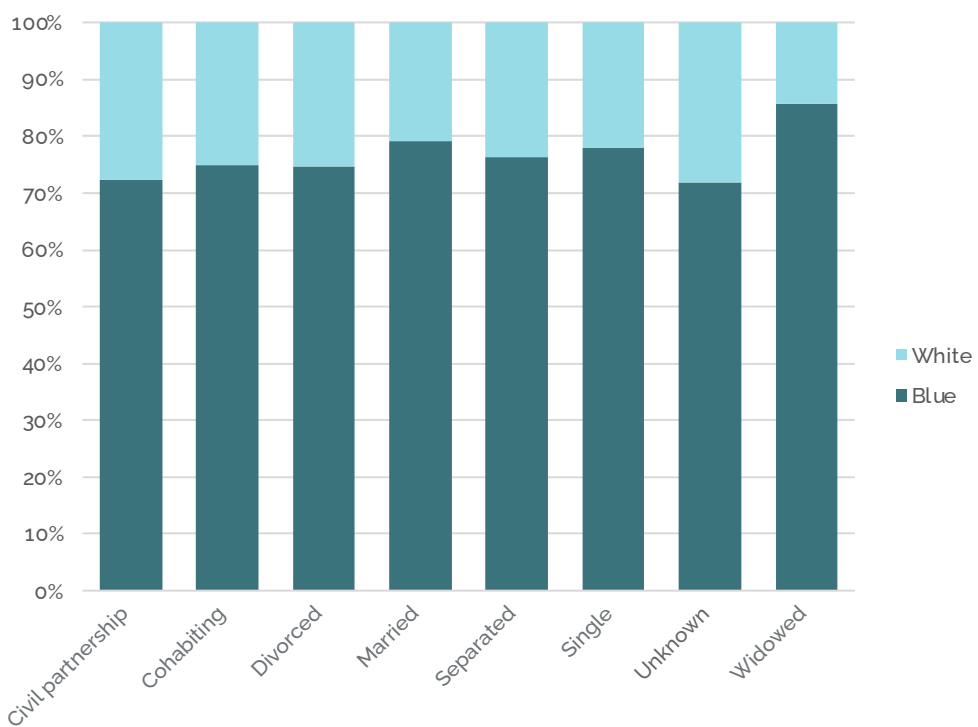


Number of scheme members by age and gender



Marital status across the sample

There was little difference in marital status across the two categories



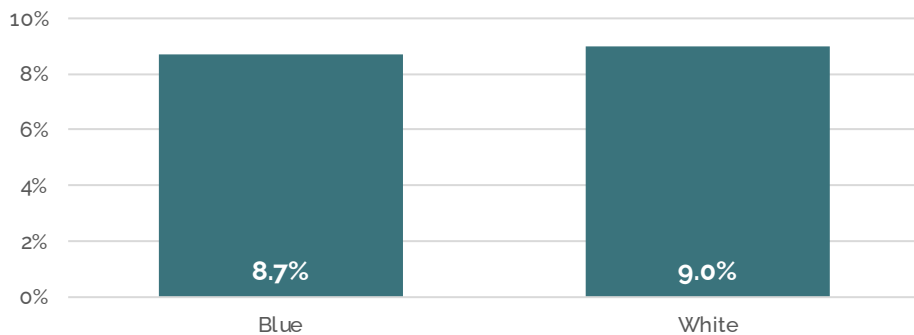
Comparison of lifestyle

The lifestyles of the two cohorts were compared for various conditions.

BMI

When assessing body mass index, we categorised as 'heavy build' with a BMI of >30 – and this impacts life expectancy. Note: >30 is categorised as obese, as defined by the NHS, with a BMI of 25–29.9 being overweight. The mean number of scheme members with a BMI of >30 is 9.0% for white collar and 8.7% for blue collar.

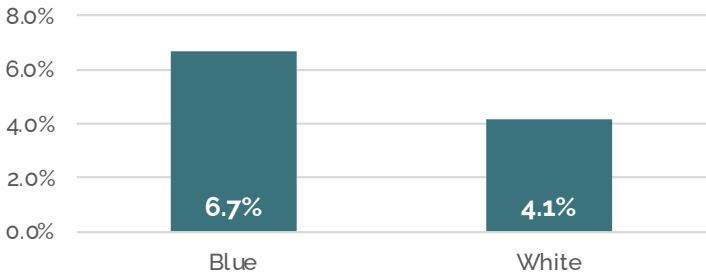
Comparison of heavy build



Smoking

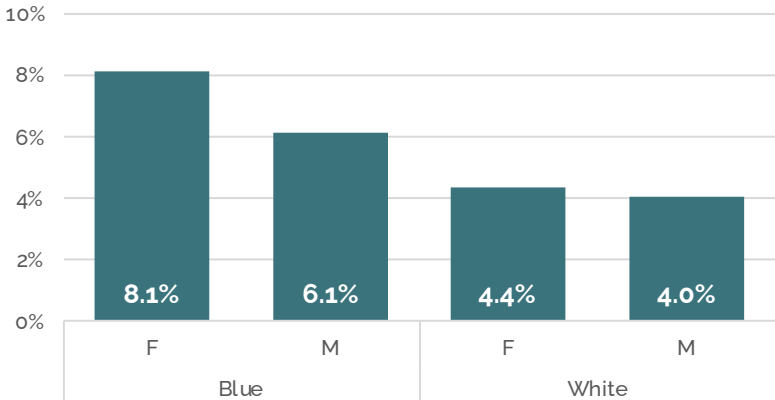
Smoking is slightly more prevalent in blue-collar scheme members, at 6.7% compared to 4.1% for white collar; the figures for females were slightly higher in the blue-collar group. This should be put in perspective and compared to previous smoking levels: prior to being banned in public spaces, around 20–25% of the adult population smoked.

Comparison of smokers



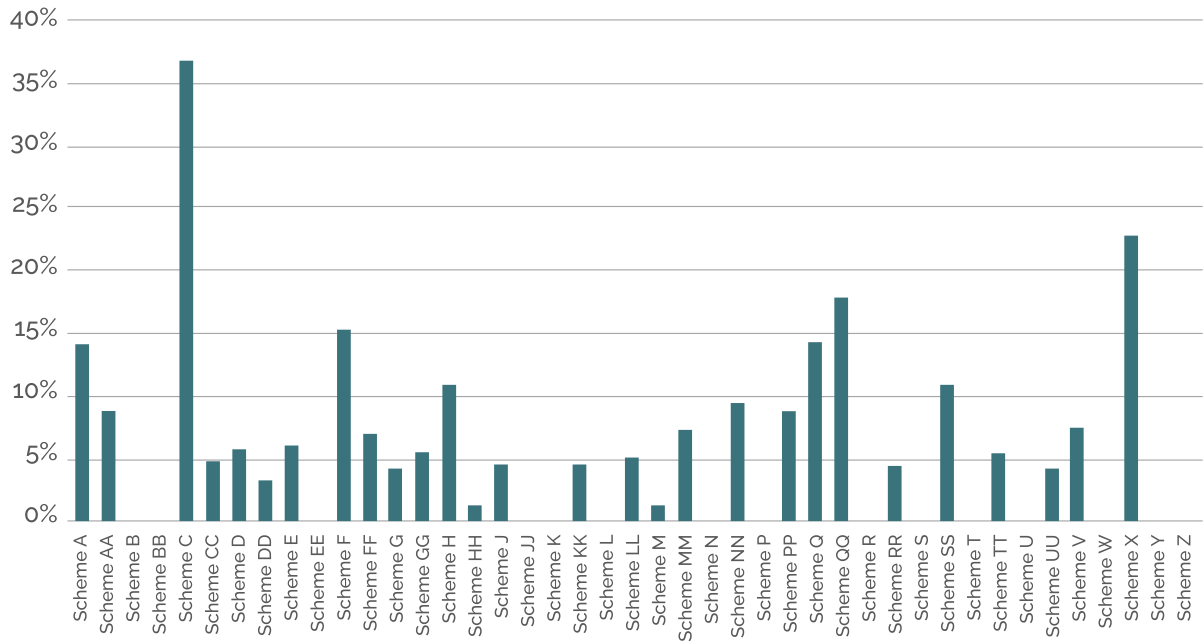
When broken down by gender, it can be seen that a higher proportion of females smoked than males in both categories.

Comparison of smokers by category and gender



The slightly higher level of females who smoke is offset, with only 28% of scheme members being female and 72% being male.

Proportion of smokers, per defined benefit scheme



A typical justification for a higher mortality for blue-collar workers than white-collar workers is the trend for blue-collar workers to have a poorer diet and lifestyle – and hence higher BMI. The actual BMI figures for these schemes don't correlate to this assumption, and the smoking difference is equally relatively small.

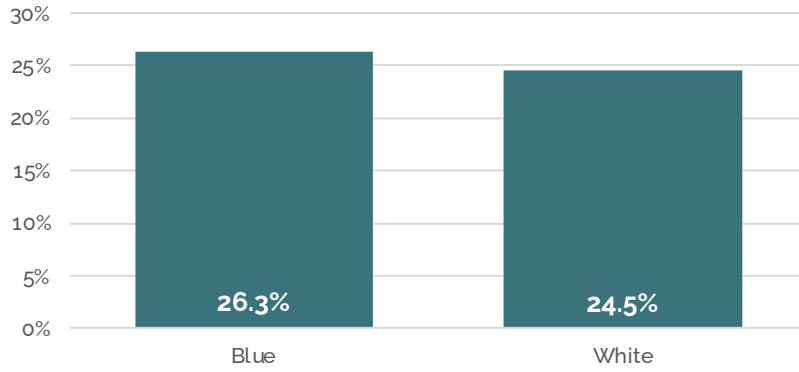
Comparison of health

We compared the health of blue- and white-collar scheme members for the main condition groups. Note, if a scheme member is suffering from multiple conditions, then they are counted for each condition. The graphs show the percentage of scheme members suffering with a condition, to a level that would materially impact their mortality, itemised between the two groups of white and blue collar.

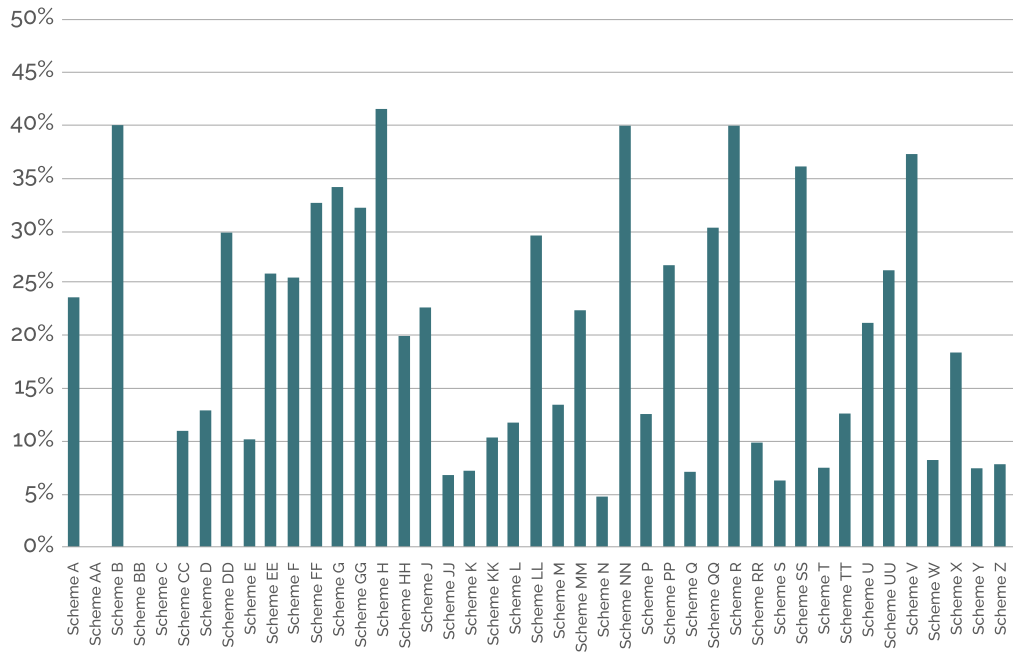
Conditions are categorised as:

- Cancers
- Cardiovascular
- Diabetes
- Digestive
- High blood pressure
- Neurological conditions
- Respiratory conditions
- Strokes
- Miscellaneous conditions (all others not in the above list)

Comparison of high blood pressure

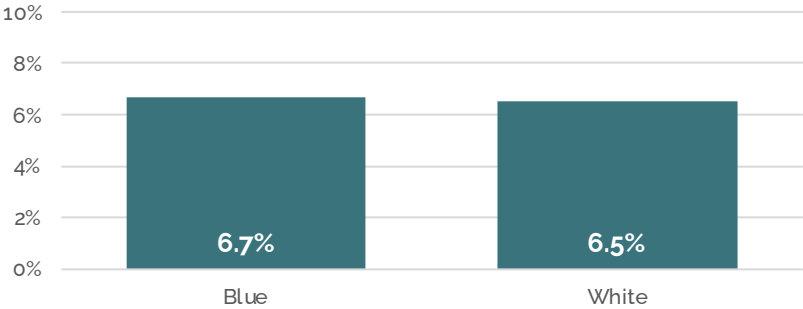


Proportion of scheme members with high blood pressure

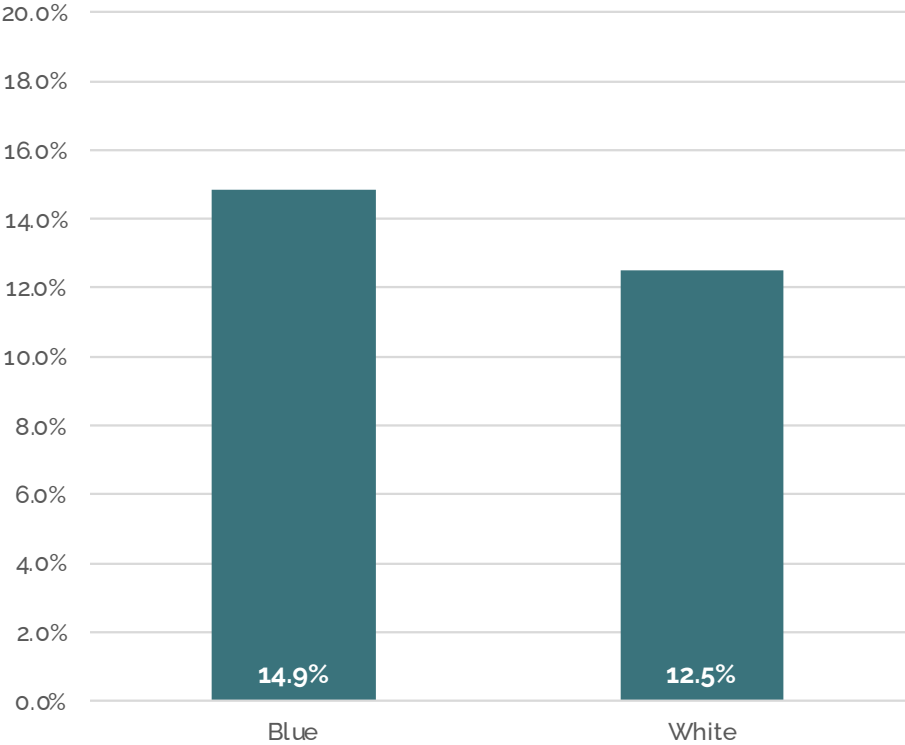


Comparison of diabetes

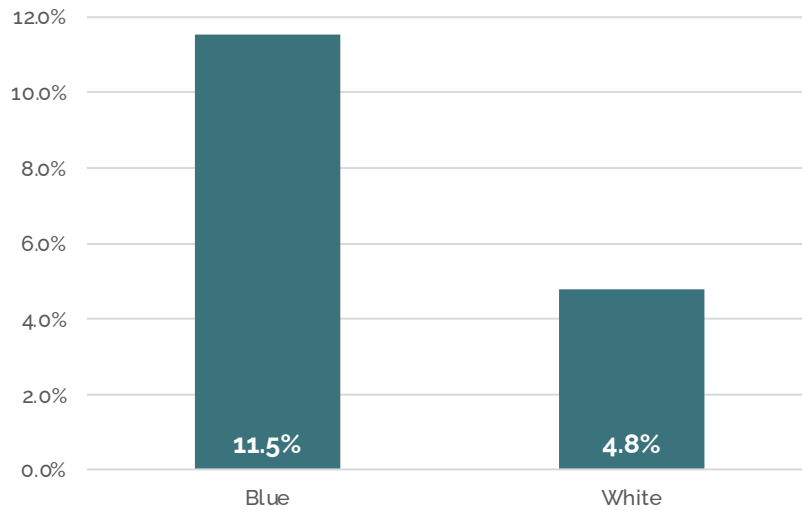
Comparison of diabetes shows little variation, with blue-collar workers just slightly higher at 6.7%.



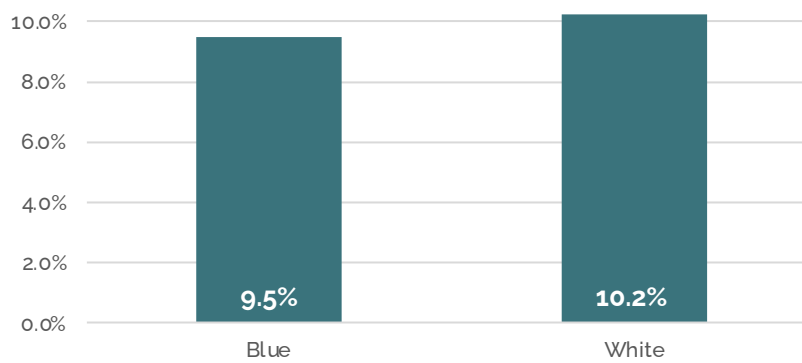
Comparison of cardiac issues



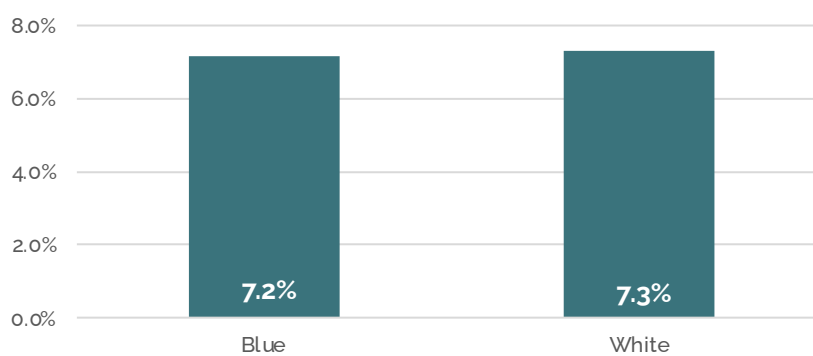
Comparison of strokes



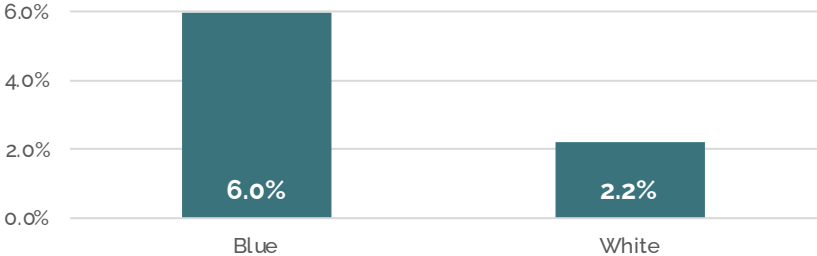
Comparison of cancers



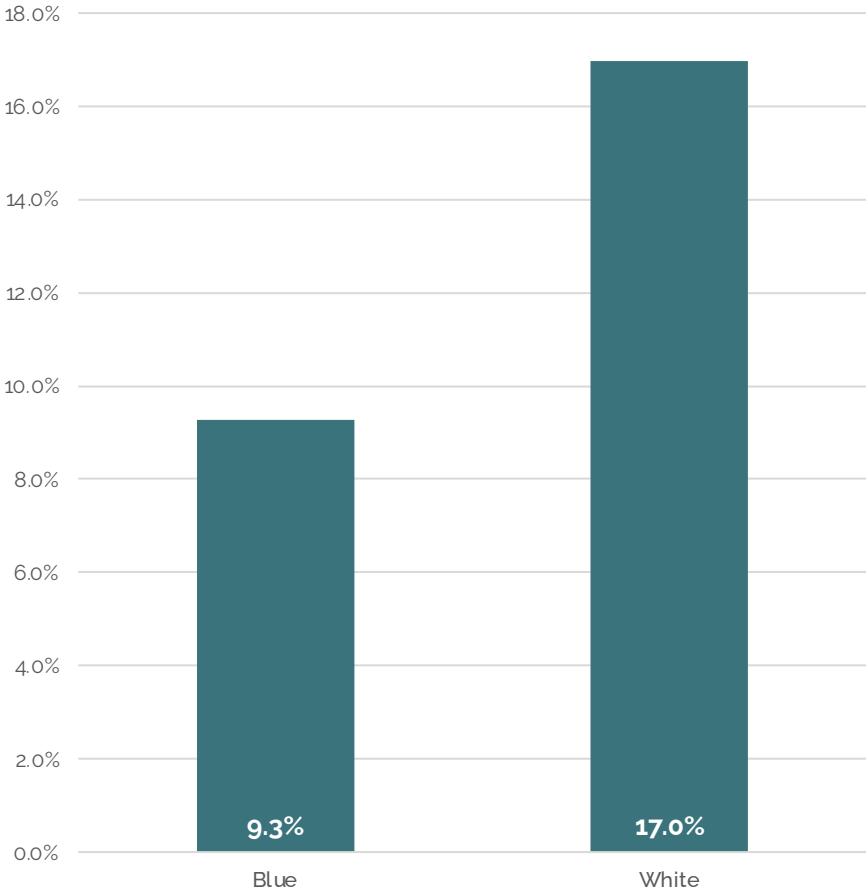
Comparison of respiratory conditions



Comparison of digestive disorders



Comparison of miscellaneous conditions



Miscellaneous conditions are essentially any that don't fall into the above categories; they also include rarer conditions.

Summary by condition

We summarised the previous conditions, although there is some duplication in the numbers, so these cannot be summated.

Lifestyle/condition	Blue collar	White collar	Difference
BMI	8.7%	9.0%	0.3%
Smoking	6.7%	4.1%	-2.6%
Cancers	9.5%	10.2%	0.7%
Cardiovascular	14.9%	12.5%	-2.4%
Diabetes	6.7%	6.5%	-0.2%
Digestive	6.0%	2.2%	-3.8%
High blood pressure	26.3%	24.5%	-1.8%
Neurological	0.4%	0.0%	-0.4%
Respiratory	7.2%	7.3%	0.1%
Strokes	11.5%	4.8%	-6.7%
Miscellaneous	9.3%	17.0%	7.7%

Assessing blue- and white-collar mortality

As individuals can have multiple conditions, the above health information cannot be summated to get an overall view. What can be summated, as it is based on the individual, is the mortality estimate.

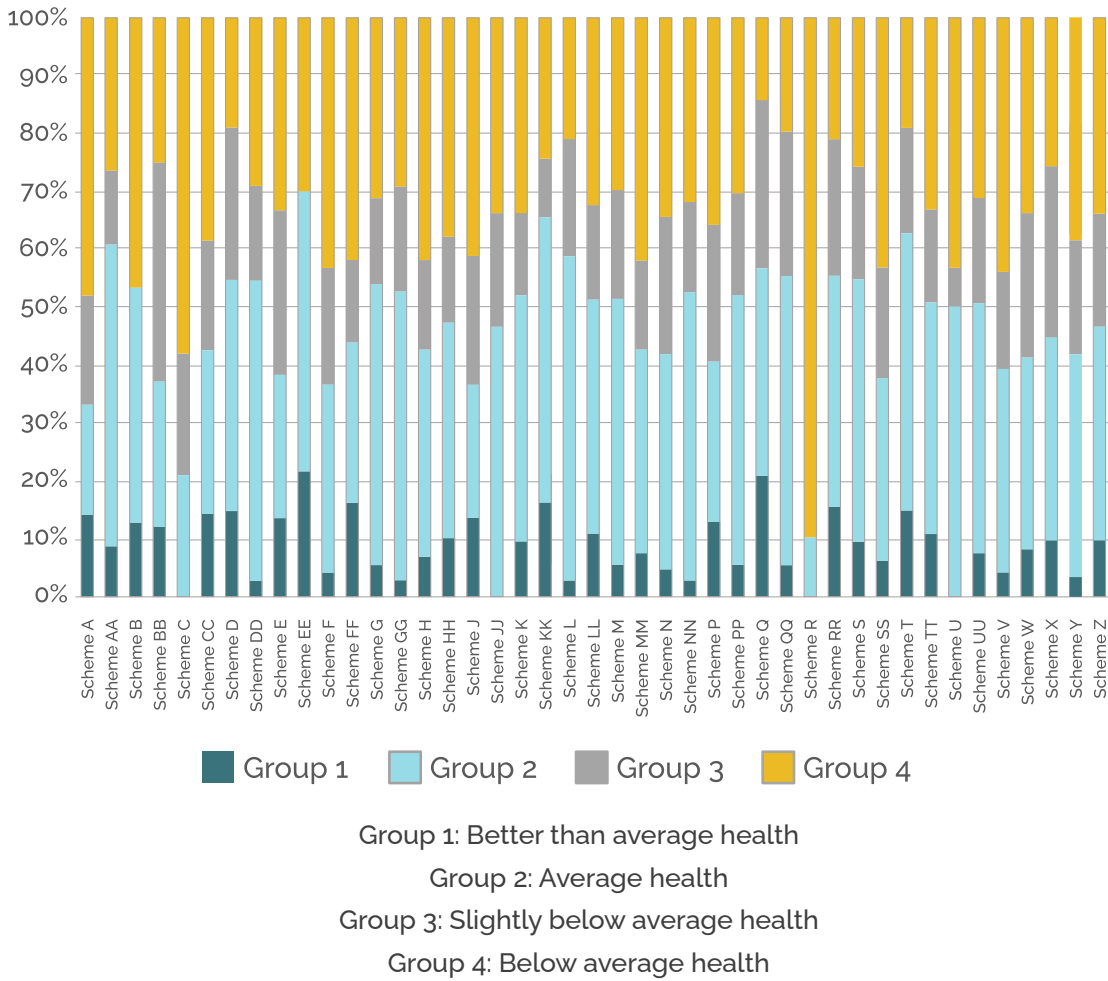
Mortality data

Each scheme member was medically underwritten and given a mortality loading. Mortality loadings are grouped together into the following categories:

Group	Title	Description	Mortality loading
1	Better than average health	Lives displaying credit risk features in terms of lifestyle, including cardiovascular risk factors, but with no debit ones	-25% loading
2	Average health	Unremarkable risks whose future mortality (and thus longevity) is expected to be in line with the base mortality	0% loading
3	Slightly below average health	Lives with minor debit features; in practice, these will often be 'average smokers'	+25% loading
4	Below average health	Lives whose health is significantly impaired; assessments are individually calculated according to the risk factors present	>50% loading

The graph below shows the spread of mortality loadings for the different pension schemes. It can be seen the health, and hence the mortality loading, varied greatly between individual schemes.

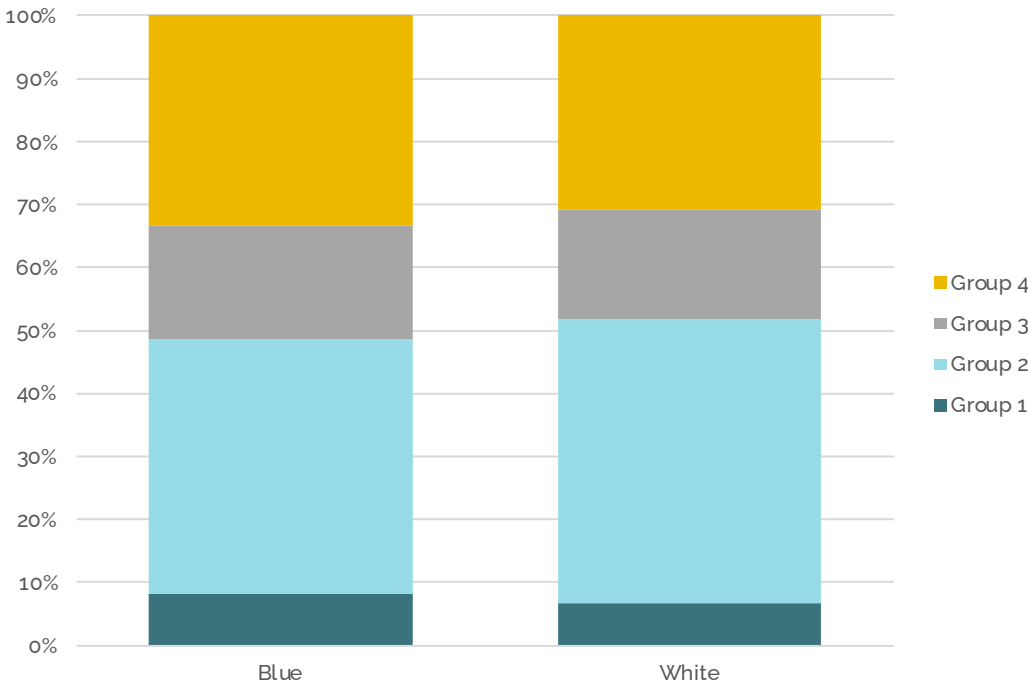
Mortality group, by defined benefit scheme



Mortality for blue- and white-collar schemes

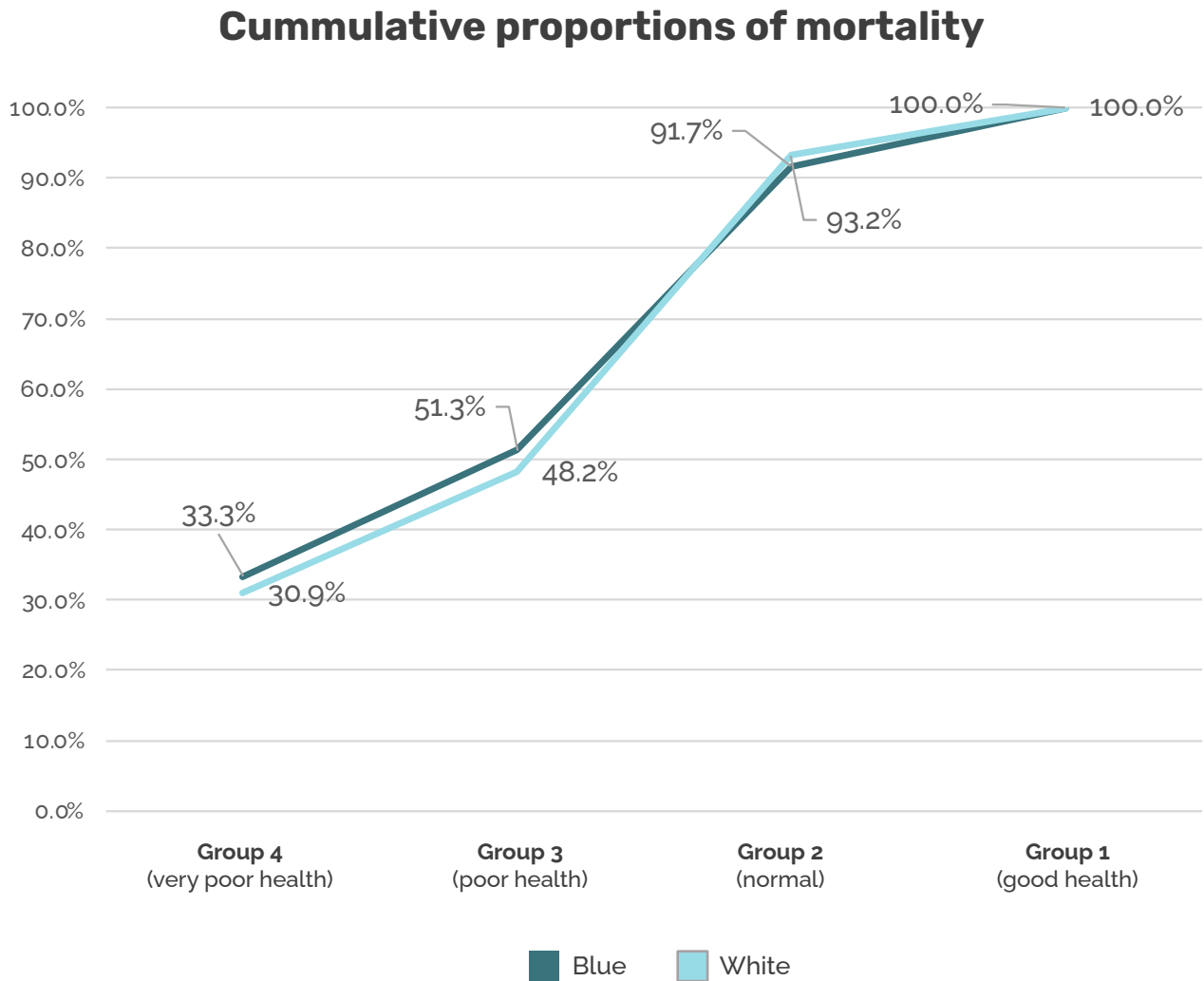
The graph below shows the mortality groups for the blue- and white-collar scheme members.

Comparison of mortality for blue- and white-collar scheme members



What is surprising is the similarity of the mortality for the two groups. The blue-collar workers have 2.4% more scheme members of very poor health (group 4), 0.7% more of poor health, 4.6% fewer of normal health and 1.5% more very healthy scheme members, when compared to the white-collar scheme members.

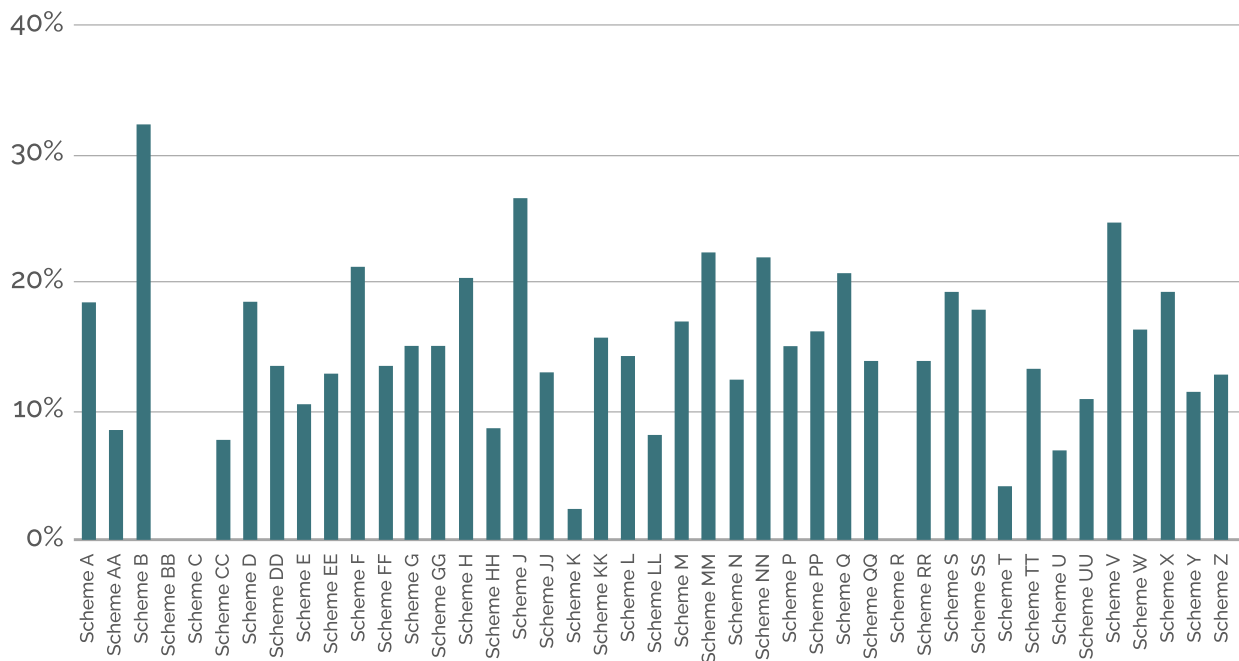
The graph below shows these mortality proportions as a cumulative graph, to aid comparison.



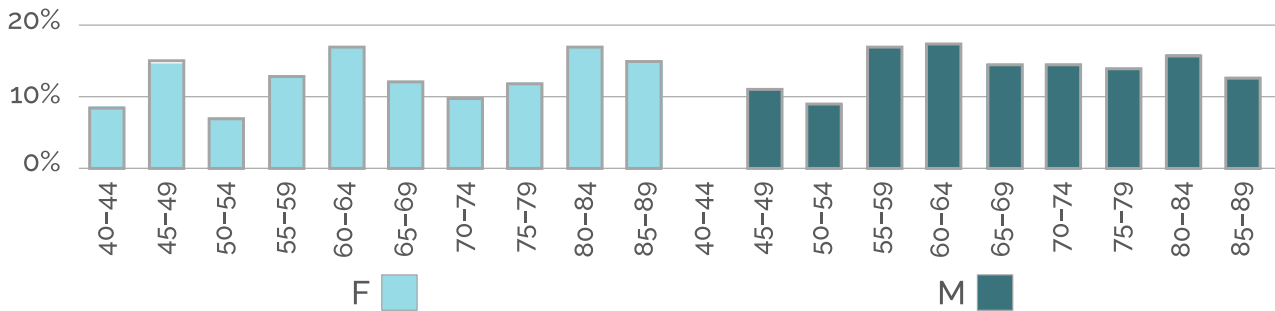
Impact of Covid-19

Clearly, the Covid-19 pandemic has had a marked impact on mortality, especially in the elderly population – and hence highly likely within the defined benefit pension schemes. Most of our studies were undertaken prior to the Covid-19 pandemic, and we have not yet had the opportunity to compare mortality from Covid-19 for these schemes. Overall, the medical evidence to date indicates that those in ill health are more susceptible to Covid-19, so we are able to assess which members are at higher risk. We believe schemes will have a far better chance to understand the impact of Covid-19 (and any similar future viruses) when the underlying health of the scheme members is properly understood – in comparison to trying to forecast this from postcode-type modelling.

Proportion of scheme members at high risk from Covid-19



Proportion of scheme members susceptible to Covid-19, by age and gender



Regulation

The Pensions Regulator has, for some time, been calling for improved evidence when making assumptions when estimating for mortality valuations. Its consultation document, *Defined benefit funding code of practice*, will shape a revised code of practice. The consultation requested views on how assumptions are made for assessing mortality for schemes, notably the practice of using postcode-based assumptions compared to real data from medically underwritten mortality studies. It is hoped this paper helps trustees, actuaries and sponsors in the revaluation of these options.

Conclusion

The data gathered when comparing the health of white-collar executives and blue-collar workers is such that we do not believe that there is sufficient evidence to support the use of different mortality tables for the two groups. Whilst blue-collar scheme members are of marginally worse health and increased mortality, this difference is small, and importantly – as the individual scheme member analysis shows – this does vary between schemes.

We therefore suggest that making sweeping assumptions on mortality, based simply on blue- or white-collar differentiation, is dangerous, potentially discriminatory – and could be misleading for individual schemes where it can have a material impact on the scheme valuation.

Trustees and pension scheme sponsors should therefore urgently review such assumptions made in their scheme's valuation. With the increasing demand for evidence, a solution is to more accurately determine scheme members' health – to improve the mortality estimate and hence the scheme's valuation.



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