MorganAsh

Assessing the assumption of mortality for blue- and white-collar employees

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Contents

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Introduction

The health of white-collar executives vs. blue collar workers has widely been assumed to differ 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 lower mortality has been assumed for the executive scheme than the workforce scheme.

In a recent study that we have carried out 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 to be 26.3% compared to 24.5% in white-collar executives;
- the incidence of diabetes in blue-collar workers to be 6.7% compared to 6.5% in white-collar executives.

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

As background, the catalyst for carrying out this study was a recently completed medical underwriting mortality study ("MUMS") including two schemes for the same company, one being 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 hence looked across our schemes to re-test the blue- and white-collar assumption. This paper sets out the results of that study.

Source data

The data used in this paper was aggregated from MorganAsh's Medically Underwritten Mortality Studies (MUMS). MUMS assess the health of defined benefits scheme members, to provide mortality estimates for each scheme member – and then for the overall scheme.

The aim of the surveys was to gather evidence which improved 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 benefits 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 is 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 benefits schemes. Projects were undertaken by various pensions consultants.

The surveys covered a wide range of industries including:-

- Architecture
- Building
- Building Services
- Charity
- Education
- Engineering
- Financial services
- Food manufacturing
- Logistics
- Manufacturing
- Pharmaceuticals
- Professional Services
- Publishing

Assessing blue- and white-collar schemes

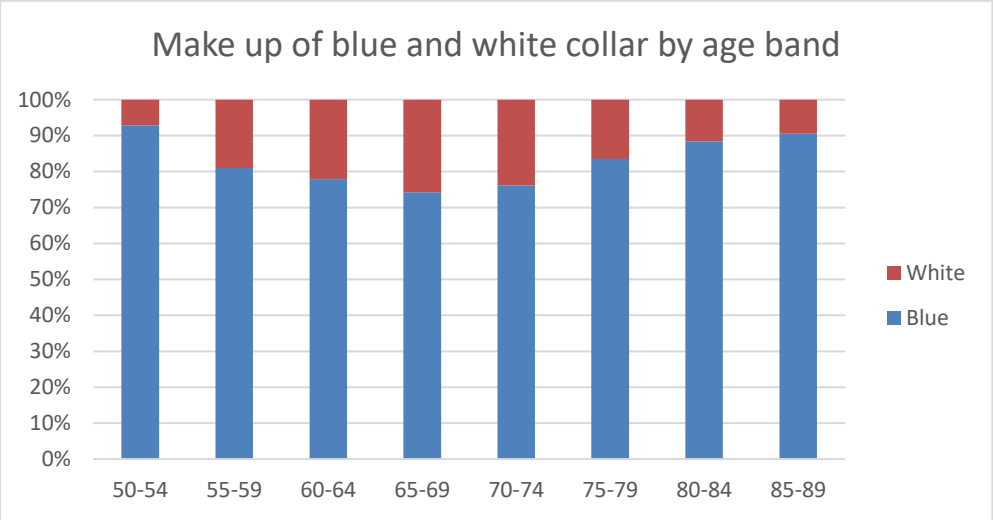
Depending on the industry and nature of the scheme, members were allocated as blue or white collar. As there would appear to be no strict definition of blue of white collar a common-sense approach was used to define each scheme, in the same way actuaries would make assumptions for valuations.

Not surprising, there were more blue-collar employees than white collar, with 79% blue collar and 21% white collar. This may be skewed from the general DB population, as some projects focused on the higher liabilities, and hence 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%**

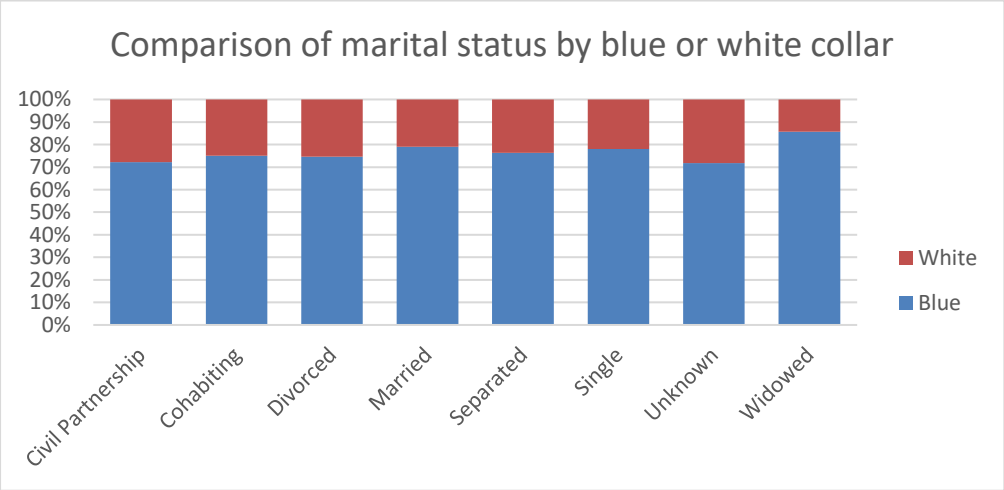
28% of Scheme members were female and 72% male. There was a reasonable spread of white-collar scheme members across the range bands.

Age range of sample



Marital status across the sample

And there was little difference in marital status across the two categories.

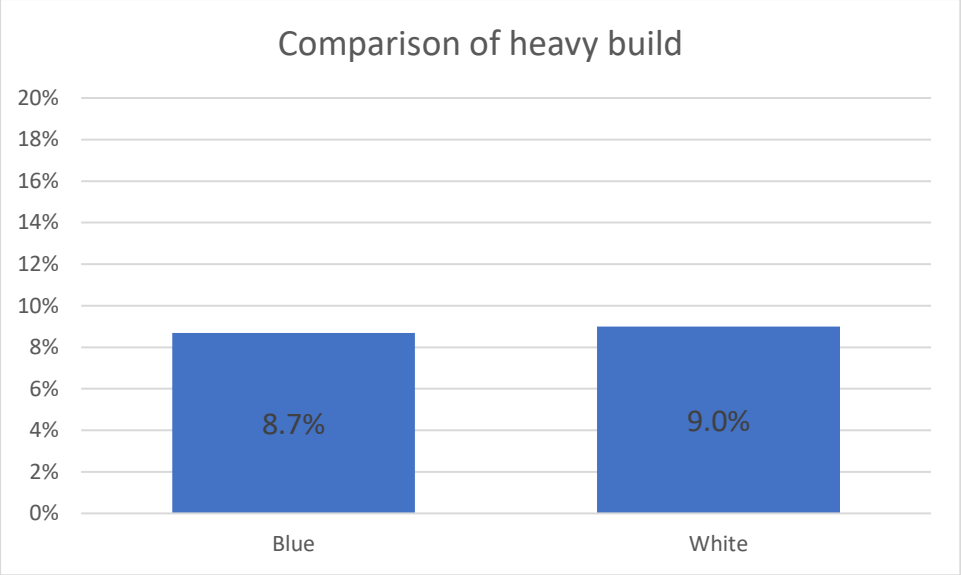


Comparison of lifestyle

The Lifestyle of the two cohorts is compared for various conditions.

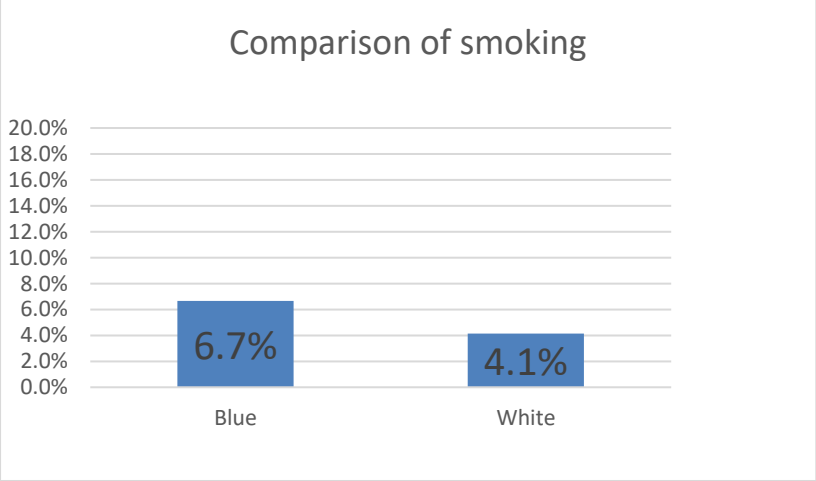
BMI

When assessing Body Mass Index, we categorise as “heavy build” for those over a BMI of 30 and hence that impacts life expectancy. Note, over 30 is categorised as Obese as defined by the NHS, with a BMI or 25-29.9 being overweight. The mean number of scheme members with a BMI of over 30 is 9.0% for White collar and 8.7% for blue collar.

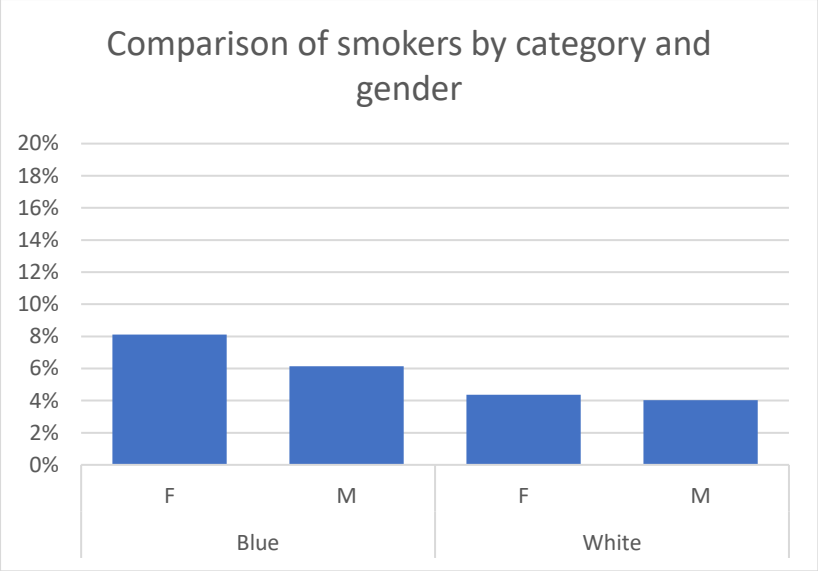


Smoking

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



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



The slightly higher level of ladies smoking is offset with only 28% female and 72% male

Typical justification for a higher mortality for blue collar than white collar is the trend for blue collar to have poorer diet, 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.

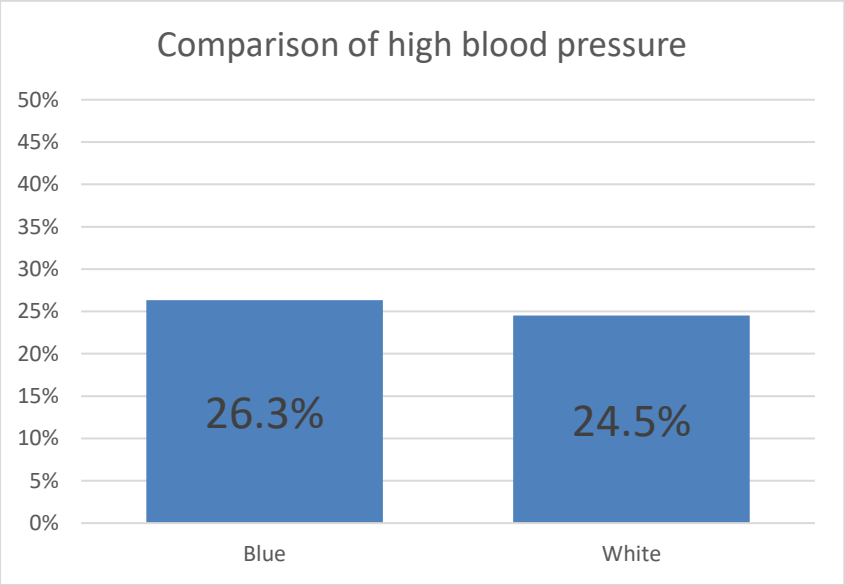
Comparison of health

We compare the health for 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 impact their mortality, itemised between the two groups of white and blue collar.

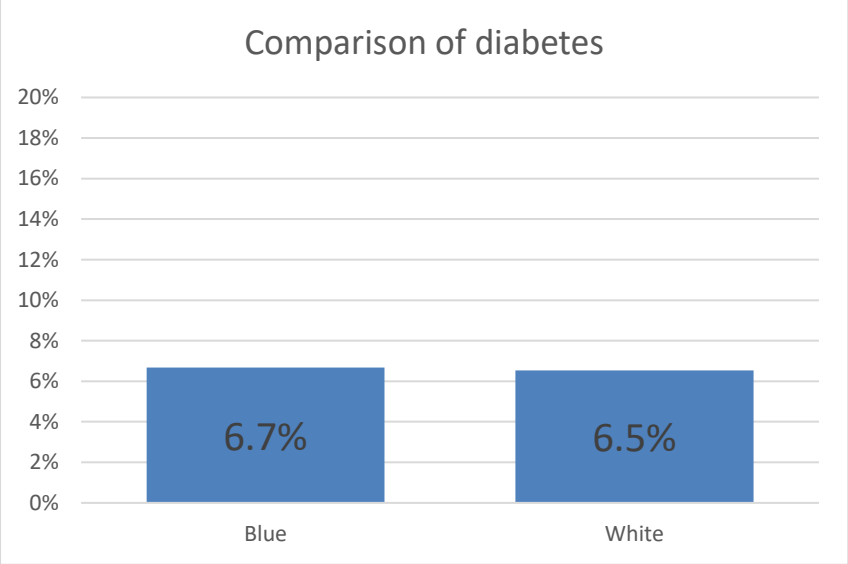
Conditions are categorised into the following categories.

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

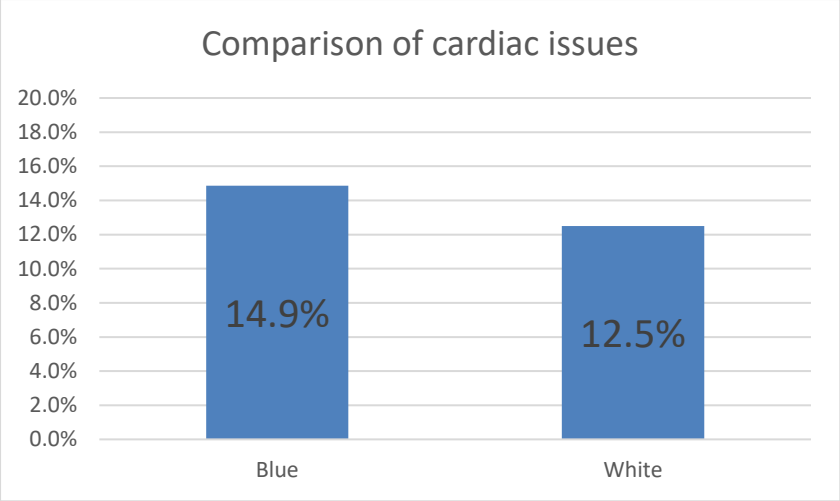
High blood pressure



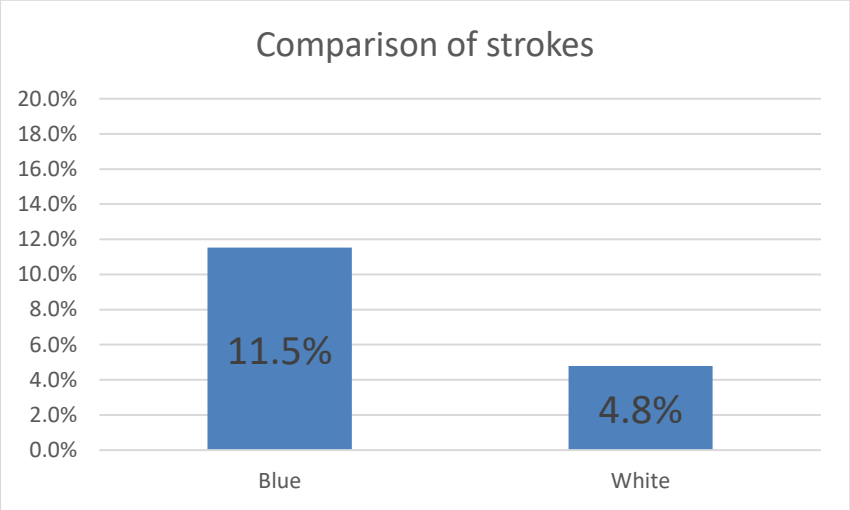
Diabetes



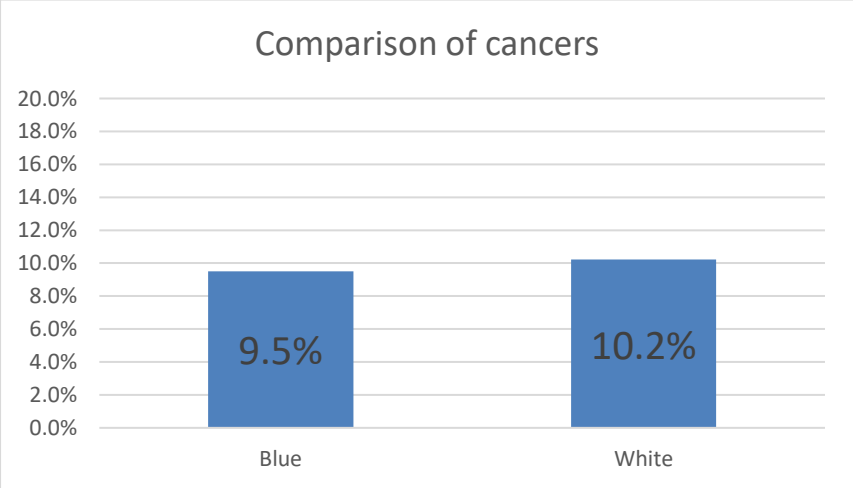
Comparison of Diabetes shows little variation, with Blue collar just slightly higher at 6.7% over 6.5% for white collar.



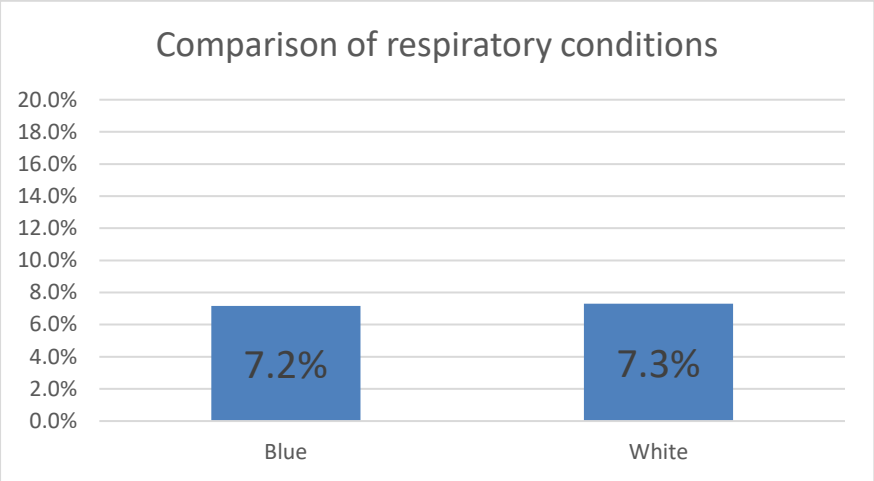
Strokes



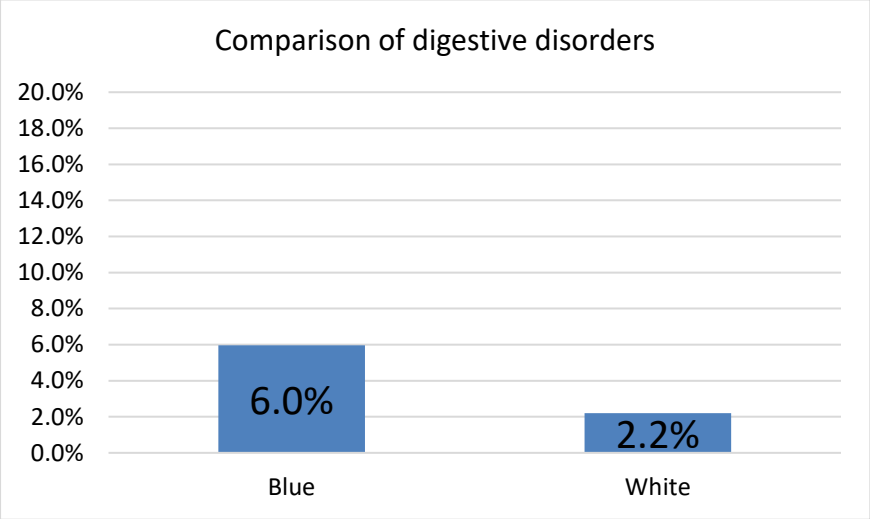
Cancer



Respiratory conditions

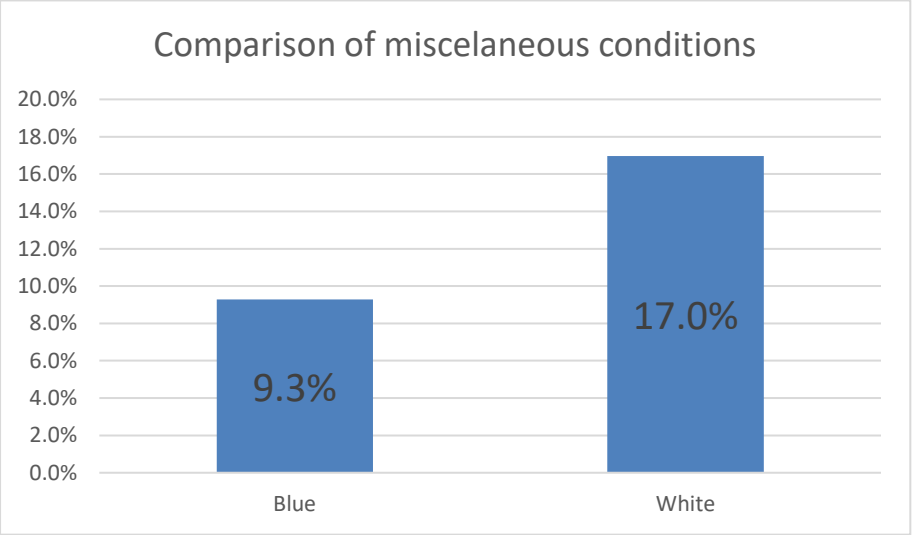


Digestive disorders



Miscellaneous conditions

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



Summary by condition

We summarise the above, although there is 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%
High Blood pressure	26.3%	24.5%	-1.8%
Diabetes	6.7%	6.5%	-0.2%
Cardiac	14.9%	12.5%	-2.4%
Strokes	11.5%	4.8%	-6.7%
Cancer	9.5%	10.2%	0.7%
Respiratory	9.5%	10.2%	0.7%
Digestive	6.0%	2.2%	-3.8%
Neurological	0.4%	0.0%	-0.4%
Miscellaneous	9.3%	17.0%	7.7%

Assessing blue- and white-collar mortality

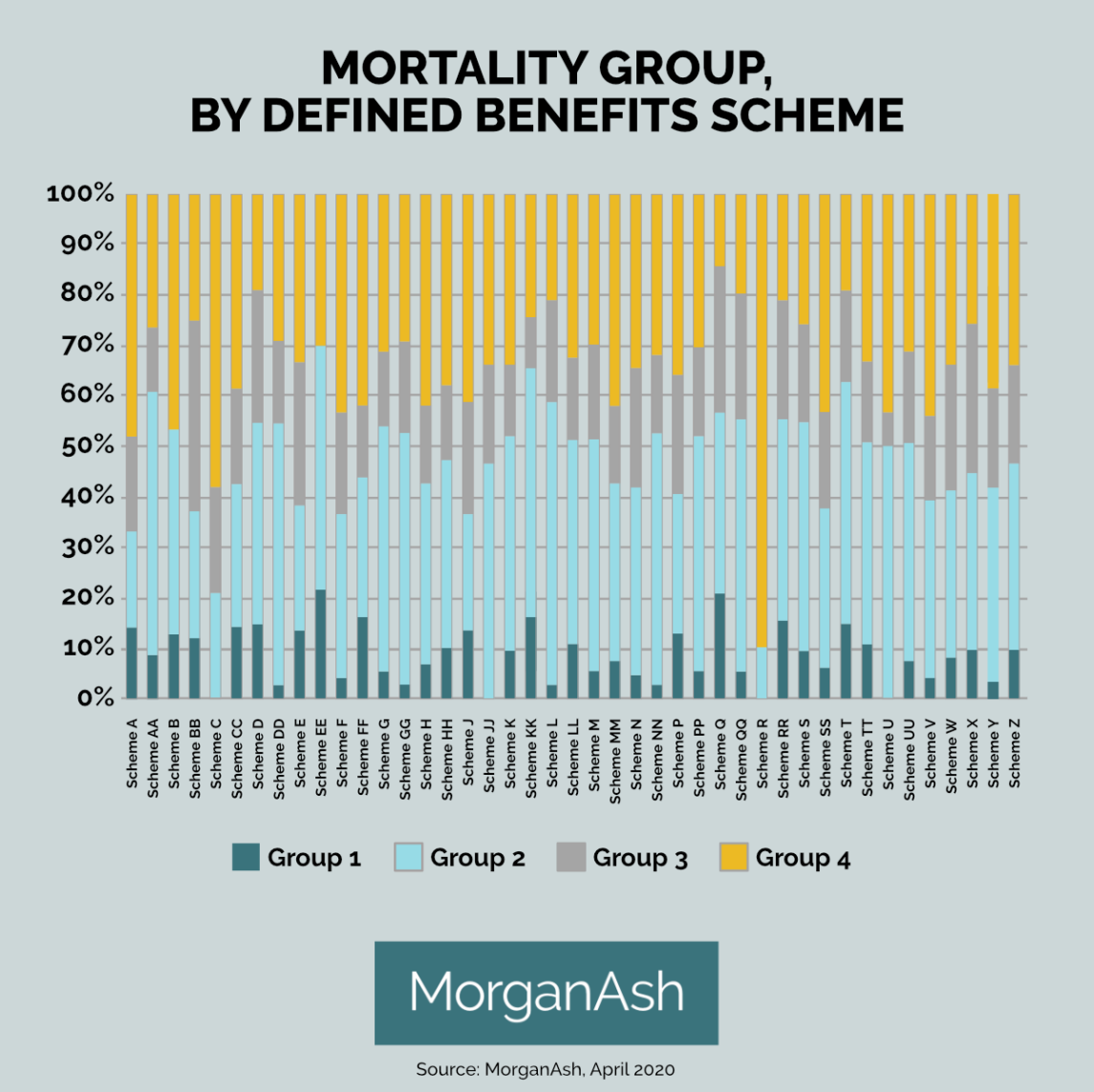
As individuals can have multiple conditions the above health information cannot be summated to get an overall view. What can be summated, as it is based on the individual is the mortality estimate.

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, with 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

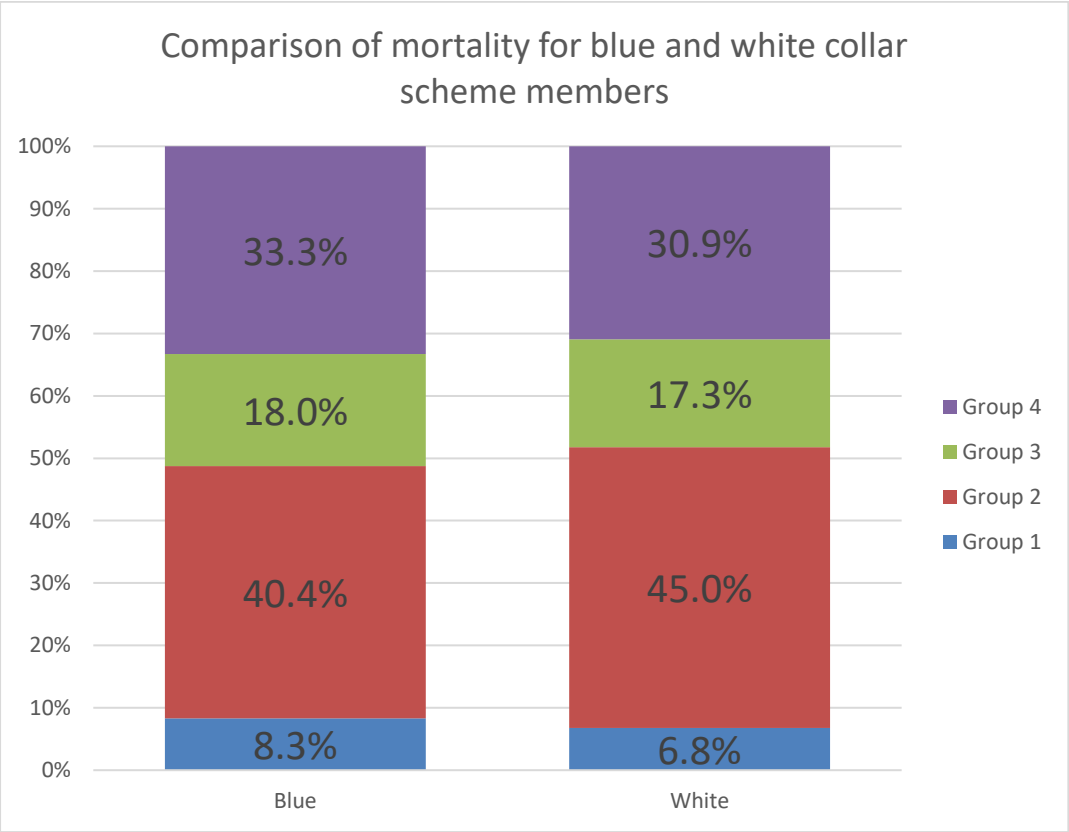
The graph below shows the spread of mortality loadings for the different pension schemes. It can be seen the health and hence the mortality loading varied greatly between individual schemes.



Group 1: Better than average health
Group 2: Average health
Group 3: Slightly below average health
Group 4: Below average health

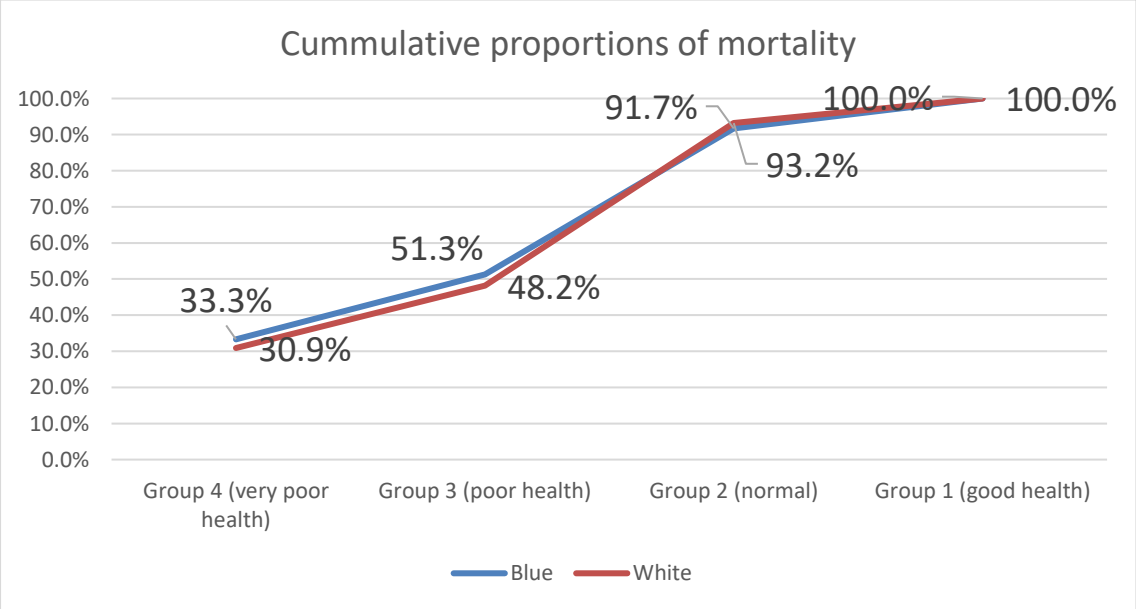
Mortality for blue- and white-collar schemes

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



What is surprising is the similarity of the mortality for the two groups. The blue collar have 2.4% scheme members of very poor health (Group 4) 0.7% more of poor health, 4.6% less of normal health and 1.5% more very healthy scheme members.

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



Regulation

The Pension Regulator (TPR) has been calling for improved evidence when making assumptions in valuations for mortality valuations, for some time. In its recent consultation document (Defined Benefit funding code of practice) TPR requests views on how assumptions are made for assessing mortality for schemes, and notably the option of selecting postcode analysis with assumptions of medically underwritten mortality studies.

It is hoped this paper helps trustee, actuaries and sponsors in the revaluation of these options.

Conclusion

The evidence from comparing the health of white-collar executives and blue-collar workers is 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 very marginal worse health and increased mortality, this difference is small, and importantly as the individual scheme member analysis shows, this does vary between scheme.

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

Trustees and pension scheme sponsors should therefore look to carry out a review of the assumptions made in their scheme's valuation. With the increasing demand for evidence, a solution is to determine scheme members' health to improve the mortality estimate and hence the scheme valuation.