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# BAS Discussion Paper on Mortality

## A response from Lucida plc

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<b>1. Overview</b> .....	<b>2</b>
<b>2. Responses to your specific questions</b> .....	<b>2</b>
2.1 Background.....	2
2.2 Concepts.....	2
2.3 Standards.....	5
2.4 Base mortality .....	6
2.5 Future Changes .....	7
<b>3. Conclusion</b> .....	<b>8</b>

## 1. Overview

Lucida is a specialist insurance company focussed on annuity and longevity risk business. As such, we have an interest in the way in which information on mortality assumptions are communicated to a range of audiences including investors, management, pension scheme trustees and pension scheme sponsors. We therefore welcome the BAS's aim of increasing the transparency of assumptions and improving their comprehensibility to users of actuarial information.

This paper sets out Lucida's response to the invitation to comment on the Actuarial Mortality Assumptions Discussion Paper (the "Paper").

## 2. Responses to your specific questions

This section covers each of the six questions raised in Section 7.1 of the Paper.

### 2.1 Background

Question 1 - Do respondents have any views on the significance of the adverse effects that the over- or underestimation of future mortality may have on pension scheme members, scheme sponsors, life insurance policyholders and life insurance companies, as set out in section 2?

We generally agree with the discussion in Section 2 of the Paper on the significance of the adverse effects that over- or underestimation of future mortality can have on members, sponsors, policyholders and insurance companies.

### 2.2 Concepts

Question 2 - The BAS has discussed some of the issues surrounding mortality assumptions in section 3. In that context:

- a) Do respondents have views on appropriate methods of communicating the extent and impact of the inherent uncertainty involved in mortality assumptions?
- b) Do respondents agree that the use of separate assumptions for base mortality and future changes in mortality, not taking the form of margins in other assumptions, would be desirable?

c) Do respondents have views on appropriate methods of communicating the significance of assumptions, both in absolute terms and relative to that of other assumptions?

We agree that, in order for mortality assumptions to be communicated in a clear and transparent manner, the extent and impact of the inherent uncertainty surrounding them must be explained.

We appreciate that there are a number of methods of communicating this uncertainty and feel that different methods may be appropriate to different circumstances and audiences. Therefore, we do not feel that there should be an Actuarial Standard for communicating uncertainty.

For internal purposes, we generally present sensitivities to the base mortality and future improvements in terms of the percentage change in liability as this clearly shows the financial impact. However, other measures such as life expectancy can be more intuitive depending on the audience. We prefer not to use the equivalent change in discount rate to communicate uncertainty, although can see it may be useful in other scenarios. In particular, we feel this method risks understating the apparent uncertainty as the equivalent change in discount rate is small in absolute terms compared to the change in annuity value. For example, in table B-12, the largest movement is produced by variation 6 which equates to a 14% increase in annuity value or a 1% decrease in discount rate. Additionally, it will not always be clear to what discount rate this 1% reduction should be compared - comparison to bank base rate might be particularly misleading if audiences deduced that mortality trends would exhibit a similar stability to the bank base rate.

We agree that the use of separate assumptions for base mortality and future changes in mortality is desirable and that ideally future changes should not take the form of margins in other assumptions.

Question 3 - Some proposals regarding the use of summary statistics and benchmarks in reporting on mortality assumptions are considered in section 3.

a) Do respondents foresee any practical difficulties in communicating the assumptions about subsequent changes in mortality rates underlying life expectancy statistics?

b) Do respondents have suggestions for summary statistics that can be used to describe changes in mortality rates?

c) Do respondents think that the use of benchmarks is useful, and if so, should the development of standard benchmarks for future changes in mortality be encouraged?

The practical difficulties in communicating the assumptions about future changes in mortality rates often stem from the fact that we are trying to distil a two dimensional table down into a few summary statistics. A schedule of mortality improvements often covers a wide range of ages and time periods.

One problem with the use of life expectancies is that practitioners tend not to state whether they have calculated a complete or curtate life expectancy. Whilst we feel that most would be using a complete life expectancy and that this is the most appropriate, we do not think this was covered in the Paper and feel that it could form part of subsequent guidance.

In general we believe that the use of life expectancies in communicating changes in mortality rates is useful, particularly for less technical audiences. A life expectancy with and without future mortality improvements can demonstrate the strength of those assumptions if presented for a range of ages. However, we also feel that presenting annuity factors or liability figures with and without future mortality improvements can be a good method of demonstrating the financial significance of that assumption.

Other methods that may be appropriate include heat maps, fan charts and average mortality rates in age bands over a number of years. We would not want to prohibit or mandate the use of any particular methods as different methods may be useful in different circumstances.

The discussion of sources of uncertainty is useful. The Paper discusses three main sources of uncertainty, but it might be helpful to discuss the various components of risk within these three sources. These risks are given various names by various commentators so a consistent approach is to be welcomed. It is also clear that the significance of each of these risks to projections varies. Some examples of the risks we have seen discussed are:

- Trend risk;
- Parameter risk other than trend risk. This might include the edge effect mentioned in the Paper but there are a range of parameters in each model and an indication of the most important might be helpful;
- Sample-path risk;
- Stochastic risk – variation around the central expectation but also who dies first with reference to relative pension sizes; and
- Seasonal variation.

We understand the desirability of having standard benchmarks against which to compare but feel that in practice it would be very hard to determine benchmarks which were both realistic and meaningful.

### 2.3 Standards

Question 4 - The BAS would welcome any general comments that respondents may have on the various possibilities for standards set out in section 4. In particular:

- a) Do respondents agree that the BAS should set some standards for mortality assumptions?
- b) Do respondents agree that reporting standards would play a significant role in increasing the transparency of assumptions and their comprehensibility to users of actuarial information?
- c) Do respondents have any comments on how to assess the likely impact of possible BAS standards for mortality assumptions?

We generally believe that standards for mortality assumptions should be principle based and not overly prescriptive. Hence the impact would be difficult to assess.

We feel that it would be quite hard to set standards that cover all the possible uses of mortality assumptions, particularly when we consider the range of products being sold (including impaired life annuities and protection products) and the international reach of many insurance companies.

We do however feel that some standards for disclosing information around mortality assumptions would be useful, particularly given the range of available projections, different methods of application and difficulty in communicating how they have been used. In particular, we would welcome some standard notation and minimum level of disclosure around things like the first year in which a mortality improvement has been applied and improvement floors.

Some guidance around credibility of experience analyses may be useful to some practitioners, in terms of the minimum amount of deaths or exposure that would be required to be 100% credible and possible methods of blending experience with a standard table if a study is not considered to be 100% credible.

## 2.4 Base mortality

Question 5 - In section 5 the BAS considers possible standards for assumptions about base mortality.

a) Do respondents believe that it would be desirable for a BAS standard to require the use the most recent applicable published tables, taking into account both the communication problems and the practicality of setting a limit on the tables to be used?

b) Do respondents have any comments on the proposals for possible requirements for reporting on assumptions about base mortality, criteria that assumptions should meet, or limits that should be observed when setting assumptions? Respondents are asked to focus on:

- any practical problems that might arise in complying with them; and
- whether they would further the BAS's aim of increasing the transparency of assumptions and their comprehensibility to users of actuarial information.

We do not believe that it would be desirable to require that the most recent applicable published tables be used. We note that some practitioners prefer to find the table that provides the best fit to their own data in terms of shape regardless of its age and then adjust this table to an appropriate level. It should be possible to communicate this method to users with particular reference to the more up to date data that has been used. For example, to say that an adjusted "92" Series table has been found to be more appropriate to a specific mortality experience in 2007, say, than a "00" Series table, which will itself have needed adjustment to make it relevant for use in 2007.

In addition, the requirement to use the most up to date table would effectively preclude the use of a table that has be graduated based on the experience of a life office or pension scheme which has enough data to be fully credible. In this case, the use of an office or scheme specific mortality table would be preferable to the use of a standard table. We can also see circumstances where a scheme specific mortality table could be more appropriate to a similar scheme operating in the same industry.

In general, we agree with the suggested criteria in paragraphs 5.51 to 5.55 in the Paper, subject to the level of the minimum volumes and investigation period proposed therein, but remain unconvinced as to the need to make these the subject of Actuarial Standards.

We note that the paper makes no reference to mortality tables produced on either a lives or amounts basis. However, it is interesting that the proposed graduations from the CMI SAPS are

heavily dominated by tables produced on an amounts basis. This could be interpreted as a strong preference within the Profession for tables produced on an amounts basis. In contrast, there are more tables in the “00” Series on a lives basis than an amounts basis. Use of amounts or lives basis should certainly be disclosed and guidance on circumstances in which tables on an amounts basis and on a lives basis are appropriate might be helpful to some practitioners.

## 2.5 Future Changes

Question 6 - In section 6 the BAS considers possible standards for assumptions about future changes in mortality.

a) Do respondents agree there is no objective basis for differentiating the future changes in mortality likely to be experienced by a particular small group of lives from those likely to be experienced by the population as a whole? If respondents disagree, the BAS would be interested in examples to the contrary, together with supporting evidence.

b) Do respondents have any comments on the proposals for possible requirements for reporting on assumptions about future changes in mortality, criteria that assumptions should meet, or limits that should be observed when setting assumptions? Respondents are asked to focus on:

- any practical problems that might arise in complying with them; and
- whether they would further the BAS's aim of increasing the transparency of assumptions and their comprehensibility to users of actuarial information.

Currently, we do not differentiate the rates of mortality improvement for small groups of lives compared to the population as a whole (although we do differentiate between males and females). However, we feel that making this a standard could close down that area of research in the future. It is possible that future studies could provide sufficient evidence to differentiate between different groups. Examples could be different socioeconomic groups, different smoking statuses and individuals qualifying for impaired life annuities. At some point in the future, there may be evidence to suggest that CMI Assured Lives, CMI Pensioners and Annuitants and CMI SAPS pensioners have exhibited different rates of improvement and that this is appropriate to project into the future, possibly for a limited period of time.

We feel it is harder to set criteria for future changes because, for example:

- there are situations where future changes may not need to be differentiated between the sexes, for example, the same strong assumptions may be deemed prudent for both sexes;
- there are some countries whose mortality improvements have not displayed the cohort effect;
- it is difficult to determine plausible relationships between the assumptions at various ages; and
- it is difficult to verify smooth progression from historic rates of change because it takes a while for these to be reported and rates of improvements can be volatile year on year and at individual ages.

### **3. Conclusion**

In conclusion, although we welcome the aim of increasing transparency of assumptions and improving their comprehensibility, we question how much of the Paper should form Actuarial Standards and whether the BAS's aims could be better achieved through guidance on good practice.

Except in the narrow area of disclosure of assumptions, we generally take the view that standards should be principle based and not overly prescriptive, since prescriptive standards can inhibit innovation and foster both complacency and a “box-ticking” approach.

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