

## BAS Discussion Paper on Actuarial Mortality Assumptions

Recommending mortality assumptions is an important aspect of actuarial work. Life offices have given significant thought to these assumptions and the introduction of pillar 2 reporting requirements has further increased the focus on both central assumptions and on the range of potential outcomes. The paper from the BAS is both topical and relevant. We welcome the opportunity to comment on this paper and hope the comments we make are helpful.

We are confident that the principles we apply to our internal communication of mortality assumptions are already in line with what the BAS would like to see.

We agree that the specification of limits on assumptions is difficult territory, especially where particular assumptions are appropriate for certain situations but may not fit a global standard. It is important that assumptions are appropriate to the situation under consideration. Nevertheless, we believe there could be a role for the BAS in highlighting what constitute “more extreme than normal” longevity assumptions and in setting disclosure requirements relating to these.

In summary, we believe that any standards set by the BAS should be helpful in enabling firms to identify which assumptions might be considered more extreme, and to require more disclosure in explaining the choice of such assumptions, but not to prescribe assumptions to use.

*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 would agree with the general premise that making inappropriate assumptions about future mortality rates could lead to inappropriate decision making.

We think it would be clearer if this “background” section drew out some of the issues with predicting the base level of mortality. For example:

- There may be a lack of credible experience data (in general or at particular ages etc).
- Experience data and population data may be out of date.
- Experience data may not be relevant for recently issued business (e.g. for insurance business there could have been changes in marketing strategy, underwriting practice or the introduction of new rating factors. For annuities, growth of the impaired/enhanced annuity markets and the changes in the proportion of business generated in the open market may also have an influence).

As a consequence of the above comments we believe that section 2.19 should refer to “future mortality” rather than “future improvements in mortality”.

*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?*

Our preferred approach is to use scenarios and explain the impact on key financial metrics such as profitability, solvency or funding rates. Expectations of life and annuity values in different scenarios are also useful tools for communicating uncertainty. Over-reliance on

statistical models and methods that involve projection of past trends can create the situation where users of actuarial reports spend a disproportionate amount of time trying to understand the modelling approach rather than understanding the underlying longevity risk.

The suggestion in 3.19 of explaining uncertainty in mortality in terms of an adjustment to a discount rate appears more complicated than explaining the financial impact directly.

Too much detail, in the sense of breaking down uncertainty into the sources detailed in 3.11 to 3.15 (modelling error, parameter error, random variation, data error, error due to expert judgment) is unlikely to be helpful for some audiences and for less material risks. Our preferred approach is to use simpler models where possible and consider a range of scenarios that encompass the risks in 3.11 to 3.15.

In 3.23, the paper suggests that, in theory, the level of past mortality is a fact. In practice, the key issue is that there is a significant degree of uncertainty surrounding the choice of base mortality assumptions, as highlighted in 3.24 and 5.36.

*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?*

We agree that the use of separate assumptions for base mortality and future changes is preferable as it helps with the explanation of overall assumptions. However, we do not think that a prudent basis needs to include explicit margins in both base mortality and future changes.

*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?*

As mentioned in 2) our preferred approach to communicating mortality risks is to use scenarios (both reasonably foreseeable, e.g. for Financial Condition Report and planning purposes, and more extreme, e.g. for capital allocation purposes) and explain the impact on key financial metrics such as profitability, solvency or funding rates. We would expect this approach to be adopted for other assumptions in conjunction with a stochastic approach for risks that can sensibly be modelled in this way (e.g. investment risk).

*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?*

Cohort expectation of life figures in conjunction with portfolio level financial metrics are useful summary statistics that give an easily-understood picture of mortality assumptions. They do not however convey the underlying information about future changes in mortality rates. An aid to explaining complicated 2-dimensional mortality rate changes would be to calculate a single rate of change that gives financial equivalence.

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

We suggest a combination of portfolio level financial metrics, expectations of life and annuity value information (the latter as a measure of the financial impact of different assumptions, as it allows for the effect of discounting). The portfolio level financial metrics we use to

illustrate the significance of longevity risk include the impact on earnings of strengthening reserves and the impact on Individual Capital Assessment requirements.

*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 label “benchmark” may give an unwarranted degree of credibility to a projection. In particular, projections that rely solely on the extrapolation of past data may be inappropriate. The situation described in section 3.60 of developing benchmarks by considering scenarios (e.g. heart disease halving in 10 years) has potential but would require consistency in base scenarios (e.g. what is taken as the current level of heart disease). Developing and maintaining benchmarks that are reasonable is potentially onerous. The use of benchmarks would also require consistency in the way in which they are presented and interpreted to ensure that they are not applied differently.

*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?*

We agree in principle that there should be standards highlighting what actuaries should take into account when recommending mortality assumptions. We do not believe that these should limit the valid discretion that it is appropriate to exercise in certain situations. We are not in favour of the prescription of mortality assumptions, rather in the setting of minimum standards in terms of the approach used. As mentioned in our comments at the start of this document, we see that there could be a role for the BAS in identifying “outlier” assumptions, the use of which should require justification by the person or persons recommending them.

*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?*

It would be useful to have a reporting standard covering how to describe the assumptions that have been chosen (i.e. a naming convention) to provide some consistency between firms and to help comparisons between bases used by different firms. If an unpublished table is used the standard could then require full disclosure (i.e. of an amount sufficient to be able to generate the mortality rates used).

Required statements about analyses performed may be useful but explanations may turn out to be over-simplified for the sake of brevity. The same applies to required statements about supporting evidence and uncertainty.

It would be sensible to require qualitative statements about the degree of prudence in assumptions, but it may be difficult to achieve consistency between companies in terms of how they calculate the degree of prudence.

In section 4.20, it mentions that one consideration is to require assumptions to be justified on the basis of evidence. Any standards in this area would need to be flexible enough to cover situations where assumptions are based on judgements applied to data from other sources including situations where the past is not viewed as a reliable guide to the future. For example mortality improvement (or worsening) assumptions may be based on the views of medical experts – we assume that in such cases, it would be sufficient to note that medical expert opinion had been sought without having to delve deeper into the justification for their

opinions. In some cases, life offices may set mortality assumptions based on rates supplied by reinsurers. In such cases, it may be more difficult to show evidence for the basis.

The idea of setting limits for assumptions does not appear practical and could potentially restrict the degree of prudence applied to certain situations. It would seem very difficult to determine limits that were appropriate in all situations.

*c) Do respondents have any comments on how to assess the likely impact of possible BAS standards for mortality assumptions?*

A general comment would be that to avoid unnecessary overheads, standards should reflect the materiality of assumptions.

Does this section imply that the BAS foresee significant changes to existing practices?

*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 of 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?*

We don't believe it would be desirable to require the use of the most recently published tables. It's possible that the most recent tables do not provide the best fit to mortality experienced by an office/pension scheme and that the use of older tables with adjustments is more suitable. We do not believe that communication of this is any more problematic than the general communication of the basis used.

In addition to this, it may not always be desirable to use published tables at all, or at least not without significant modification. For example, for assurances, select effects should depend on underwriting standards.

*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.*

Under section 5.42, we note that for statutory valuations, the proposed reporting requirements are already in place under FSA rules.

The amount of information that might be required could lead to more confusion rather than a better understanding of mortality bases. It seems likely that some of the information (e.g. methods of graduation) will only be easily understood by other mortality practitioners. While this might lead to more standard practices amongst the industry, it could also remove some competitive advantages.

Section 5.51 states that base mortality should generally exhibit a smooth progression between ages. We note that this may not always be the case – for example, where the table covers retirals and earlier ages cover ill-health retirals while later ages cover normal retirals.

In section 5.52, it is suggested that any adjustments made to published tables should be on the basis of evidence. It's possible that some adjustments may be made given, for example, population evidence that has not appeared in an office's data but is used to give a more prudent basis. We hope this practice would not be precluded. Similarly, there may be

situations where a company does not have sufficient evidence of its own (e.g. a start-up company or for an innovative new product) and has to make some reasonable estimations of mortality.

We agree with the statement in 5.56 that limits on mortality assumptions would have to be so broad as to have no practical effect. We do not agree with the implication in section 5.57 that valid published tables always exist. For example an office writing impaired life annuities might develop its own tables reflecting the nature of the initial impairment. Similarly a product could be designed that provided an accidental death benefit and existing standard tables would be largely irrelevant for the purposes of valuing or pricing such a product.

*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.*

We believe this proposal directly contradicts the proposals in section 6.60 and 6.61 to differentiate by age, year of birth and sex. We believe there is an objective basis for this differentiation (medical advances will affect different age groups and cohorts of males and females differently). Future changes may also affect different socio-economic groups differently and at different times (consider reductions in smoking prevalence where affluent socio-economic groups have responded to education and other groups have responded to regulation and taxation). Lives suffering from particular impairments may also see a different pattern of changes from the general population.

We question why “small groups of lives” are distinguished here – if a difference for any group can be shown to be significant then this is an objective basis.

*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.*

We agree summary statistics are useful and the proposal to separate the impact of base assumptions and future changes in mortality is desirable. We also agree it would be appropriate to provide a statement in reporting on the context of the assumptions, for example, whether bases used are prudent or best estimate.

Criteria requiring differentiation between genders could cause issues if there is a lack of data (for example, male reversionary annuitants). This could also be the case for older ages.

In section 6.62, it is suggested that future changes in mortality should generally exhibit a smooth progression between calendar years for the same age. This may not be the case where strong cohort effects are present. It seems unnecessarily detail to have to explain any cases where rates are not smooth.

Section 6.66 discusses limits relating to prudent assumptions. We suggest that it would be preferable for the BAS standards to highlight assumptions that they consider clearly imprudent in certain situations rather than to limit what constitutes a prudent assumption. The

example given, of requiring allowance for future improvements for a certain period, may not bear out what is expected in practice and any such limits would need to be reviewed regularly in light of emerging new information.

There could be practical problems in requiring firms to use 2-dimensional mortality tables for some types of business valued using older systems that are not able to cope with such tables. The same applies to any requirement to have separate assumptions for males and females.

*In addition to the specific questions listed above, the BAS invites respondents' views on any other aspects of possible standards for mortality assumptions in actuarial calculations. To ensure that the significance of their point is fully appreciated by the BAS, respondents are encouraged to indicate how their comments address the BAS's aim of increasing the transparency of assumptions and their comprehensibility to users of actuarial information.*

Please see our comments at the start of this document.

David Hare  
Chief Actuary, UK & Europe  
Standard Life Assurance Ltd  
June 2008