**DATA FOR SOCIAL SECURITY VALUATIONS**

**ABSTRACT**

Actuaries working on valuations of social security arrangements often face problems with the availability and quality of suitable data. Such problems can be particularly acute for actuaries working on valuations on a consultancy basis as opposed to as permanent employees of an arrangement. This paper set out considerations in specifying and validating the data required for the valuation of a typical social security arrangement, and presents processes for checking the quality of the data. It also gives a data template that may be a useful guide. It may be useful for actuaries to share this paper with their social security arrangement colleagues and clients to help all parties in understanding what kind of data are needed and why.

**PRINCIPLES**

1. The International Actuarial Association guidance “Financial analysis of social security programs” (ISAP2) requires that an actuary producing a financial analysis of a social security system “should state the extent to which the following hold, or do not hold: the data upon which the report is based are sufficient and reliable”. Data which are not sufficient or reliable would undermine the value of the analysis being performed.
2. [Material to be drafted based on UK and US professional guidance]
3. [Need to mention materiality/proportionality here as well, I think]
4. Both pieces of guidance point to the need to ensure that the data used in social security work are as
* **sufficient** and
* **reliable**

as possible [and mention materiality as well].

**DISCUSSION**

1. Data for the valuation of social security arrangements often cause considerable problems. Specification and checking of data often consume large amounts of time and money, which can delay the results of the valuation and lead to extra costs in its production. Late reporting of results may undermine their usefulness and high costs may mean that less actuarial resource is used in other aspects of the management of the arrangement, leading to sub-optimal outcomes.
2. It is most unlikely that any data set will ever be 100% reliable. And it can be hard to get a dataset that is sufficient for building and testing financial projection models. This note gives considerations towards increasing the reliability and sufficiency of data received from clients for the purposes of financial projections.
3. Given the wide variety of social security arrangements, in terms of size, level of sophistication of administrative systems, nature of benefits, the variety of different type of financial analysis that an actuary may be asked to undertake and other factors, it is not possible to develop a “one-size fits all” approach to obtaining the data for social security work. This also tends to preclude any mechanical setting of standards and standard forms for data from clients, especially when the actuary is working as a consultant on a one-off project.
4. However, actuaries can work to improve the quality of data provided: for instance, it may be possible to share with parts of this note with those providing the data, better to explain the data we need and the checks that an actuary will perform on them.
5. Actuaries who work in-house within organisations operating social security arrangements, or in similar situations should have the opportunity to influence the data that to be provided for financial analyses over the long term. This may well include helping to specify the data items that will be recorded in the main administrative databases (including items that are of greater use in actuarial analysis exercises than in administration) and in the design of regular management information reports. However, even in these situations it may be hard for the actuary to obtain the exact information required due to inflexibilities in the database or management information systems or other cost constraints.
6. Actuaries who are called on to undertake financial analysis of a social security arrangement on a one-off or other irregular basis as a consultant will almost certainly need to specify data extracts from a database into the design of which they have had no input. Data items which may be considered important may well be unavailable. In addition, aspects of the design of the administrative database and related management information systems may make it hard to obtain the extracts of summaries of data which would be most helpful for the actuary’s financial analysis.

**Structure of this paper**

1. This note covers in detail membership data, including those on amounts of pensions and similar financial information. It does not cover in detail high level financial information as may be found in the accounts of an arrangement, though the use of such information is touched upon.
2. The main part of this note, covering membership data, has two parts
* **Sufficiency**: considerations regarding what data we should request to perform a projection of the finances of a social security arrangement, based on uses of data as described by the International Actuarial Association’s international actuarial practice note on social security.
* **Reliability**: considerations regarding how data should be checked.
1. Appendix A sets out high level financial and other information that are likely to be required for work involving projections of the finances of a social security arrangement.

**SUFFICIENCY – WHAT DATA DO WE NEED**

1. The International Actuarial Association’s ISAP2 (“Financial analysis of social security programs”) mentions two main areas in which data are used for the purposes of the financial projections of social security arrangements:

(a) the **starting point** **of the projection** period;

(b) the assumptions used for the financial projections **based on an analysis of past experience**.[[1]](#footnote-1)

1. The major drivers of the type of data required for a valuation or review fall under items (a) and (b) in paragraph 14. Data may well also be used for validation of the projection methodology (this was explicitly mentioned in the previous version of IAA guidance on social security work), and this may require more data, but is perhaps unlikely to require different types of data. Hence the next part of the note will be based mainly around the two questions of “what data do we need as a starting point of the projection” and “what data do we need to analyse past experience to determine suitable assumptions”.
2. Social security valuations tend to involve projections of cashflows, both future benefit outgo and future contribution income. So the data will need to reflect this, both in respect of the starting point of the projection (so need allowance for projection of future contribution income as well as benefit outgo) and in terms of data for analysis of experience (in terms of needing to derive assumptions for projection of both future contribution income and benefit outgo).
3. The UK standard, TAS M, as well as the “GAD principles for actuarial quality” requires that all data be documented, as does, to an extent, the IAA generic standard ISAP1 “General actuarial practice”, though the social security standard doesn’t make specific reference to this.

**Data as a starting point for the projection**

1. The key issue here is that the data represent the totality of the arrangement’s liabilities. There are two issues here:
* **Have all material elements of the arrangement’s liabilities been identified**? Have all the terms and conditions which may give rise to people getting benefits in future (or continuing to receive benefits they do currently) been identified? It’s necessary, of course, to start with the legislation or rules that govern the arrangement – though it is also necessary to understand any extra-statutory terms and conditions, or how discretion is and will be used in practice.
* **Do the data provided accurately reflect the numbers of people and amounts of benefits that form the liabilities of the arrangement as previously identified?** This is covered in the second section of this note, on checking the data.
1. However, once all the elements that may give rise to liabilities have been identified, it may be useful to evaluate whether all are **material** for the task at hand. In many cases materiality can’t be evaluated until the relevant data have been obtained and analysed, but in some cases lack of materiality can be ascertained at a very early stage, with consequential simplification of data requirements. Materiality may be particularly hard to assess in terms of producing cashflows: some elements of scheme liabilities may be immaterial as capital values of liabilities are concerned, but give rise to cashflows that are material in certain periods of the projection. [? Extend this discussion to ask whether different cashflows in certain years but which have the same overall discounted value are ever likely to be material to any decisions?]

***Data as a starting point for the projection – effective date issues***

1. The data need to be as at the **valuation date**. Note that there can be problems here in that some social security arrangements may operate databases which cannot “go back in time” to show the situation as at the valuation date when data are requested and extracted at a date somewhat after the valuation date. If the actuarial appointment is in place well before the valuation date, this problem may be anticipated by making the data request in advance of the actual valuation date.
2. In addition, there can be problems about **late postings** of data to the administrative database so that it never captures all the information relevant to the calculation of benefits as at the valuation date, or so that to capture full data as at the valuation date would require waiting so long after the valuation date that the resulting analysis would be useless.
3. Where these two problems affect the data, it is likely that actuarial judgement will be needed to adjust the data so as to be complete and “as at” the valuation date, with suitable recording of adjustments in the valuation report and suitable adjustment to the opinion discussed in paragraph 7.
4. A particular problem can occur when seeking data by individual age. It can be the case that the only age definition possible is age as at the date of extract, rather than age at the effective date of the valuation (or age at date of movement for analysis of experience as covered in the next section).
5. One neat solution to this is to ask for all data to be **classified by year of birth** rather than age as at any particular date. Data by year of birth can easily be turned back into data by age as at any given date, and problems of ambiguity as to which date the data are “as at” disappear. In addition, problems arising from treatment of members with unknown dates of birth should be easy to spot with this approach, as all such members should be identified clearly under such an approach, rather than allocated (sometimes by unclear processes) to particular ages as can happen under a “data by age” approach.

***Data as a starting point for the projection – individual vs grouped data***

1. The data required as a starting point for a projection are either:
* a **database**: a listing of all members with rights to benefits either now or in the future, together with information on the amount of those benefits or that will be used for the calculation of those benefits, plus demographic information about each member (sex, age/date of birth, possibly marital status and children) – essentially the full administration database, or, perhaps more likely, an extract from it; or,
* **grouped data**: tabulations giving the totals or averages of the benefits or of information that determines how benefits will be calculated for each unique demographic group, generally by sex and age (for cases where a database cannot be produced, or would be too big to be sent or to manipulate). Information on numbers of people (“**lives**”) may be relevant as well, but it is information on **amounts** that is really important.
1. It may be possible in a large scheme to use a database that is a sample of all records in the full administrative database. The sample size will need to be chosen such that the resulting database is not so large that it cannot be manipulated, and not too small so that the resulting data are not credible when used for analysis of experience (see paragraph 40).
2. Great care will be needed where a database (or sample database) is used to provide data that are the starting point for projections to avoid issues around the database not being complete – see discussion in paragraph 53).
3. Even where it is possible for the client to provide a database or database extract, it may be necessary to model using grouped data, with the the database queries to produce the grouped data ourselves performed in-house by actuarial team.
4. When using the second approach it would be useful to bear in mind the requirement in TAS M (section 4.9) that grouped data are identified, the reasons for the grouping and the criteria used to determine the groups are documented, and, in reporting the results, an explanation be given of the rationale underlying the grouping (unless it is possible to demonstrate that the grouping has no material effect).
5. Grouping data or using aggregated data should have no effect where there are:
* no limits (upper or lower) on the amount of a benefit for an individual that will be applied in future
* no question of guarantees, options or other terms which may affect some members of the group but not others.

For this reason, it MAY be possible to group pensions-in-payment by age and sex; although there may have been maxima or minima or guarantees or options applied in calculating the pensions when first awarded, there will probably not be any applied in future. However, if pensions in payment are subject to some minimum rate that is liable to be altered other than in line with alterations to the general rates of pension, grouping may have a material effect. Similarly, amounts of deferred pensions could be grouped entirely safely only if on conversion to pensions they are NOT subject to any maxima or minima or, for instance, guarantees based on contributions paid.

***Data as a starting point for the projection – other issues***

1. There may be problems obtaining data from a membership database in respect of certain guarantees, options and the like. Though the database should include all the necessary information for processing such options and guarantees, the administrators of the arrangement may rely on off-database information. Consideration needs to be given as to the materiality of such matters if it is likely to be complicated to obtain full data on them.
2. Some measures useful for the basis of fund projections, such as accumulated contributions to date, may be hard to obtain if the scheme administration database holds for each individual only the contributions paid in each past period, with calculation of the total accumulated contributions being performed only when a claim is made.
3. When considering accrued contributions as a unit of analysis, care may well be needed to distinguish between long-serving low earners and high-earning people with short service, as such people may well have different characteristics.
4. An example is given in appendix B.

**Data for analysis of past experience**

1. To conduct an analysis of any particular material item of experience we need two types of data, on
* The **number of movements** (retirements, deaths, awards of benefit, early exits and so on)
* The **exposed-to-risk** for each kind of movement

These need to be consistent (this note is not a basic life contingencies course, so it is assumed that readers are familiar with these concepts).

1. Strictly we need to investigate all possible movements in the multiple state model that defines the arrangement. Study of the legislation governing the arrangement similar to that suggested in paragraph 15 will be necessary to understand the multiple state model that defines it. Often several different movements will be out of one state and have one exposed to risk measure as a denominator (but dependency of decrements will need to be considered in any calculation).
2. Some movements may be immaterial: it may be possible to identify this at the outset and thereby reduce the data request by not seeking data on these, while others may turn out to be immaterial only after data have been obtained.

***Data for analysis of past experience – exposed-to-risk***

1. What we need generally are the numbers of person-years in a defined demographic group (age, sex, perhaps membership category) over a given time period, regardless of what has happened to the individuals comprising those person-years subsequently.

Example: if we’re seeking to measure the ill-health retirement rate among men in active employment aged 47 last birthday in 2009-10, we need to know how many years (or, more accurately, parts of years) were spent by all men aged between 47 exact and 48 exact in the relevant time period, regardless if whether such people actually did retire on ill-health grounds in 2009-10, or left on other grounds in that period, or retired or left on other grounds in subsequent years up the valuation date or the date of extract of data.

This can be fiendishly difficult for all but the most sophisticated administrative database to calculate, and even if it’s theoretically possible for the database to calculate, it may be practically impossible if the database administrator cannot write the necessary programs or does not understand the request. This is related to the issue covered for data as a starting point for the projection in paragraph 16.

1. A common approximation is to consider that the exposed-to-risk in a period can be calculated as the average of the “snap shot” populations as at the start and end of the period. This has an advantage that the “snap shot” population is very similar, often identical, to the format of data required for the start of the projection (where the data required is a “snap shot” as at the valuation date). Care is needed if it is thought that there are likely to have been any discontinuities in membership over the period – for instance a sudden influx or outflow of members. And note, of course, that the approximate exposed-to-risk under this method of men aged 47 last birthday in 2009-10 is not the average of those aged 47 last birthday in 2009 and those aged 47 last birthday in 2010: rather it is the average of those aged 47 last birthday in 2009, those aged 46 last birthday in 2009, those aged 47 last birthday in 2010 and those aged 48 last birthday in 2010.
2. A full analysis of experience would require exposeds-to-risk and numbers of movements for each year of the inter-valuation period. This may not be possible or sensible in all cases. Where using the approximation described in paragraph 31, the “snap shot” populations will be required at the start of the inter-valuation period, the end of the inter-valuation period (the effective date), and at each year end in between where it is sensible to investigate the experience year by year.

***Data for analysis of past experience – number of movements***

1. As with the exposed to risk, accessing this information can be difficult as it requires an administration system to “go back in time” to identify all movements in a period regardless of what happened subsequently to the individuals involved. For instance, we may need to know the number of all ill-health retirements in 2009-10 we need the total number of such retirements, NOT just the number of ill health pensioners as at the effective date (or, worse still, as at the date of the data extract) who retired in 2009-10 aged 47, as this measure would exclude ill-health retirements in 2009-10 who subsequently died.
2. It would not be consistent to derive a movement rate by dividing a number of movements from a population during a year who had subsequently survived to the effective date/date of data extract by an exposed to risk made up of those in the relevant population during an earlier year who had survived to the effective date/date of data extract: the survival rates would be different.
3. Movements that are not associated with payments of benefits or cessation of payment of benefit (for instance, death of a non-pensioner without dependents) may not be captured or recorded on an administrative database, or may not be captured or recorded fully or accurately or in a timely manner.

***Data for analysis of past experience – credibility***

1. An analysis of experience that leads to rates of movements calculated by individual ages (and then smoothed for use) will be possible only for the largest arrangements with top quality data. In other cases, even if the right data exist to allow the calculation of such rates at all, the volume of (reliable) data will be insufficient for the data for to be credible in a statistical sense. Issues of credibility of data will occur even in cases where factors in the arrangement are material, unfortunately. The lack of credibility of data will occur in analyses of even the largest social security arrangements if the small enough units of analysis are chosen (individual ages, small geographical regions, different categories of members, or employees with different earnings levels).
2. In some cases data from one part of the arrangement may be fully credible, while data from another part may not, for instance for pensioners in a recently established arrangement.
3. Various options exist where data are not credible but where rates still need to be calculated for materiality or other reasons. An option should be sought that is consistent with the availability of data, the size of the arrangement or part of the arrangement under consideration, the reliability of the data (these last two points taken together determine statistical credibility), the materiality of the assumption and the budget and the desires of the client. In descending order of sophistication options include:
* full analysis using data as set out in paragraphs 30 to 35
* comparison of numbers of movements by individual age/sex cell with those derived by multiplying the exposeds-to-risk on those cells, as calculated using from data as described in paragraphs 30 to 32, with some externally-derived rate of movement, perhaps from a previous valuation, or a rate used for the valuation of a larger arrangement, or an arrangement in a larger territory, with a view to applying a loading to the externally-derived rate that varies by age/sex
* as above, but in grouped ages
* as above, but for all ages combined, (and possibly across sexes or at least across other categories)
* use of entirely externally-derived rates of movement.

***Data for analysis of past experience – amounts vs lives***

1. An analysis of experience may well want to distinguish between rates for movements between states **by lives** and **rates by amounts**. This may be particularly relevant where different socio-economic groups within the same arrangement have very different characteristics (not just in relation to post-retirement mortality but also possibly in relation to ill health or other retirement). An analysis of experience by amounts will be more appropriate where the basic unit used in modelling the arrangement is amounts of pensions or contributions accrued.
2. In a model that is based around individuals, it may well be necessary to capture such effects by differential movement rates for those with different levels of earnings/contributions/pensions. This in turn implies a more sophisticated analysis of experience with data for the exposed-to-risk and the numbers of movements split by level of earnings/ contributions/ pensions – this is unlikely to be possible unless both the data are particularly extensive and good and easily manipulated, and the budget for the project is large. It would only be suitable as an approach for a material assumption.

***Data for analysis of past experience – general***

1. The issues around age definition identified in paragraph 19 apply also to data for analysis of past experience. As noted in paragraph 30, the problems mentioned in paragraph 16 with databases that cannot “go back in time” are even more relevant for data for analysis of experience than for data as a starting point for the projection.
2. An example is given in appendix B.

**Data for validation of projection methodology**

1. As noted in paragraph , the data needed to do this will often just be a variant of the data needed as a starting point for the projection. For instance, one method to validate the projection methodology would be to run a projection starting from one or two years before the effective date of the valuation and seeing if the status of the arrangement (in terms of variables such as number of members in different categories, levels of assets of the arrangement) at the effective date were in line with reality. Of course the results will never be exactly in line, as the model will make some assumptions which are not in line with reality in the years covered: a key question will be the extent to which the assumptions to be used for the projection beyond the effective date are over-written in the test run by actual values (as this is not guidance on modelling, there will be no further discussion on this issue).
2. To do this, the additional data needed would the same data as required for the start of the projection, but as at a date one or two years before the effective date. This can be difficult, of course, for a relatively new arrangement, impossible for an absolutely new one. And issues in cases where administrative databases cannot “go back in time” as discussed in paragraph 16 can make this even more difficult.

**What data do we need – summary of how we can specify the data**

1. The key steps are
* Understand the arrangement – in particular
* what gives rise to the liabilities
* how the arrangement can be modelled as a multiple-state model, and therefore what are the
	+ “states” that give rise to “exposeds-to-risk”
	+ “movements” between states
* Set sensible materiality limits for the work (in consultation with the client) and try to anticipate what aspects of the arrangement can be subject to simplified or no modelling as they will be immaterial
* Engage with the client on data issues early, in particular to
* anticipate problems that may arise due to difficulties in extracting data as at past dates from the administrative database (“going back in time”)
* Decide on whether to seek the entire database or a substantive extract therefrom, or grouped data
* if the latter, understand the limitations imposed
* Make an assessment of likely data credibility based on the size of the arrangement or the part of it under consideration and likely reliability of data, and decide how that will affect data to be sought for analysis of experience

**RELIABILITY – DO THE DATA REFLECT THE ARRANGEMENT’S LIBILITIES**

1. The data with which the actuary is provided need to reflect the liability of the arrangements fully and accurately. This is absolutely crucial for data used as a starting point of the projection (and, by corollary, for data used to test the validity of the projection methodology). It is also very important for data used to analysis the experience of the arrangement: the danger there is that inaccuracy or lack of completeness in data on either the exposed to risk measure or the “number of movements” measure will lead to biased estimates of transition probabilities.
2. The data received from scheme administrators for use in the valuation needs to be tested for :
* **completeness** – does it accurately and fully reflect the scheme’s liabilities, as touched on in paragraph (as stressed in paragraph 47, this is particularly vital for data used as the starting point for the projections);
* **internal consistency** (this is particularly important for data used in the analysis of experience, where consistency between the exposed to risk and “number of movements” has been highlighted in paragraph );
* **consistency with other data sources** (where possible) – this should include a reconciliation with the data used for any previous valuation of the arrangement
* **commonsense** checks.
1. Even where data are provided from a system with which the actuary has worked for some time, checks are still needed as the problems may have occurred with data that have been entered or changed since the last extract, or where some other change to the database or management information system has affected the reliability of the data provided.

**Completeness**

1. We are generally not well placed to determine whether data we have been given achieve the completeness point in paragraph , which is crucial to the accuracy of the result of the valuation or other calculations we are performing. There are many reasons why the data may not capture all the liabilities. The key reason is that the data are produced from a database of members that is not complete or fully up-to-date. This in turn can arise from a variety of reasons such as late posting (as mentioned in paragraph ) and other delays in up-dating information, the database not being able to hold details of “unusual” cases and other inaccuracies in the data.
2. The usual method of assuring ourselves that the data for the starting point of the projection are complete is to compare the data we have been given with figures in the audited accounts of the arrangement. The auditors should carry out checks on the data systems as well as on the records of actual transactions as part of their professional responsibilities in signing off the accounts. However, there are two problems with this approach:
* the auditor’s responsibilities are limited to the numbers and amounts shown in the accounts – these will represent payments or receipts during a year, and not the stock of liabilities at the valuation date – and therefore the audit may not cover whether the database holds all records of rights to benefits in future (as opposed to rights to benefits now)
* The auditor may make no comment on any discrepancies between data from the database of members (which may or may not have been examined in any audit) and the financial amounts held in a ledger/database of financial transactions.

Despite these problems, reliance in some way on the audited accounts is generally essential to the valuation or other calculations.

1. A typical approach, therefore, is to:
2. Request data from the database of members on the stocks of liabilities as at the valuation date
3. Request data from the database of members as to transactions which will result in benefits and payments during the year
4. Compare data from the database of members as to transactions which will result in benefits and payments during the year with information from the audited accounts on benefits and payments in the year
5. Derive a rating up factor from the the comparison at iii) and apply it to the data at i) to give figures for the stocks of liabilities consistent with the amounts in the accounts.

**Internal consistency**

1. Totals that are meant to be equal should be .

**Consistency with other data sources**

1. Consistency between detailed membership data and the accounts has been covered above in paragraph 55. However, there may be other data sources which we can usefully compare against data provided by the arrangement’s administrators.

**Common sense checks**

1. The old adage has it that the trouble with common sense is that it’s not very common.

[Point carried forward from data spec section - In addition, problems arising from treatment of members with unknown dates of birth should be easy to spot with this approach, as all such members should be identified clearly under such an approach, rather than allocated (sometimes by unclear processes) to particular ages as can happen under a “data by age” approach.]

**Other points**

1. If there is any chance for this, it can be helpful to have involvement when clients (or even potential clients) plan, construct or upgrade their administration databases, to ensure that the need for data for actuarial valuations is not overlooked in database design.

**APPENDIX A – EXAMPLE OF HIGH-LEVEL FINANCIAL AND OTHER HIGH LEVEL DATA THAT MAY BE REQUESTED FOR WORK INVOLVING PROJECTIONS OF THE FINANCES OF A SOCIAL SECURITY ARRANGEMENT**

* **Legislation** governing the arrangement, whether parliamentary legislation, or internal documents. There may be a problem if these are not available in English

It may become apparent that some aspects of the arrangement are not being operated in strict accordance with the legislation as we understand it. While we can point this out to our clients, generally the administrators of the arrangements, this may or may not be helpful to them. We generally have no expertise in local law. In such circumstances it makes more sense to seek **details of the actual operation of the arrangement**, and the circumstances under which this can change. Our ultimate report should

* + state our understanding of the operation of the arrangement,
	+ possibly point out that this does not appear to be in accordance with the legislation by our reading of it
	+ makes suggestions as to the modification of the actual operation of the arrangement if part of our remit/terms of reference for the work, or if it would substantially improve the operation of the arrangement
* **Annual report and accounts** (audited) for each year of the (inter)valuation period
* Audited **statement of the assets** as at the effective date of the valuation (if not included above
* Leaflets, posters, webpages and other sources giving details of the benefits, contributions and other terms of the arrangement as **communicated to members** of the arrangement (where these are available in English or another language we can competently understand)
* **Internal guidance** on matters such as benefit and contributions administration, data keeping, investment policy and practice

**APPENDIX B – EXAMPLE OF MEMBERSHIP DATA THAT MAY BE REQUESTED FOR THE STARTING POINT OF A VALUATION**

A social security arrangement offers the following benefits:

* On old-age (age 60 or above) with more than 20 years’ service: a pension based on the better of years’ service (capped at 40) times final salary or accumulated contributions with interest
* On old-age (age 60 or above) with less than 20 years’ service: a lump sum based on the better of years’ service and final salary or accumulated contributions with interest
* On ill-health/disability with more than 5 years’ service: a pension for life based on (service plus enhancement) and final salary
* On death in service: a lump sum based on the better of three years’ final salary or accumulated contributions with interest
* For survivors on death while in receipt of an old-age or ill health/disability pension: a pension to a widow/widower of half the pension the person was receiving plus a further 1/8th of the pension in respect of each child under age 20 (maximum 3 children)
* For survivors on death not in receipt of a pension: a pension to a widow/widower of half the pension the person would have received had they retired on ill-health/disability grounds on the day of their death plus a further 1/8th of the pension in respect of each child under age 20 (maximum 3 children)

Note that people below pension age who will give rise to pension payments in future may or may not be working at the effective date of the valuation, or in the past year, or even in the inter-valuation period.

This arrangement, with its maxima and minima for pensions in payment really needs a valuation approach using individual data and micro-level modelling. However, this may well not be possible, whether for budget, time constraint, data quality or other reasons. So the following is a list of grouped data that would be required for projections.

* Numbers of old-age pensioners by sex and age, and amounts of pension for each sex and age “cell”
* Numbers of ill-health/disability pensioners by sex and age, and amounts of pension for each sex and age “cell”
* Numbers of survivor pensioners by sex and age, and amounts of pension for each sex and age “cell”, ideally split between survivors pensions following death of an old-age pensioner, death of an ill-death/disability pensioner and death of member below pension age and not in receipt of a pension. Might want to consider whether we require separate details of children with pension rights – much would depend on whether the children’s pensions were identified separately in the administration database or merely as additions to a pension to survivors.

(Note that for data for the starting point of the valuation we don’t need anything on deaths of people below pension age giving rise to lump sums before the effective date. Cashflows from past lump sums will already be reflected in the financial statements

**APPENDIX C – EXAMPLE OF THE MEMBERSHIP DATA THAT MAY BE REQUESTED FOR THE ANALYSIS OF EXPERIENCE**

1. Appendix paragraph 2.f [↑](#footnote-ref-1)