Life Insurance Practice Committee

Technical Paper: Analysing Disability Income Experience and Setting Best Estimate Assumptions

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1. Introduction

1.1 Status of Technical Paper

This Technical Paper (TP) was prepared by the Life Insurance Practice Committee (LIPC) of the Actuaries Institute and the Disability Insurance Task Force. It does not represent a Professional Standard or Practice Guideline of the Actuaries Institute.

This TP discusses considerations and approaches relating specifically to Disability Income (DI) products. It does not override the mandatory requirements in Professional Standard 201 – Actuarial Advice to a Life Insurance Company or Friendly Society (PS 201) and the requirements in Practice Guideline 1 – General Actuarial Practice (PG 1) that are relevant to work performed in this area. Attention is directed to the requirements of PS 201 and PG 1 as they relate to DI experience investigations and assumption setting.

This TP does not constitute legal advice. Any interpretation or commentary within this TP regarding specific legislative or regulatory requirements reflects the expectations of the Institute but does not guarantee compliance under applicable legislation or regulations. Accordingly, Members should seek clarification from the relevant regulator and/or seek legal advice in the event they are unsure or require specific guidance regarding their legal or regulatory obligations.

This is the first version of this TP. It builds on and replaces the Information Note: Analysing Disability Income and Setting Assumptions dated April 2017. This TP does not repeat the content of the Information Note: *Framework for Setting Life Insurance Best Estimate Assumptions,* which contains general material on setting best estimate assumptions for life insurance companies (including Appendix B on the use of GLMs and multi-variate analyses, and Appendix C on credibility).

1.2 Background

DI products are complex products subject to considerable experience variability and future experience uncertainty. The environmental factors contributing to claims incidence show significant variability over time. Long term benefits require periodic reassessment of incapacity where the medical, biopsychosocial and environmental factors can vary significantly over the duration of the claim. The design of some products can exacerbate this by creating multiple options for the claimant to remain eligible for claim while optimising their combined insurance and non-insurance income. These factors contribute to what insurers often regard as subjectivity in "unable to work" assessments.

DI product experience is therefore heavily impacted by factors such as economic trends, cycles and levels (such as wages growth versus inflation, employment prospects and

consumer/worker confidence) and societal trends over time (such as mental health trends; impacts of technological changes on the nature and availability of work; and community expectations and attitudes including determinations and rules of regulators and mediators).

There is an increasing need for a robust framework to analyse and set DI assumptions to allow for the interaction between DI product terms and external environmental factors; the combined effect of which is referred to in this TP as "product optionality". There is currently only limited coverage of DI assumption setting in the Actuaries Institute's Life Insurance specialist course and no detailed life insurance DI specific guidance on this subject. This TP aims to help Members in this regard.

The ADI 2007-11 table (released in 2015) was the first Australian retail industry standard disability table published in 20 years, since the IAD 89-93 table was issued. This table was updated by the ADI 2014-2018 table which was released in 2020. The release of the inaugural 2010-13 Australian group insurance claims experience study by Rice Warner in 2015 was the first study based on credible industry claims incidence and termination data for group business. These tables bring with them new considerations as well as highlighting the number of factors typically considered when analysing retail and group DI experience.

The industry aggregated and published tables are critical but not sufficient to set best estimate assumptions for future experience. In addition to adjustments to calibrate for trends and insurer specific experience, they may need significant adjustment/modification to adequately reflect product optionality including the impact of other factors such as economic cycles and societal trends.

1.3 Objective

This TP provides information to life insurance practitioners regarding DI processes and experience analysis to assist with setting assumptions regarding future claims experience for pricing and valuation.

1.4 Scope

This TP applies to both individual business in respect of DI products and group business in respect of Group Salary Continuance (GSC) products. For ease, the term DI is used throughout this note to refer to both individual and group products.

DI Experience analysis can be conducted for a variety of purposes such as valuation, pricing and effective claims management. This note is intended to be generally applicable wherever DI assumptions are set and reviewed by a Member.

1.5 Reasonable Judgement

Whilst this TP suggests matters for consideration when analysing DI claims experience and setting assumptions for future experience, the need to employ reasonable actuarial judgement and consider materiality would apply in all situations.

This TP does not suggest that the scope of any DI investigations should be disproportionately large when compared with the materiality of the assumptions to be determined or the benefit users would expect to obtain from such investigations.

2. Complexity of DI products and market

As noted in Section 1, DI products are complex and involve a number of features and terms, with policies accepted under complex underwriting standards and rules, and managed via complex claims management philosophies and approaches. There is also significant variation in products and approaches to underwriting and claims management across the industry and within individual insurers. In addition, these factors and important environmental factors are likely to vary over time and into the future.

2.1 Complexity in understanding experience

It is important for Members analysing DI experience, setting assumptions and applying those assumptions in valuation and pricing models, to ensure they have a sound understanding of these aspects, including:

- The key product benefits and terms, and how the different benefits (such as core benefits and ancillary benefits) interact and impact on claims experience (e.g. ancillary benefits available in the waiting period may impact core benefit experience that might be expected to vary by waiting period);

- The interaction of multi-tiered definitions and benefits (e.g. partial and total disability) that essentially create optionality for claimants to remain on claim. The interaction of these factors is not necessarily "linear" nor "well behaved", resembling more the behaviour of complex "derivatives". The distribution of claims cost outcomes is therefore likely skewed. The degree of skewness is affected by the product design and the availability and attractiveness of options in benefit designs in the unknowable future economic and social environments.

- How information about the insurer's claims processes are recorded in the insurer's administration, claims management and accounting systems will impact on the data

available to be analysed by the actuary (Appendix A includes an overview of common approaches that may be helpful to consider in this respect).

Quality data is critical to soundly assess experience of DI portfolios, especially in times of significant experience variability and uncertainty. It is important that Members provide clear advice to insurers about deficiencies in the quality of existing data, and opportunities they see for further data collection and analysis which may reduce uncertainty in assumption setting.

Most insurers in Australia are unlikely to have sufficient data on a standalone basis to assess current experience with full statistical credibility across the full range desired for setting necessary assumptions. Even the largest insurers have limited long duration claims experience to allow statistically credible sub-sector analysis. Experience analysis and assumption setting will likely include consideration of broader industry experience. In doing this it is desirable, within the practical limits of information availability, to understand any key differences between the insurer's portfolio being analysed and the broader industry "average" portfolio that may impact relative experience. Such difference may include variations in:

- Product features, disability definitions and other terms (e.g. liberalness of definitions; significant, atypical ancillaries);
- Approach to underwriting, claims management and rating factors (e.g. providing income replacement ratios above/below industry average; occupation categories);
- Claims reporting rules (e.g. when claims are recorded as notified, accepted, etc).

Utilising and benchmarking against industry data and experience needs to allow for the material effect of such differences.

2.2 Complexity in assumption setting

Assumption setting considers the historic period to which the experience analysis relates and the period for which the assumptions will be used. It is important that judgement is applied in setting assumptions that are appropriate for the projection period and not just reflective of past experience. PG 1 details how the user and purpose of the modelling are key considerations in assumption setting.

Whilst insurers can analyse past experience and have access to the Australian retail industry standard disability table showing industry experience, there still remains considerable uncertainty in DI assumption setting.

In considering uncertainty it is helpful to consider 2 components:

- Random variations that reflect outcomes based on a fixed statistical distribution; and
- Systemic variations that reflect outcomes where there is either a change in parameters for the distribution (e.g. trends) or a wholly new statistical distribution (e.g. product options).

For DI in particular, there may also be significant parameter uncertainty because the historic experience data may have lower credibility for setting assumptions.

In this TP uncertainty is a concept that recognises that actual future outcomes will vary from the assumptions made. It encompasses both random and systemic variations.

3. Data Considerations and Validation

3.1 Data Sources

Key sources of data for a DI experience investigation may include:

- The insurer's own claims data (can be in the form of payments data, regular census snapshots or a combination) containing:
    - Claim details (e.g. date of disability, cause, status, policy details including policy number, claim number, whether claim is under dispute);
    - Claim transactions ideally including benefit type (e.g. main or the ancillary benefit identifier), date of transaction, relevant effective dates, nature of transaction (if different from a pure claim payment), data showing reasons (if relevant) why payment is different to sum insured (e.g. offsets, partial benefits, reduction for indemnity policies due to income at claim time insufficient to support contractual insured benefit, etc.); and
    - Reason codes for changes in claims clause or status (if available).
- Exposure data
- Mapping tables or data dictionaries
- General ledger / accounts (actual cash movements)

Data and information which may not be required to run the mechanics of the experience investigation but will help interpret the experience include:

- Underwriting data, and more general information about changes in underwriting philosophy and approaches affecting the portfolio of business being investigated;
- Richer individual claims data including biopsychosocial data, more detail about reasons for changes in claims status or cause or other events during the course of claim, other claims management changes, projects and initiatives in the period;
- Economic information about the experience period and relevant years prior, as described elsewhere in this note;
- Regulatory and other changes in the industry environment relevant to the experience period.

3.2 Data Consistency

The treatment of data in the experience investigation and setting of assumptions needs to be consistent with both the data to which the assumptions are applied and how the assumptions are used in models, considering both pricing and valuation models. Whilst this is applicable to all analyses, there are specific features of DI data and DI experience investigations due to the complexities of the product. These include:

- Two "decrement rates" being incidence and termination rates (noting that claims development patterns can impact on both incidence and termination experience if insufficiently developed).
- DI claims are paid and managed over a period, rather than a single cash flow based on one claim decision at one point in time. This means claim payments can be lower than the contractual sum insured for a number of reasons, including partial benefits, offsets, insufficient income at claim to support full sum insured (as is the case for indemnity products), and claims closure followed by claims re-opening at a later date.
- The presence of ancillary benefits and their interaction with basic benefits (for example no basic benefits are paid whilst a specific injury claim is paid).

3.3 Data Checks and Validations

Checks and validations that may be performed include:

- Reconciling payments data to the accounting system;

- Formatting - e.g. date format, length, blanks. These checks are normally driven by the experience investigation model;
- Identifying duplicate data;
- Reasonableness checks on individual data fields. For example, ages expected to be between 15 and 70, reasonable benefit amounts;
- Ancillary benefits - Check that the labelling of ancillary benefit payments is adequate for the manner in which ancillary benefits are to be treated in the experience analysis, assumption setting and actuarial models;
- Consistency checks between data fields within each dataset (e.g. within claims data and within policy data);
    - Order of dates correct - date of birth before date of entry and order of claim dates is consistent with the claim lifecycle;
    - Disability date + waiting period = first payment start date;
    - Claim closure reason consistent with policy benefits;
        - length of claim consistent with status of benefit period expiry or not;
        - the claim closure date is consistent with the effective date and implied payment period for claims that are managed on a "pay and finalise" approach;
    - Different claim records for the same claim are consistent within the claims data e.g. monthly benefit amount insured does not increase by more than indexation rate from one year to the next;
    - Treatment of re-opened claims to ensure consistency with the modelling approach; and
    - Commutations - Check that any very large claim payments are commutations or another form of settlement, and that the data is in a form suitable for the way the company treats these in the termination experience analysis.
- Consistency checks between datasets over time (e.g. between policy data at t and policy data at t + 1) and between different datasets (e.g. between claims and policy data)

- Does a record exist in both the start and end of period?
  - Is this expected or not? No claim at the end of period should exist if it has been terminated, no policy is in force at the end of period if it lapsed
  - If exist in both, do the fields match for example gender, occupation etc
- Do all claims have a record in the policy data at the claim event date?

Exceptions identified through the checking process could be investigated to determine what adjustments, if any, are required to be made to the data i.e. there may be appropriate reasons for the exception or the impact on the experience investigation results may not be considered material.

4. Understanding Historic Experience

This section describes some typical considerations when understanding the drivers of DI claims experience and determining which drivers to include in an experience analysis.

4.1 Internal Drivers Affecting Claims Experience

Internal drivers specific to the insurer can influence DI claims experience. Examples of internal drivers are the underwriting, claims management, product design, mix of business (which may be influenced by pricing strategies) and selling practices.

Anti-selection may result from the approach to management of internal drivers. For example, one objective of underwriting at policy inception is to appropriately price for medical and other risks entering the insurance pool. All other major pricing characteristics being equal, this may lead to better claims experience at early policy durations than the experience across all policy durations. The presence or absence of this underwriting selection effect can be observed when analysing incidence experience, and potentially claims termination experience, by policy duration.

Other forms of selection may be observed in the experience. For example, incidence and termination experience might be adverse on policies with higher income replacement ratios as these policyholders may have more financial incentive to claim and/or less incentive to return to work. At time of writing this note, data on replacement ratio is generally not readily available for all in-force business in insurers' policy administration systems. This is an example of a situation where Members could be advising insurers on the importance of the sound capture of important risk and behaviour data in their administration systems.

The interaction of anti-selection with the lapse experience of the portfolio could be considered. This extends to assessing the impact on the remaining risk pool of premium increases arising from re-pricing as well as competitor activity.

The claims management processes would impact the terminations experience.

- For example, the claims function may run a project to review long duration claims. This may lead to improved experience at these longer durations that could be taken to imply an increase in long duration termination assumptions would be appropriate. However, making such a change would benefit from consideration of the sustainability of this experience. For example, the claims function may review claims at all durations leading to favourable experience in the current year, but conversely worse experience in the future on current claims as those remaining may now exhibit lower termination rates.

- There may have been changes to claims management processes. For example, introduction of new triaging approaches, increased rehabilitation usage or new biopsychosocial indictor tools (with management responses) that are intended to improve claims outcomes. Care is needed in assessing the impact of these initiatives because short duration termination rates may improve and longer duration termination rates deteriorate. That is, the net benefit could be considered so it is not overstated and the uncertainty of longer duration termination rates understood.

- Other changes may also be relevant to consider, e.g. changes in claims philosophies, key personnel or outsource provider changes.

4.2 External Drivers Affecting Claims Experience

DI claims experience can be influenced by external drivers such as changing regulatory requirements, medical advances, the economic cycle, lawyer activity identifying weaknesses in an insurer's practices related to procedural fairness, or improved policyholder understanding of their benefits. Changing policyholder behaviour could have a significant impact on disability income experience if it leads to increased incidence or longer claim durations. Community expectations may be expected to continue to change with external factors such as increased media scrutiny, external mediator approaches, as well as changing societal attitudes towards important causes of claims, particularly mental health and wellbeing. These factors may be reflected in rulings for fairness by the Australian Financial Complaints Authority (AFCA).

It could be considered whether these factors are one-off, permanent or part of an ongoing trend. This will inform the view on how the factors could impact future incidence and termination rates in assumption setting.

Considering these trends and drivers, Members could consider if experience analyses need to include parameters/trends related to:

- chronological time (e.g. reflecting overall societal trends); and
- economic activities status and/or consumer/business confidence to reflect experience related to economic cycles.

4.3 Approaches to interpreting trends

Members could consider what analysis could be conducted using more advanced analytic techniques to reduce uncertainty in assumption setting. Techniques may include generalised linear models, and others such as those set out in Appendix B of the Information Note: *Framework for Setting Life Insurance Best Estimate Assumptions.* It is strongly suggested that the results from advanced analytic techniques are thoughtfully reviewed and interpreted and a judgement overlay applied.

Appendix C of this TP provides detailed information on how to identify and allow for trends, step-shifts, cyclic effects and cohort effects in setting assumptions and provides alternative analyses methods to the historic approach many Members have adopted to multi-year aggregated incidence and termination rate analysis.

5. Setting Assumptions

5.1 Timing Considerations

As DI is complex and experience can be volatile, the actuary could give consideration to reviewing key, material experience annually.

Particular attention may be given to the experience period. A long-term view when setting assumptions will minimise short term statistical variability and where analysed, yield insight about longer term cycles and underlying trends. However, short term trends may result from structural changes in incidence and terminations thus affecting Incurred But Not Reported (IBNR), Closed But Not Reported (CBNR)[1] and reopen claim reserves. Insights from claims management and product management relating to the nature of observed trends can aid in developing assumptions.

[1] Refer to A.2.5 for details of the definition

Consideration will also need to be given to the timing and ordering of IBNR, Reported But Not Admitted (RBNA) and Claims In Course of Progress (CICP) assumption setting. This is because RBNA and CICP assumptions will likely be used in determining ultimate claims costs and hence the IBNR assumption.

Ancillary benefits also need to be considered carefully. Many ancillary benefits are "upfront", occurring near the start of a claim. The assumption setting and modelling approach could ideally reflect timing to ensure over- and under-reserving effects are minimized, having regard to the level of materiality of the benefits. If the termination rate analysis is done by benefit payments then care needs to be taken to avoid misstating early duration termination rates because payments in early periods of a claim may be particularly vulnerable to ancillary benefit payments and income offsets.

5.2 Modelling Considerations

The actuary may need to consider whether the assumptions are consistent with any simplifications or approximations that exist in the modelling. For example, a DI claimant that has recovered might return to the pool of active lives but could have a higher probability of going on claim again. Where the adopted modelling methodology explicitly projects these recovered policyholders, the experience investigation might separate these policyholders in the incidence investigation in order to derive explicit incidence assumptions for this cohort. Another matter may be that office practice can mean claims are managed on a monthly basis which may not be easily transformed to a weekly termination rate.

Consideration could also be given to how any waiver of premium benefits are modelled - i.e. whether there are any disabled lives in the active lives projections where the incidence rates are applied (for example in a multi-state model which projects recoveries of disabled lives) or whether disabled lives are excluded due to being on claim.

If a simplification has been employed, consideration could be given to whether the claims assumption setting allows appropriately for the method of simplification, so that modelled claims cost is neither over nor under stated.

Consistency of timing (e.g. initial vs central exposure) in experience analysis and modelling is critical in modelling claim terminations.

5.3 Consistency between incidence and termination assumptions

Common practice is for the experience analysis and assumption setting for incidence and terminations to be done separately. Extra care may be taken to ensure the input claims data, experience analysis methodology applied and the assumption setting approach

adopted is consistent between the two components or that the inconsistency is understood and immaterial.

Examples of where inconsistency may arise include:

- Treatment of reopened claims and paid and finalised claims in the experience analysis;
- Ancillary benefits are not explicitly analysed or modelled inconsistently between incidence and termination;
- The level of granularity at which the incidence and termination analysis is performed;
- Approach to allowing for partial benefits, offsets and application of indemnity provisions to reduce the benefit payment below the sum insured where those adjustments may exhibit a different termination pattern;
- Consistency between incidence rates that are often claim cause agnostic and termination rates that typically vary by claim cause (and other inconsistencies);
- The basis on which the assumptions are determined (e.g. switching between count and amount basis)

The consistency is crucial to ensure the overall claims cost projected in the model (as an outcome of the incidence and termination assumptions) is in line with the actual claims cost. One option to consider whether any element of inconsistency may be distorting the overall basis is to compare the expected claims cost to the actual claims cost (historical payment plus reserves). For GSC it is often the case that a loss ratio approach is used after termination rate assumptions are set. This may reduce some of these issues (and introduce other issues related to understanding of underlying incidence experience changes).

5.4 Quantification of Individual Policy Drivers

The standard analysis variables common to most disability income investigations relate to policy characteristics such as: gender, age, product type, smoking status, medical underwriting, duration since policy issue, distribution channel, sum assured, occupation or employed vs. self-employed, known impairments, calendar year or financial year, premium type (stepped / level) and class of business (super / ordinary).

However, there are also some factors specific to DI that could be considered:

- Indemnity or agreed value – whether the benefit is a guaranteed amount or based on income in the period prior to disablement.

- The definitions of disability applicable, and changes in the definition of disability over time with its consequent impact on terminations e.g. own to any occupation.

- Replacement ratio - The differing income replacement ratios could affect the incentive for claimants to return to work.

- Waiting period – The time following the incidence of the claim required to pass before payment of benefits begins.

- Benefit period – either fixed term or to age.

- Cause of claim – Some standard tables have overlays for termination assumptions based on claim cause (accident/sickness being most common). By applying more granular assumptions for major cause types, the reserve will change more organically with the mix of claims. This leads to improved forward-looking termination assumptions for claims in course of payment. Where incidence assumptions are also grouped in a consistent manner, it leads to a more forward-looking pricing assumption. Claims could be grouped into major causes e.g. cancer; mental Illness; nervous disorder; cardio-vascular; musculoskeletal; other sickness; and accident. Analysis by "objective" versus "subjective" claim status may be considered, especially given the potential for the progressive shift in the prevalence of the latter over time;

- Late notification – Claims with delayed notification might have lower terminations than claims notified soon after the claim event as there is no possibility of early intervention for these claims. In addition, rehabilitation and retraining could be less effective for claims that are notified late.

- Duration from date of claim – The duration of a claim is a significant factor in their ability or willingness to return to work. Generally, due to high termination rates at earlier durations there are fewer claims in the analysis of longer duration claims. However, the assumptions at these durations often have a large impact on reserves – particularly for claims that have age-based benefit periods. The comparison with other information, including industry tables, together with a consideration of credibility of a portfolio's own experience is important. Where the insurer's own experience has insufficient credibility, external information such as the standard table termination rates may be used with suitable creditability adjustment unless there is sufficient reason to depart from it.

- GSC - voluntary or default. Members with voluntary cover might be expected to have less favourable experience than members with the scheme's default level of cover, as members opting for additional voluntary cover may have different experience than those with default cover.

- GSC – employer/industry. Different types of fund (public offer vs closed membership) or funds from different industries may have different claims incidence/ terminations experience.

- Other possible variables could be considered e.g. cancellable vs. non-cancellable policies, the level of claims indexation, the extent of financial underwriting and the geographic location of policyholder (post code, state, city/regional).

- Other data collected at underwriting or in course of claim assessment and management (e.g. biopsychosocial data, claims subject to lawyer involvement, disputed claims, or other specific changes in underwriting or claims approaches) may be investigated, to help understand the experience, even if not formally rating factors for pricing or part of the actuarial projection model.

Which of these drivers, if separately quantified, materially impacts the end result needs to be assessed and considered. Consideration could also be given to the fact that the impact may be different for different applications (e.g. liability assessment of a given current mix of business versus pricing for an unknown future mix of business). It is likely that not all the above factors will be material for all purposes.

5.5 Review of Individual Policy Drivers of experience

The actuary could re-examine the drivers of DI claims experience regularly. One technique used to identify the key drivers and risk factors for DI claims is cognitive mapping. Cognitive mapping involves depicting the dynamics of (often complex) systems visually. The underlying causal relationships to be mapped can be garnered through discussions with subject matter experts in areas such as underwriting, distribution, retention, claims, pricing, valuation, value, business insights and risk.

The use of relevant analysis tools to objectively identify key experience drivers may also be relevant (as discussed in previous sections). To support this analysis, the actuary may advise the insurer of additional categorical data that should be collected to in future improve understanding and reduce uncertainty in assumption setting.

6. Uncertainty in DI Assumption Setting

6.1 Sources of uncertainty

There are different sources of uncertainty underlying future DI experience. When setting assumptions for the future, Members may consider and advise insurers on factors such as:

6.1.1 *Future claims experience shifts including trends*

Trends are defined as a systematic change in experience over a period of years. This would include potential future environmental and societal changes (such as social attitudes, medical and regulatory factors). An example is society's attitude towards procedural fairness and mental health conditions as reflected in AFCA determinations. Other examples of environmental factors are the impact of technological change on workers' wage growth, work availability, nature of work and work security.

Trends and other experience shifts that have been observed in recent experience data could be considered in best estimate assumptions for future claims costs. In particular, the actuary could consider and comment on the following sources:

i. The statistical distribution of random variations using the credibility adjusted average of past experience plus an allowance for any asymmetry in that statistical distribution;
ii. Future changes in the statistical distribution that are strongly suspected based on historic step-shifts or trends in the observed experience; and
iii. The extent that the best estimate assumptions from (ii) above do not allow for the future continuation / extrapolation of trends in observed past experience. Despite the systemic cause for these differences being unknown, the actuary could consider whether it is optimistic to ignore the difference because: (a) the impact of past product design changes is not well understood and resilient, (b) the environment is shifting, (c) there is a trend in the company's marketing and/or underwriting standards and (d) there is a trend in the company's operational practices including claims management.

Appendix C details a number of types of experience shifts including trends, step shifts, cyclical effects and cohort effects. Each source could be considered in setting best estimate assumptions.

6.1.2 *The economic cycle*

For cyclical items, for example the effects of economic cycles on experience, a possible approach could be to set incidence and termination assumptions that reflect the expected midpoint of the economic cycle. This approach will lead to a misalignment between

assumptions and experience at the peaks and troughs of the cycle (and consequently profits that follow the cycle) but could result in a more stable assumption over time.

An alternative approach is to set a dynamic economic cycle adjustment that changes over time based on economic indicators. This approach can lead to more volatility in the best estimate assumptions but may better reflect the impacts of the prevailing economic environment in the short term.

It is necessary to distinguish between what may be short term economic cycle impacts versus trends discussed in section 6.1.1. The approach for incurred claims liabilities and future claims may also be different.

6.1.3 *Credibility approaches and cohort effects*

The non-independence of assumption parameters and cohort effects in termination rates are sources of uncertainty. For example, the level and types of claims incidence may influence termination rates. For a cohort of claims the level of terminations at one duration is influenced by that cohort's experience at earlier durations and in turn influences its experience at later durations.

Consideration could be given to the extent that the credibility approach could lead to setting optimistic assumptions for longer claim durations, such as:

- A scenario where both long and short claim duration experience is favourable and there is limited long duration experience (therefore not very credible). In this case, if long and short duration claim assumptions are set by credibility-weighting on the combination of short and long duration experience there is a risk that too much credibility is given to the long duration experience and assumptions could be optimistic; or

- Equally, if short claim duration experience is favourable and long duration experience is unfavourable then credibility-weighting long duration termination rates on only the long duration experience may place too little credibility on adverse long duration experience and the assumptions could also be optimistic.

Consideration of the credibility approach used across different cohorts of business could avoid unintentional optimism in the assumption set. The relationship between parameters is complex and may vary over time and in various conditions.

Refer to Appendix C for more information on setting assumptions considering cohort effects.

6.1.4 *Product design and the environment*

Other potential sources of systemic changes that may not have appeared in historic experience data and the actuary could consider in their best estimate assumptions include:

iv. Recent/future changes in product design and/or definitions with consequent limited available data with which to estimate the mean;
v. As noted in section 2, optionality in product design and multi-tier definitions that may increase skewness in the distribution of claims cost and, thus, could be considered as a cost in the best estimate assumptions (i.e. history shows that product optionality and complexity in itself has a cost); and
vi. The possible interaction between product designs and policyholder behavioural effects as well as potential future changes in the environment (e.g. societal, regulatory and economic) that may impact future claims costs.

For a new product or benefit it takes a long time for the overall claims cost experience to emerge, especially for long ("to age") benefit period products. Termination experience only emerges as the claims in course of payment build up and mature into longer durations. Measured product performance in the early years is highly dependent on assumptions not yet backed by credible experience for that product/benefit.

Best estimate assumptions for longer duration benefits may include a larger component related to uncertainty than short duration benefits. This may be particularly apparent for termination rate assumptions where there is a combination of compounding affect and lower credibility of experience at longer durations.

6.1.5 *Asymmetry in the claims distribution*

Section 6.1.4 mentioned how optionality inherent in DI products skew the distribution of claims cost outcomes due to the changing attractiveness of various product options in unknowable future economic and social environments.

Examples of DI optionality that may skew the claims distribution include:

- Tiered total disability definitions;
- Partial disability benefits;
- Automatic indexation of agreed value sums insured;
- Lifestyle and other options outside of the insurance product;
- Customer decisions that impact the effective replacement ratio; and

- Future economic conditions impacting the relative value of the customer's product and other options.

For products with high optionality there may be considerable uncertainty surrounding the degree of asymmetry in the claims distribution for future periods over which assumptions will apply.

6.1.6 *Management actions*

When allowing for uncertainty in best estimate assumptions, it could be reasonable to consider assumptions related to probable management actions related to future consequential premium rate changes or claims management practices. This would give rise to consideration of how to model (explicitly or implicitly[2]) the value of management actions in respect of factors such as premium re-rating or claims handling.

Prospective changes in the insurer's claims management (and other operational practices) that are expected to offset (historic or future) trends in claims experience could receive careful consideration about whether the offset is partial, repeatable and/or compounds in future years.

It is common for approved future changes to premium rates to be included in modelling. Any such allowance could be combined with consideration of assumptions related to side effects of the changes (such as anti-selective lapses) and other factors that may increase future uncertainty in claims cost.

Consideration of the insurer's pricing philosophy is likely to reveal a range of practical and market related factors that mean any future repricing will at best only partially offset the uncertainty crystallising. That is, premium rate increases are likely delayed and/or capped compared with the range of outcomes arising from the uncertainty crystallising. Particular consideration is likely for uncertainty arising in termination rates after claims are incurred (and, thus, premium rate changes cannot offset the cost).

6.1.7 *Other sources of uncertainty*

Other sources of uncertainty underlying future DI experience include:

- How any reinsurers may exercise their re-pricing rights; and

[2] An explicit repricing allowance means that application of the insurer's pricing philosophy is incorporated into the projection of premiums. An implicit repricing allowance means that the claims cost assumptions are modelled net of an assumption for premium rate repricing.

- Shock events such as pandemics and/or black swan events.

6.2 Approaches to valuing uncertainty

The best estimate assumption setting process might usefully include an assessment of parameter variability or uncertainty in respect of vulnerability to the effects detailed in section 6.1. These variability parameters may be considered as part of the best estimate selection process. This could provide critical input to the processes of applying the best estimate assumptions, especially in the context of activities such as: (i) product design, (ii) pricing (margins for risk and Return on Equity), (iii) application of the insurer's pricing philosophy, (iv) capital management, (v) reinsurance and (vi) risk management strategies.

This approach is likely to highlight higher uncertainty for factors including:

- long duration benefit periods;
- multi-tiered disability definitions;
- multiple benefits for similar conditions (e.g. partial, total disability, day 1 accident, …); and
- long term guarantees on product terms.

A Member would typically allow for uncertainty using one of the following approaches:

a) The assumptions are true best estimate assumptions because they recognise that the unknown and likely skewed distribution arising from uncertainty has a cost; e.g. the probability weighted claims cost is more likely to increase as a result of uncertainty than reduce;

b) Risk and/or pricing margins separately allow for the cost of uncertainty because the claims cost (and other) assumptions are not true best estimates; or

c) The capital requirement may be increased. Careful consideration of this approach could be beneficial because (i) the actuarial cost of capital is typically a charge for the frictional cost of holding capital, (ii) the cost of capital typically doesn't allow for the probability of using the capital that is usually separately costed using methods (a) or (b), and (iii) the capital requirement itself is often calculated for short duration extreme one-off (black swan) events rather than systemic effects that gradually emerge and recur over many years.

To illustrate, longevity for annuities is typically modelled with the best estimate assumption including a projected longevity improvement and, in addition, a capital requirement component should the best estimate be inadequate. This same principle could apply to modelling uncertainty in DI products.

If option (b) or (c) is utilised then the actuary may comment on how the approach reflects the relative uncertainty of different products / features and the cost of that uncertainty.

Consideration could be given to differences in the level of uncertainty for different benefit designs and product options as policyholders' behaviour changes in varying economic conditions as societal attitudes change over time. The level of uncertainty would therefore likely be higher for longer benefit periods and consideration could be given to allowing for the higher uncertainty in longer benefit periods and products with more optionality.

Perhaps the most complex consideration may be how this approach interacts with valuation of the insurer's potential future management actions (see section 6.1.6).

7. Validating Assumptions

As with the data used, the actuary could take reasonable steps to review the consistency, completeness and accuracy of the results produced. The actuary could also consider describing the review in a report. This section provides some areas where DI specific checks could be performed in addition to the checks that would typically be performed for all experience analyses.

7.1 Internal Consistency Checks

The following internal consistency checks could be undertaken:

- Generally accepted relationships – for instance, smokers having higher actual and expected sickness incidence than non-smokers or termination rates reducing as the duration of claims increase;

- Spot checks - treatment of individual policies in exposure, expected and actual incidence and termination calculations can provide a useful check that the methodology is being applied consistently and as expected.

- Sensitivity checks – for instance, comparing ultimate actual to expected ratios under different IBNR/CBNR factors and decline adjustments on RBNA.

7.2 Comparing Results to Industry Experience

The company's results could be compared to industry experience in Australia as reflected in the 'DI Industry Experience Investigation Report'. This could identify underlying differences in the mix of business and time period the results apply to. The root cause of these differences can be difficult to establish, but the analysis can provide an independent benchmark. Particular care is suggested when considering variations in termination rates to the industry table because operational practices of an insurer at one claim duration can have an opposite effect on termination rates at another duration.

When a company is comparing its experience investigation to the industry study or tables, there may be major differences between the company's own experience investigation and the method used in industry study. Two areas where inconsistency often occurs are treatment of ancillary benefits and treatment of claims dormancy including re-opened claims.

Comparison with the industry study is easier if a company uses the industry table with adjustments in determining its assumptions. However, use of an alternative table and/or alternative analytical techniques, tools and model constructs are not precluded. The reasons for use of an alternative table and/or approaches may be documented including why the alternative table/approach will be an equal or better fit to its experience and/or the purpose of use. Applying the retail industry tables to group insurance (or applying group insurance experience to retail) would benefit from particular care because product design, underwriting, replacement ratios, market characteristics and demographics can be very different.

Industry studies would tend to have more credible data than a single insurer, particularly for smaller segments. Credibility theory could be used to weight internal versus industry experience, having due regard to fact that the industry table will typically reflect an older period than the company's own investigation, so any recent experience shifts or trends allowed for before applying statistical credibility concepts. Appendix C contains further comments on credibility considerations for DI best estimate assumption setting.

The results could also be compared to industry studies in other markets, taking into account differences in product structure and underlying drivers of experience.

7.3 Comparing Results to Financial Statements

When assumptions are built up from the company's own experience investigation, Members setting assumptions could check that any trends in that experience are consistent with observations from its Financial Statements and, in particular, results of the Analysis of Profit (AoP) on those Financial Statements. Inconsistency in messages between the two sources could indicate misalignment between the approaches to experience investigation, assumptions setting and/or cashflow modelling.

Although it may not be worth the effort of reconciling the experience investigation and the AoP, gaining an understanding of any significant recurring differences could be important. The inherent difficulties in comparing the experience investigation with the AoP include timing differences between the observation periods and factors in best estimate assumptions that allow for features not present in historic results in the experience investigation. Appendix B contains a summary of potential factors to consider when a comparison is done.

The comparison of AoP to experience investigation might highlight features of the claims distribution that are not obvious in a pure amount/count, incidence/terminations "mean value" analysis in an experience investigation. For example, termination rate experience deviations for benefits with longer duration benefit periods may appear small in a pure count A/E analysis and those same deviations may be amplified in a present value calculation . Equally, the mean of the multiplication of two skewed/correlated distributions is not equal to the multiplication of means. Overall, this may lead a Member to adjust their assumption setting or modelling to better reflect any correlations.

8. Philosophy in allowing for uncertainty and its communication

For DI products, the philosophy applied to allow for uncertainty in assumptions and how uncertainty is communicated is likely as important as the technical aspects discussed so far in this TP. Many considerations around the reporting and financial impacts of DI assumptions will be similar to those of other assumptions. The Information Note: *Framework for Setting Life Insurance Best Estimate Assumptions* contains discussion of these considerations.

8.1 Uncertainty and sustainability of DI products

A sustainable industry is essential for policyholders, future customers and insurers. For insurers, sustainability would enable an environment where risk exposure, financial performance and experience can be priced with a reasonable margin. Furthermore, when experience emerges it can be managed broadly in line with expectations so that insurers continue to sell insurance products that meet customer needs and shareholder required returns. For policyholders a sustainable industry should also result in relatively stable premium rates and product terms and conditions. The various types of uncertainty represent risks to sustainability.

At the time when this note was prepared, there has been a significant increase in claims cost for disability income benefits over a long period in Australia. Some of this is attributable to the community's attitude about claiming for, and remaining on, disability income benefits. Many types of occupationally defined disability income insurance, whether provided by a life insurer, the employer (workers compensation) or the government (NDIS and Disability Support Pension) have been subject to this trend.

Theoretically, assumptions could be set to capture the cost of uncertainty. However, sustainability is ultimately a function of factors such as product design, underwriting standards, claims management approaches, risk management strategies and marketing strategies. Members could consider their evaluation of uncertainty as a mechanism to help management assess the relative sustainability of the choices available to management.

8.2 Communication of uncertainty

The actuary could form a view on the degree of uncertainty in key assumptions and advise on future work or actions to reduce uncertainty. A clearly communicated view on the relative uncertainty of choices that management could take with product design, operational practices and risk management strategies may be critical to long term sustainability of the product. This could take account of aspects such as:

- Uncertainty is always likely to be asymmetric (and negative to the insurer) because (i) DI products have optionality in favour of the consumer and (ii) changes in social attitudes are unlikely to involve a reduction in expectations on insurers;
- Given the history of DI products and factors discussed in this TP, where there is a range of reasonable assumptions, there may be a strong case for having an assumption towards the higher claims cost;
- It may be common to need 5 years of experience before making a reliable judgement on the impact of changes. This is exacerbated for DI products where an improvement in claims incidence or early duration termination rates may result in adverse changes to termination rates at longer durations; and
- Past experience suggests there has been underestimation of the cost of new products and enhancements in the 20 years prior to this TP.

End of Technical Paper

Appendix A – Claims Processes & Reserving Processes

A.1 Claims process – the lifetime of a DI Insurance claim

The purpose of this appendix is to provide an overview of the lifetime of a DI insurance claim which is more complex and with more stages compared to a death claim and other lump sum based claims. Subsection A.1.7 sets out some potential areas for further consideration by reinsurers.

For this purpose, "a claim" is related to the same initial cause of claim and event/incidence date (as opposed to multiple claims by the same policyholder). A typical claim might involve the following steps; however, each company's process and product terms and conditions will differ slightly.

Figure 1: claims lifetime

Please note the steps above can be iterative and are not always sequential and timings will be influenced by the waiting periods and benefit periods of claims.

"Claim Assessment" includes claims management triaging, preliminary claims management approaches, preliminary bio-social and/or psycho-social assessments and initial claim entitlements.

"Ongoing Review" includes rehabilitation and return to work and claimant support activities, as well as management and reassessment of the level of claim payments.

It is important for the actuary to understand any material historical or intended future changes in the DI claims management process. Such changes could be considered when analysing experience and determining assumptions.

A.1.1 Claim Incident

An event happens which causes the life insured to meet the disability definition of the policy. This typically involves not being able to perform some or all of their work duties and being fully or partly absent from work as a result and/or being unable to earn their full normal income. Some other claims definitions may also entitle the policyholder to benefits - for example the death of the life insured for ancillary death benefits or an injury to a family member for family ancillary benefits. In the case of sickness claims, the incident might not be well defined. The sickness incident date might be taken as the later of date of diagnosis and the date on which

the insured started to meet the claims definition (for example being absent from work). This would follow from the product definitions.

A.1.2 Claim Notification

Initial notification

The policyholder or their representative such as a financial adviser notifies the insurer that they would like to claim under their policy. In the case of group insurance, more parties may be involved, and multiple notifications can occur in the communication "line", which can lead to multiple and different notification dates being recorded. In using the data for the experience investigation care needs to be taken that consistent data is used and applied consistently to assess and analyse experience, then to calculate reserves.

Initial claims information collection

Generally, for individual business, following an initial "notification", the insurer collects relevant event and claim information. This can be via any/all of online claims tools, phone apps, "teleclaims" processes and/or email/paper based forms. Concurrently or subsequently, the insurer may request additional evidence/information required.

Better practice would be to seek to obtain initial bio-social/psycho-social information/indicators for the claimant at this stage.

For group business, such information may be collected and communicated via the scheme administrator or other representative.

Not Proceeded With

Insurers typically record the initial notification as a claim, even though it may not have all the relevant information yet. Claims are closed as "Not proceeded with" if, for instance:

- during the information collection stage the policyholder realises they do not have a valid claim; or
- the life insured does not complete the information collection request within a certain timeframe. This might happen if the policyholder realises they might not have a valid claim or if the policyholder's health improves enough that they no longer have a claim.

Detailed claims notification

Also known as the "information received" stage, the policyholder or their representative provides the requested information, including any additional evidence/information as requested by the insurer.

A.1.3 Claim Assessment

Evaluation

The insurer evaluates the claim based on the evidence/information provided.

This can involve any or all of:

- Preliminary claims assessment based on type of claim (including initial case estimate determination);
- Triaging of the claim, including allocation to appropriate, qualified claims assessor/case manager, initial claims management plan outline, including potential support and return to work needs (reflecting inter alia, cause of claim, occupation and bio-social/psycho-social indicators/assessments);
- Need for further evidence/information or assessments, including requesting the claimant participate in independent tests/medicals carried out by a medical or allied health professional on behalf of the insurer (typically at the insurer's cost). Such an assessment will often include policy validation for retail policies (disclosure assessment) and eligibility for group policies (disclosure assessment where applicable and qualification under the group policy rules).
- Consideration of the availability of offsets from any other income (such as workers compensation or other policies) as well as current income level for indemnity policies.

The reinsurer will have different levels of involvement in claims assessment depending on the level of reinsurance, authority limits and the services agreed to be provided.

Decision

The insurer makes a preliminary decision whether to accept and commence paying benefits and implementing the claims management plan, commence payments subject to further analysis/assessment, or decline the claim.

This decision will be made in accordance with relevant policy terms and conditions, Life Code of Conduct and insurers claims management philosophy; including allowing for waiting period if applicable.

Disputed claims

If the claim is declined, or the client believes the payment terms are unsatisfactory, a dispute might arise. This might either be settled between the insurer, the policyholder and its representatives (internal dispute resolution; IDR) or it might involve a third party dispute

resolution process or legal proceedings (external dispute resolution; EDR). A dispute might also arise throughout the claims duration (often due to calculation/ partial or benefit entitlements disputes) or at the claim closure step.

Ex-gratia payments

Under some circumstances, the insurer may make ex-gratia payments. These discretionary payments arise out of a business decision, rather than a legal liability.

A.1.4 Claim Payment

Ancillary benefits paid

Approved ancillary benefits might be paid during the waiting period should the policy terms allow, for example rehabilitation and accommodation benefits. The amount paid is typically determined by the policy features and/or the sum insured according to the specifics of the relevant ancillary benefit.

Some ancillary benefits are add-ons to a normal DI product and have grown significantly in number over time. Many of these benefits are used to differentiate between various tiers of DI cover.

Other such as rehabilitation support are likely to reflect core claims management and claimant support tools and arrangements than "ancillary' extras.

Regular benefits paid

At the end of the waiting period, the insurer starts to pay the regular income benefits and any further ancillary benefits payable. Payments are typically made monthly in arrears, but practice differs across the industry and payment terms might also differ for specific claims based on that claim's features. For example, claims with higher duration have more certainty a claim will remain in force and multiple months' benefits could be paid at once.

The payment amount is specified by the policy terms and might take into account: the sum insured, the claimant's earnings in the period prior to the incident (for indemnity benefits), offsets, only partially meeting the disability definition and ancillary benefits as defined in the policy features. An implicit "payment" is premium waiver benefits where the benefit effectively pays the policyholder's premium.

Advance pay and close

Some insurers adopt a practice called "Advance pay and close" for some reasonably predictable claim types. This is where the insurer pays benefits in advance for all or part of the

expected claims duration and then closes the claim (as a recovery). The benefit payment is negotiated between the insurer and the policyholder. Claims assessors are typically given guidelines and authority to negotiate payments for specific types of claims only (i.e. where the disability duration is highly predictable) and on a restricted set of policies, for example limits to sum insured. If the policyholder remains disabled at the end of the benefit period paid in advance, they have to get the claim "re-opened".

In terms of reserving, this means that "Advance pay and close" claims might have a different (usually higher) re-open rate compared to other claims, depending on the specific company's guidelines for these claims. Members could allow for these claims if this occurs in material numbers when analysing terminations experience, for example these claims may need to be adjusted such that their termination date is set to be equal to the date they are paid up to.

Partial claims

The claimant might return to work part time or with alternate duties, in which case should a loss of income result from the ongoing 'disability', the benefits payable by the insurer might reduce or stop in line with the product terms. The level of benefits payable might vary over the lifetime of the claim as a result of the claimant's changed circumstances triggering different definitions within the policy terms and conditions.

Indexation

On the anniversary of the claim (typically measured from the payment start date at the end of the waiting period), or perhaps more frequently according to policy conditions, the benefit amount payable is increased if the policy has a claim indexation option or similar. The most common method of indexation is in line with the CPI, but it may also be a fixed percentage.

A.1.5 Ongoing Claims Management & Review

The claim is subject to ongoing management and review by the insurers' case managers and claims assessors to:

- Implement the claims management plan for the claim;
- Reassess return to work plans and approach, including rehabilitation and other support needs; and
- Determine whether the claimant continues to meet the relevant disability definition and therefore whether benefits should continue to be paid and at what level.

This process might involve the policyholder being requested to provide further evidence or information on a regular basis and having further medical tests at specified intervals. The process also involves claims managers actively working with claimants to improve their health

to enable them to return to work (or their normal duties). This might involve targeted rehabilitation therapy, which may be contracted by, paid for, or reimbursed by the insurer as allowed by legislation. Note that legislation limits life insurers' ability to reimburse and fund certain rehabilitative and supportive therapies and initiatives, especially those considered medical treatment costs.

A.1.6 Claim Closure

Recovery

The claimant might return to work full time (or otherwise not meet a relevant disability definition) in which case the insurer will stop paying benefits, with the last payment typically a pro-rated payment for the period the claimant did meet the relevant definition.

Death

The claimant might die in which case the insurer will stop paying regular income benefits (although a death benefit might be paid), with the last payment typically a pro-rated payment for the period which the claimant was alive.

Commutation

For some products (depending on the policy features), the policyholder might request (including having the option under the policy to request) consideration to commute their benefits once they have been on claim for a prolonged period of time. In other cases, this might be a proposal put forward by the insurer or arise from legal settlement. The insurer then pays a lump sum benefit to the policyholder and does not make further payments for that claim and the policy is typically cancelled. Prior notification and agreement with the reinsurer may be required. Cancelling cover, particularly for Group business, can be problematic if the insured does recover and returns to work at a future date and is then denied future cover.

Similar to the "Advance pay and close" situation, experience analyses need to clearly identify these cases, how the benefit payment is treated in the data and what the implicit claim duration impact to allow.

Re-opened claims

After a claim has been closed (due to recovery), the claimant might relapse and once more meet the disability definition. Most products allow a twelve-month period (often six months for shorter benefit periods) after the closure of the claim during which the claimant will not have to serve the waiting period again for a new claim due to the same or directly related cause as the previously closed claim. Relapse following this period might theoretically occur, but this would typically be treated as a new claim with a new incident date (and resultant serving of the waiting period).

Benefit Period Expiry

At the end of the benefit period (which might coincide with policy expiry), benefits are no longer paid by the insurer.

Experience analyses need to carefully distinguish between actual recovery (reflected in claim termination rates) and benefit term expiry (which should not).

A.1.7 Additional Considerations by Reinsurers

The underlying lifetime of a claim is the same with or without reinsurance. However, some process and data differences may require additional consideration by reinsurers when assessing experience. A non-exhaustive list of these is set out below:

- Inconsistency in data field definitions across ceding companies;
- Change in data definitions and processes by cedents over time;
- Additional notification process with the cedant;
- Whether claims that have reinsurer involvement may have different experience;
- Reinsurers may be able to cross-check a claim against the rest of their book;
- Data quality – for example not having the ancillary component explicitly or not receiving sufficient information on partials and offsets (these items can materially impact propensity to claim or remain on claim);
- Classification of re-opens relative to new claims may differ to the cedant's method.

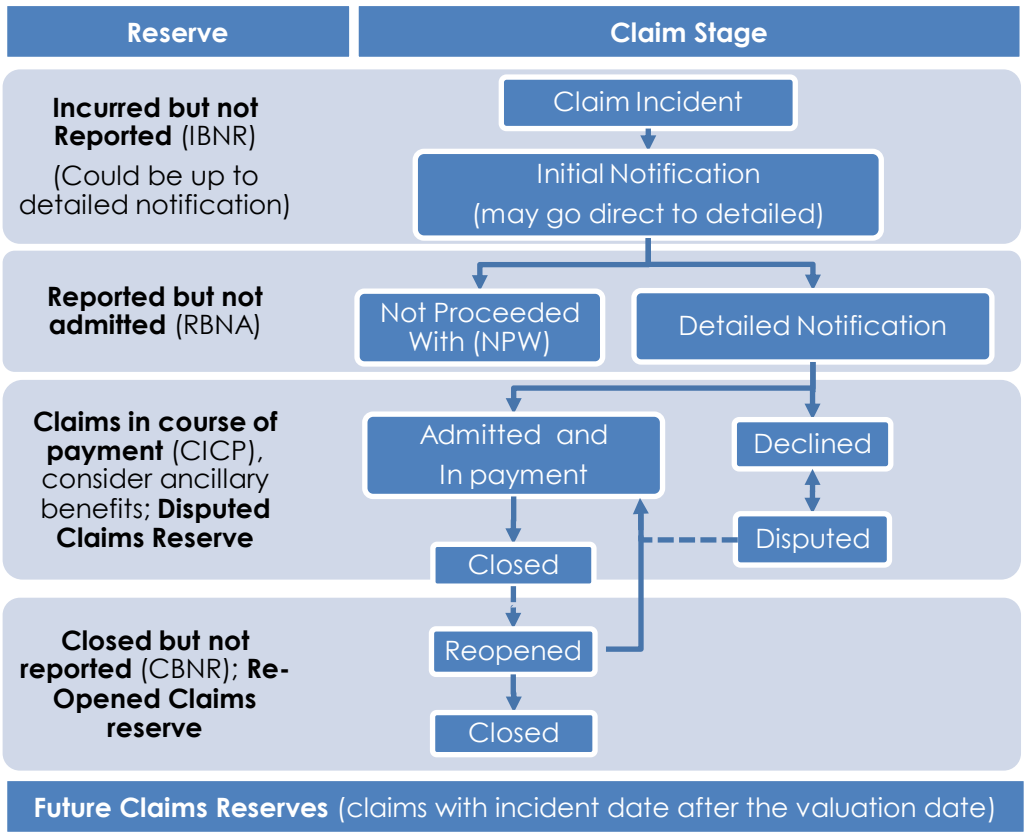
A.2 Reserving across the claim lifecycle

A.2.1 Reserves by claim stage

The following chart shows typical reserves that insurers hold for DI claims split by the stages of the claims lifecycle. Different benefits on the same claim might be at different stages of the claim lifecycle and may be treated accordingly. It is important that all claims costs over the life of a claim are reserved for without double counting or gaps.

The actuary needs to ensure that the actuarial reserving approaches align with, and are consistent with, provisions separately included in the accounting systems (e.g. provisions for accrued payments due or pending, reinsurance recoveries, etc).

Figure 2: Claims process



A.2.2 Incurred but not Reported (IBNR) Reserves

Prior to receiving sufficient information and forming a preliminary claims assessment, the insurer may have only limited information or may not know about a claim incident at all. IBNR reserves are held in respect of these claim incidents that have not yet been (fully or sufficiently) notified. This reserve could be calibrated to allow for all claims before the preliminary assessment.

A decision needs to be made as to the point at which an RBNA reserve (see below) is raised and the claims exposure ceases to be reflected in the IBNR and is included in the RBNA. This may be at the initial notification stage or only when a preliminary assessment has been made. The IBNR calculation needs to be consistent with this decision.

It is noted that IBNR reserves would normally include provision for future claims payments, third party costs (e.g. medical assessment costs, legal costs), premium waiver costs and internal claims management costs.

A.2.3 Reported but not Admitted (RBNA) Reserves

RBNA reserves are held in respect of claims that have been notified, but where no decision has yet been made to either admit, preliminary admit or decline. The calibration period would typically not overlap the period covered by the IBNR. Consideration could be given for potentially different decline rates for earlier vs later notified claims in the RBNA.

The RBNA calculation approach also needs to be consistent with CICP reserving, with additional allowance for expected declines. In addition to declines, allowance may be made for terminations between the valuation date and the end of the claim waiting period. The claim duration assumed may be more approximate per claim than used for the CICP given the lack of information available.

Special consideration needs to be given to RBNA claims where the valuation date is after the end of the waiting period. The Actuary could consider whether to include allowance for:

- Payments due from the end of the waiting period to the valuation date.
- Expected claim terminations from the end of the waiting period to the valuation date.
- Different rates of decline depending on what stage of claims assessment has yet taken place.

A review of historical experience of RBNA claims could indicate whether to include the above elements based on materiality.

As for IBNR, RBNA reserves would normally include provision for future claims payments, third party costs (e.g. medical assessment costs, legal costs), premium waiver costs and internal claims management costs.

A.2.4 Claims in Course of Payment (CICP) reserves

Admitted and In Payment

CICP reserves are held in respect of the expected future claims cost for those claims that are admitted into payment (or initial payments are being paid pending further assessment). It could allow for expected future closures (terminations) and could allow for an expectation that a proportion of closed claims will re-open and resume payment.

For larger portfolios, the CICP usually comprises a projection of expected future claim payments. The projected claim payments may allow for:

- Partial payments – some claimants may be receiving partial benefits as they have partially returned to work (and are earning some income). In other instances, claimants may not receive the full benefit amount e.g. if their combined insurances result in a higher replacement ratio than that allowed under the policy, or adjustments may apply due to some income offsets to the benefit payments. Some of these may change over time, for example as sources of offset income decline or as the claimant progressively returns to part-time work or relapses to full disability.

- Claim benefit amount - This might be less than the sum insured for indemnity benefits.

- Premium waiver – This is an implicit cost which could be explicitly included in the CICP if the "active lives" projection continues to project future premiums payable by the claimant.

- Claims expenses (If not reserved elsewhere). As for IBNR/RBNA, this would normally include provision for future third party costs (e.g. medical assessment costs, legal costs), and internal claims management costs. These two costs types are usually separately assessed and reserved for, and may have different patterns of incidence over time.

- As with RBNA, if the valuation date is before the end of the waiting period, consideration could be given to expected terminations in the waiting period. This could be seen as not being part of expected terminations, but rather these claims might only be seen as an incident if they reach the end of the waiting period.

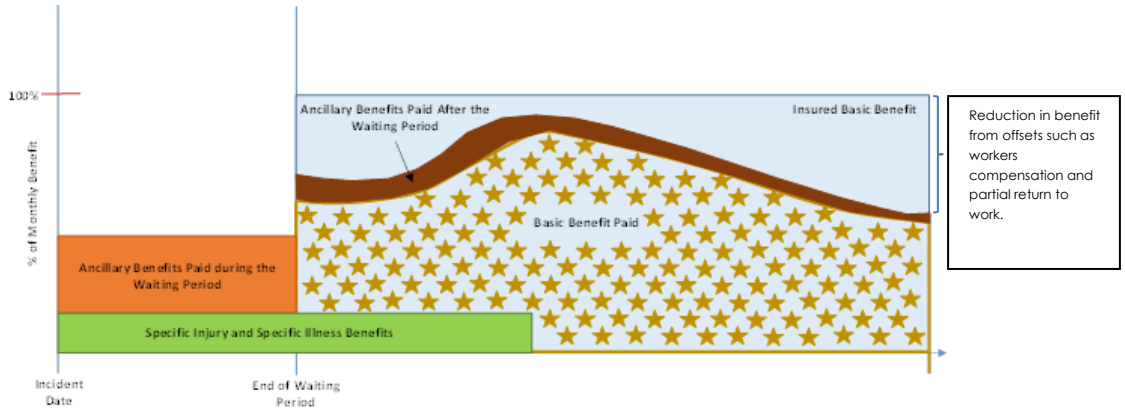
- Ancillary benefits – each ancillary benefit needs to be considered for assumption setting and approaches can range from a high-level loss ratio or high-level factor based on a driver, to inclusion in the full inception and recovery process depending on the benefit. The following needs to be considered when allowing for ancillary benefits in reserving:

    - All benefit outgo needs to be allowed for in assumption setting to ensure completeness and avoid double counting or gaps. Due to the high number of different ancillary benefits, this can be a common flaw in reserving. Ideally list all possible benefit outgo types and decide on how each will be treated (especially where the ancillary benefit replaces the normal monthly benefits);

    - When allowing for ancillary benefits, the timing of the ancillary payment needs to be considered carefully, especially where an inception and recovery process is adopted, in order to ensure no distortion.

Ancillary benefits may be paid both during and after the waiting period. Examples of ancillary benefits are bed confinement benefits, trauma recovery benefit, specific illness benefit, specific injury benefit, and accident option. See Appendix D for definitions of these ancillary benefits.

Figure 3: Components of the Claims Cost



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Disputed Claims reserves

These reserves relate to declined claims that have been disputed and which may convert to (re)admitted claims in the future.

Reserves might be based on a statistical approached based on analysis of past experience, or for smaller portfolios could be estimated for each claim based on the merits of the case, and/or for large single cases with key input from claims managers and legal professionals where relevant.

Increased lawyer involvement in claims and greater awareness through social media can limit the extent to which historical data, if available, is credible without allowance for trend changes.

A.2.5 Reopened Claims and Closed but not Reported (CBNR) Reserves

Reopened Claims reserves

Reopened claims reserves allow for the possibility that closed claims re-open. They can be calculated as the CICP reserve just prior to being closed multiplied by the probability of re-opening (which might differ by period since closing).

It is noted that consistent treatment between closing claims and re-opening reserves could avoid double counting.

CBNR Reserves

CBNR reserves could be calculated as a deduction to CICP reserves, allowing for the probability that some proportion of the claims currently in payment no longer meet the disability definition under the benefit at the valuation date and won't receive further payments. Triangle techniques can be used to estimate the typical delay between the final payment date and the claim closure date.

The reserve for claims not paid up to the valuation date (typically large for CBNR claims) might also be reduced in line with the reduction to the CICP reserve (which only accounts for future payments).

A.2.6 Other Reserves

Future Claims Reserves

Future claim reserves are calculated as part of the active lives policy liability. This reserve considers the present value claims cost of future claims and generally could need assumptions regarding the likelihood of claim in addition to termination assumptions. The timing of the definition of incurred date (when a claim is projected to be a claim) in the projection would typically be consistent with the calculation of the IBNR reserves.

Payment Due and Payments in Advance Reserves

A 'payments due' reserve (liability) and a 'payments in advance' reserve (asset) may be held relating to prior period accruals. Note previous observations above as to consistency with the accounting records treatments of these amounts.

Appendix B – Comparing experience investigations to the Financial Statements

As discussed in section 7.3, when assumptions are built up from the experience investigation, Members setting assumptions could compare that experience investigation with the claims experience in the AoP on the Financial Statements to check that any trends or observations are relatively consistent or explainable between the two sources.

Due to the complexity and ongoing nature of disability claim payments, is it often difficult to compare and reconcile the trends and outcomes seen in the experience investigation with claims experience in the AoP for an individual year. The table below highlights potential differences that could be considered in such a comparison.

#	Item	Description
1	Timing: recognition	The experience investigation may be by event date whereas the AoP will be by financial reporting date allowing for incurred claims.
2	Timing: frequency	The experience investigation might be out of date or rely on data that is a few months old whereas the AoP will usually be produced more frequently and be based on more recent experience.
3	One-off adjustments	The AoP might contain one-off or aggregate adjustments that may not be a feature of the experience investigation or may be muted in the experience investigation as a result of the typically longer analysis period. Corrections or one-off adjustments to claims cost in the Financial Statements may be one such cause of these differences.
4	Incidence & termination combined	The experience investigation might consider incidence and termination rate experience separately without combining the two to form a view on total claims cost. Whereas the AoP may not separate the incidence and termination experience or it may show the analysis in terms of present value of claims cost (rather than as incidence and termination rates).
5	Accounting Policy	Accounting policies might require a claims accrual upon notification (i.e. on RBNA) adjusting for potential declines differently to the experience investigation. In addition, accounting accrual dates could differ from notification dates and it could be useful to understand differences using claim notification dates from the individual claims data underlying the experience investigation.

#	Item	Description
6	Level of aggregation	The AoP and Financial Statements may not contain information at a sufficiently granular level for comparison with the experience investigation. Certain subsets of the business (e.g. specified injury benefits) might not be analysed separately in the experience investigation but will be included in the Financial Statements. Similarly, the Financial Statements will include all business and the experience investigation might only focus on material lines of business.
7	Assumption changes	Successive years of the AoP analysis may have been completed on different assumptions whereas the experience investigation is typically compared across all years on a single expected basis.
8	Different bases	Depending on the accounting method used, policy liability movements in the AoP may include claims cohorts with different risk and other accounting margins, different discount rates and locked in assumptions. Whereas, the experience investigation is typically complete on a single and often simpler expected basis.
9	Net or gross of reinsurance	Experience may differ depending on whether it is gross or net of reinsurance.

Appendix C – Allowance for trends and related topics in DI assumption setting

This appendix covers shifts in DI claims experience for reasons other than product terms or changes in the underlying demographic factors (e.g. age, sex, occupation, policy duration). They are primarily relevant for determining the levels of the assumptions, not the underlying shape. It covers both incidence and termination.

C.1 Types of systemic experience shifts

- **Trends** are a systematic change each year, over a period of years. The change may be represented by a linear function, though this is not a defining characteristic. Indeed, it is possible that trends may not be linear. The key question is whether there is sufficient certainty to justify a more complex trend function.

- **Step-shifts** represent a one-off change in the experience where there is no observed or expected reversion back to the previous level.

- **Temporary and Cyclic effects** are influences which impact experience for a few years (typically 3 years or less) but experience then reverts to its previous level. Economic recessions or booms can affect DI experience in this way, giving a cyclic character to experience over the longer term. There may also be true one-offs arising from causes which are expected to never return again. Between the "cyclic" and "true one-off" are "rare but repeatable" phenomena. These have typically occurred in the past and will occur again, but the period between occurrences is long, with most experience periods not having any influence from such phenomena. Possible examples are severe economic events (beyond normal cycles), pandemics, and a major disaster sufficient to affect a non-trivial portion of the policyowners.

- **Cohort effects for terminations:** These arise because the termination experience of a cohort of claims in a period is often not independent of the experience in prior or subsequent periods. For example, a drive to terminate a subset of open claims which requires some element of intervention to close, will result in higher than expected terminations for the subset during the period of the drive. However, for the periods prior to or after the drive, terminations for that cohort may well be lower than expected. Cohort effects can arise from any temporary effects on claims terminations.

C.2 Interpretation of Historic Experience

A mix of the above types of systemic experience shifts may be present in any experience period, on top of the pure random variability between periods. In addition, in a larger long-established portfolio, the experience will be often be a mix of different generations

and types of products. Before setting or reviewing best estimate assumptions it is necessary to interpret the available historic experience.

- It is essential to obtain as much of an understanding as possible of specific drivers of higher or lower experience in the various categories of experience.

- Discussion with heads of claims and other "hands-on" senior claims staff is essential. They can give a qualitative view of changes they have seen. They will also know of specific initiatives or issues in the claims department, with an indication of the effects on experience. The outcomes of the discussion may be documented, with that documentation agreed with the relevant claims staff and retained for reference for future investigations. Additional data collected in the claims function may also be of assistance.

- Economic data covering the experience period relating to unemployment, underemployment, real wages growth as well as consumer and business confidence, will help understand the contribution of the broader economic environment. An understanding of these characteristics by state and by major industry is also desirable, as economic performance is not always highly correlated between states and large industries in Australia. The mix of any DI portfolio will usually vary from the overall Australian mix. It is important that the economic indicators considered have sufficient relevance to (reflect the impact on) the insured population being analysed.

- Analysis of the experience by product, claims cause, occupation grouping, waiting period, age groups and other demographics will identify if the experience shift is universal or limited to one or more subgroupings. It is important to deal with credible subgroups only, if necessary, amalgamating base groupings together (e.g. blue vs white collar, rather than each occupation group, or sickness/accident for claims cause).

- When considering incidence, it is particularly important to do the analysis by cause groupings using the same cause groupings as are used in the termination assumptions.

- For DI terminations it is important to look separately at broad claims duration subgroups, rather than lumping all terminations together. The experience shifts and their drivers can vary significantly between different claims durations and claims causes.

- The experience measurement in the most recent year of the experience period is less certain due to a higher proportion of the claims in that period being IBNR.

- An understanding of experience over a longer period than the formal experience analysis period is desirable to help interpret the experience, especially longer term. This will help distinguish between temporary effects and more permanent shifts. Because of economic, cohort and other effects DI experience over a period of 3 or 4 years can often exhibit significant shifts or trends which then reverse. Use of a longer experience analysis period is preferable, but an alternative is to use previous years' experience reports going back further than the current experience analysis. For this latter alternative, differences of expected basis, method and data sources can make comparability between periods difficult, and judgement may be important.

- A comparison with industry experience over the period may give more statistical credibility and additional context to an individual company's results.

C.3 Setting Best Estimate Assumptions

Once the experience has been interpreted it is necessary to review or set best estimate assumptions.

- **Temporary, Cyclic and Cohort Effects**: Unless there is a desire to make specific short-term allowances in assumptions for temporary effects, where these are deemed to be affecting the experience then either:

    - The experience in the relevant years is excluded from the experience analysis used to support best estimate assumption or
    - The relevant levels of the experience could be adjusted up or down prior to conducting any trend or step-shift analysis or
    - No adjustment is made because the period is long enough and the exposure volumes sufficiently stable that the effects cancel each other out. Care is typically taken to ensure this approach does not lead to false trends or step-shifts.

    The approach used and adjustments made, may depend on the nature of the effects, the interpretations of experience and the actuary's views about how representative this experience period might be relative to the projection period over which the assumptions will be used.

- **Trends:** Establishing a trend (as defined above) requires either a large amount of experience data or a solid and rigorously supported reason for the trend, preferably both. If relying largely on the data, 3 years' worth of data is unlikely to be credible enough, though a step-shift may be appropriate as an alternative. Assuming a trend is established:

- It is necessary to take a view, within the experience period, when the trend started (the start year) and finished (the end-year). The start year may be the start of the experience period, or a later year. The end-year may be the end of the experience period or an earlier year.
- A trend-line or curve of the level of experience each year, from start- to end-years inclusive, could be fitted by a combination of judgement as well as mathematical methods. If the end-year is prior to the last year of experience, then the final point of the line/curve could be based on the whole experience from end-year to the end of the period. The same principle applies to the starting point of the line/curve if the start year is later than the first year of the experience period. Where this principle applies, either the start- or end-year point, or both, will be points of higher credibility than other points on the curve as more data underlies them. If the end-year equals the last year of experience then the end-year point will be a less credible data point, due to the larger proportion of unreported claims. All these relative credibilities could be part of the judgement in fitting the line or curve.
- If the trend-end-year is the last year of the experience period then it is necessary to take a view on whether the trend will continue and, if so, for how many years (trend extrapolation). If there is a solid understanding of why the trend is occurring, then it is easier to form and justify a view about extrapolation and how many years it should be. It is also important to separately consider the modelling and the potential mitigating effect of repricing rights.
- The level of confidence in extrapolating a trend needs to consider how the assumption will be used. For example, a deteriorating trend extrapolated for a significant period may lead to current period reserve and price increases that may turn out to be unwarranted if the trend does not persist.
- Assuming no extrapolation, the level of the assumption could be set as the final point of the trend-line or curve described above. If there is extrapolation then the assumptions are based on the level of experience in the trend-line up to the final year of extrapolation, remaining constant thereafter. However, if the trend appears persistent then that may result in optimistic assumptions.

- Step-shifts: This is an easier alternative to the full trend approach described above. The historical experience year in which the step shift is first deemed to occur is typically determined. This could be any year of the experience period, including the start or end-year. The best estimate assumption is determined based on judgement, having primary regard to experience in and after the deemed first year.

C.4 Relationship between incidence and termination assumptions

If a significant trend or step shift is proposed for incidence rates, then it may not be automatically assumed that the termination rates of the incremental extra (or lesser)

incidences will be the same as the whole portfolio. This could be taken into account when interpreting termination experience and finalizing termination assumptions.

C.5 Credibility and Statistical Considerations and Techniques

The Information Note: *Framework for setting life insurance best estimate assumptions* has appendices on "Analytical Tools and Techniques" and "Credibility Theory", including references for further reading. Larger DI books may have sufficient credibility to apply analytical/statistical techniques to incidence analysis. The same applies to early terminations, as only a minority of claims continue beyond 12 months.

Challenges to be aware of in applying the techniques to DI business are:

- Consistency of incidence and termination: The risk of inconsistency emerging between incidence and termination rates needs to be managed when designing the detailed application of the techniques.

- Incidence: DI has a large number of product categories and rating factors. There may be separate assumed incidence rates by cause of claim. If incidence experience is to be given high credibility leading to a change in assumption, careful consideration is necessary as to how the change is cascaded down to product categories, rating factors and claim causes as many cells will have low credibility. An example of such a cell might be 90-day waiting period, female, non-smoker, blue collar, 5-year benefit period, indemnity basis, accident type claims for ages 41-45. The cascading process may have regard to key parts of the portfolio or claims causes which have driven the experience incidence change, but should not result in spurious significant assumption changes for low credibility components.

- Termination: Termination rates for longer duration claims (more than 12 months) are much lower than early duration claims and their drivers continue to vary by claim duration. Their financial significance is much higher than their statistical significance so outputs of pure mechanical models would typically be treated with care. It is inappropriate to aggregate all the longer duration (>12 months) together in one A/E, as that will be dominated by claims terminating in year 2, giving year 2 experience too much weight relative to its financial significance. More insight can be gleaned by the level and shape of A/E's by claims duration. Credibility theory is most appropriate where there is no systemic pattern in the A/E's, and if applied the experience could be broken into relatively more homogeneous driver buckets. A further complication may be that the mix of claim causes in the insurer's portfolio can change over time because (i) incidence rates by claim cause may change and/or (ii) termination rates by claim cause can differ significantly. This may result in a significant delay between

experience first emerging in a claims duration "bucket" and the mix of claims by cause in that bucket stabilising.

- Trends, Step-shifts and Temporary/Cyclic effects present in the experience: Analytical/statistical techniques could be designed to recognise these effects. If credibility theory is being used, then either the priori basis is typically updated to allow for these effects, or the experience adjusted to remove some or all of them, so like is compared with like.

Appendix D – Examples of Ancillary Benefits

Type	Description
Bed Confinement Benefit [1]	"If you are totally disabled and under advice from a medical practitioner you are confined to bed for at least three consecutive days during the waiting period and a medical practitioner certifies that the continuous care of a registered nurse is required, we will pay you 1/30th of the Total Disability Benefit for each day you continue to qualify for this benefit, for a maximum of 90 days or until the end of the waiting period, whichever occurs first."
Trauma recovery benefit	An additional benefit of a set number of months of monthly sum insured triggered by a predefined set of trauma conditions. The treatment could be to include this as part of the normal inception / recovery assumption.
Specified Illness Benefit	This benefit is paid for a specified illness on diagnosis (irrespective of wait period and disablement). The ADI 2014-2018 table does not include this benefit however this could be priced or reserved for using trauma decrements from the lump sum standard table as a proxy due to the strong overlap in trauma conditions.
Accident Option[3]	"The insurer pays the monthly amount insured payable from the start of the waiting period if the life insured is diagnosed by a medical practitioner as being totally disabled within 30 days of an injury, and they are totally disabled for at least 14 consecutive days. The insurer will pay 1/30th of the monthly amount for each day." The ADI 2014-2018 table has 1-day accident rates in the incidence rate table and termination table, and Day 1 and Day 4 accident options have been included in the basic benefit.
Specified Injury Benefit[1]	"If the life insured sustains a specific injury during the period of cover the insurer will pay this benefit for the length of the specified payment period regardless of whether the life insured is totally disabled, needs ongoing medical treatment or is working. This benefit is payable during the waiting period." The ADI 2014-2018 table has specified injury explicitly separated from basic benefit incidence rates. The experience investigation treatment could follow the underlying table structure and apply the age rated incidence table.

[3] Example benefit wording taken from a PDS