

30 June 2016 Valuation Report



Department of Social Services

Final Report 2017



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Part I: Executive summary

1. Introduction

Background to this report

In its May 2015 Budget, the Commonwealth Government announced an intention to implement the Australian Priority Investment Approach to welfare in Australia. The development of this approach was one of the recommendations of the review of Australia's welfare system, *A New System for Better Employment and Social Outcomes* (the McClure Report), along with the broader recommendation for reform, to simplify the system and reward work. Given strong evidence that work is beneficial to individual wellbeing, a major objective of the Australian Priority Investment Approach is to inform policy settings and interventions that effectively help individuals with capacity to work, to do so.

The Department of Social Services (the Department) set up an Investment Approach Taskforce to implement the Australian Priority Investment Approach to social welfare with the aim of reducing welfare dependence, and improving the lifetime wellbeing of people and families in Australia.

PricewaterhouseCoopers (PwC), in conjunction with Data Analysis Australia (DAA) was engaged to undertake the actuarial analysis supporting the Australian Priority Investment Approach. This will involve four annual actuarial valuations of the Commonwealth's social security and income support system.

The first valuation was known as the 'baseline valuation', and estimated the total lifetime costs for the Australian population as at 30 June 2015. The baseline valuation was documented in our report, *Valuation Report 30 June 2015 Baseline Valuation* and was publically released by the Minister for Social Services on 20 September 2016.

This report documents the second actuarial valuation, which provides an updated estimate of the total lifetime costs based on information as at 30 June 2016, together with a range of information about the current and expected use of the welfare system for different segments of the Australian population.

Purpose of valuation and report

The purpose of the actuarial valuation is to underpin the Australian Priority Investment Approach, by informing decisions on the management of the welfare system that are effective in increasing the capacity of individuals to live independently of welfare; in addressing the risk of intergenerational welfare dependence; and in decreasing Commonwealth long term social security costs.

At the macro level the actuarial valuation can be used as a governance tool – to measure and monitor long term costs of the system and evaluate the effectiveness of new policies in improving financial and social outcomes. At the micro level it can provide information on the past experience and expected future cost of specific groups, to help inform targeted policy for people in these groups.

This report is intended to describe the method, assumptions and results of the valuation in relatively simple language, highlighting key features of the model and its outputs. We have also provided commentary on various insights developed through the valuation process. The report is not intended to be a technical document and does not provide details of matters such as detailed aspects of the model structure, statistical fitting techniques and validation processes.

Project governance

The project is being overseen by the Investment Approach Taskforce together with the Investment Approach Inter-Departmental Committee (IDC). As part of these governance arrangements the Department has established an Internal Reference Group to provide further guidance. The responsibilities for coordinating input from committee members and other Departmental experts rests with the Department.

These oversight bodies direct the scope of work, direct the development priorities for the model and provide guidance in relation to the basis used to establish model assumptions. In particular, the economic assumptions have been adopted after consultation with the Department and the IDC.

Scope of work

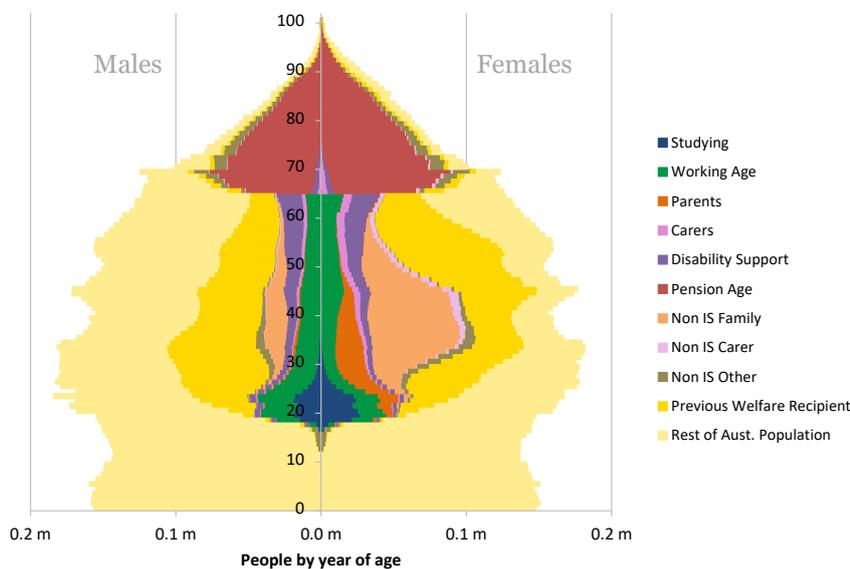
We have valued the payments for which the Department has policy responsibility as at 30 June 2016, together with child care payments which were included in the scope of the baseline valuation and have continued to be included for consistency although the portfolio responsibilities for child care transitioned to the Department of Education and Training on 21 September 2015.

The valuation is developed on the basis that currently legislated policy continues indefinitely. For example, future changes to increase the qualifying age for the age pension to age 67 have been allowed for (as these were already reflected in legislation at 30 June 2016), however we have not included the parental leave reforms currently being debated.

The valuation covers all future welfare payments to a closed population for the rest of their natural lives (which is capped at 110 years in the model). The population used in the valuation model includes all current Australian residents and any current welfare recipients residing overseas.

The demographic profile of this population and their welfare class at the valuation date is shown below.

Figure 1: Model population with class utilisation (June 2016)



This population pyramid illustrates a number of broad features of the welfare payment system, such as the way in which men and women access different supports at different stages of life, and the large proportion of the population at older ages who access the age pension.

2. Developments since the baseline valuation

Changes to the actuarial valuation model

The actuarial valuation model has been designed to provide the Department with a comprehensive and flexible platform that can be further developed over time. This platform includes the ability to generate results for the whole population, for sub-groups, for different scenarios and for different sets of assumptions. It provides the Department with the option of extending the model by including more data or refining it through the inclusion of more sophisticated assumptions as time progresses.

As noted in the baseline valuation report the intention is for the model to continue to be developed by PwC, in conjunction with the Department, over the years of PwC's contract. Model developments will serve to further refine the analysis and provide further insights through exploring the use of more data.

The priorities for model improvement were identified by the Department and a development plan for the 2016 valuation was agreed in conjunction with the Department and IDC. This resulted in a number of significant changes to the valuation model and an overview of these is provided in the remainder of this section.

The economic module

The valuation model design included an economic module which was not developed as part of the baseline valuation but has now been developed and included for the 2016 valuation.

This module has been used to understand the extent to which the macro-economic environment influences welfare utilisation and the extent to which the size and mix of current welfare recipients has been influenced by the economy. Its introduction facilitates the modelling of an explicit scenario for the future macro-economic environment in place of the implicit scenario used for the baseline valuation. It also allows us to explore the potential impact of different scenarios of future economic conditions.

The current version of the economic module focusses on the strongest relationships which have been identified, in particular those relating to utilisation of working age payments. Further development of the module may be considered in future, as a greater body of reference data becomes available for analysis.

Consideration of additional modelling variables

The baseline model used sophisticated assumptions in many areas – for example, whether someone is partnered or not, how many children they have and at what ages, their highest attained level of education, duration in class, and other important factors affecting their payment eligibility and risk profile. However, there are other person characteristics which are likely to influence people's welfare outcomes and a number of these have been introduced into the model at this valuation.

These additional class characteristic variables focus on the pre-retirement income support classes and the carer non income support class. They vary by class and include payment type, an employment earnings indicator, information on the medical condition of disability support pension recipients and for the care recipients of people receiving carer payments. Further variables for the ages of people receiving care and their relationships to the carer have been included for carer payment recipients and for the numbers of adults and children receiving care for those people receiving carer non income support payments. These variables are referred to as class characteristic variables.

As the model was further developed to include these additional risk factors the total lifetime cost would be expected to remain fairly similar, however it will differentiate more between groups of people with different characteristics and achieve greater accuracy in the average lifetime cost information and future welfare system use information for increasingly refined groups of people.

Through adding this additional functionality the valuation model which has been provided to the Department can be used to explore the different expected outcomes for groups specified using both the new modelling variables and those already included in the baseline valuation.

Refinements to other modules

Refinements have been made to a number of the other modules to improve the accuracy of the information developed through the valuation model. They include: separate modelling of rent assistance payments; extending the use of risk based assumptions to cover more assumption sets; recalibrating the demographic assumptions and fine-tuning the calibration processes for the class movement assumptions.

Changes to policy settings

The 2016 valuation reflects material changes to policy settings that have been legislated over the twelve month period from 1 July 2015 to 30 June 2016 inclusive. This has included a number of changes which are listed in Appendix A. Of these, the changes expected to have the biggest impact on the valuation are: the replacement of the Student Start up Scholarship with the Student Start up Loan; the cessation of the Large Family Supplement; the changes to FTB Part B and the changes to the child care payment eligibility criteria.

Changes to experience

The valuation has been developed with reference to the administrative data as at 30 June 2016 with the population information and all the main model assumptions being updated to reflect the latest experience.

Many elements of the experience would be expected to change little from one valuation to the next, or to show gradual trends as a result of changes to the external environment or to population demographics. Other assumptions will change more materially, most typically as a result of changes in policy settings or operational activities.

A key focus of the valuation analysis has been to identify and explore the changes in experience since the previous valuation. The valuation assumptions have been updated accordingly, so that they reflect the most up to date view available of the expected experience under current policy settings. Commentary is provided throughout the report on the main areas where changes have been observed.

3. Results

Total lifetime cost

The key result of the actuarial valuation is the total lifetime cost, which is defined at the valuation date as the net present value of future in-scope payments made to all people in the model population over the remainder of their natural lifetimes.

The total lifetime cost can be assessed for any group of people within the model population. In the discussion on the results we examine the total lifetime cost for the whole model population and for four groups of people in the starting population:

- Current welfare recipients - this includes any person who received a payment in the 2015/16 year.
- Recent exits – people who exited a welfare recipient class in the last three years. This is people who would be assigned to one of the welfare recipient classes (classes 1-9) at 30 June 2013, 30 June 2014, or 30 June 2015 but do not fall into one of these classes at 30 June 2016.
- Older exits – other people who are known to have previously received a payment
- Rest of the Australian Population – the remainder of the model population.

Future migrants and unborn children are not included in the estimate of total lifetime cost, but will appear in future valuations once they migrate or are born, and at that time will contribute to an increase in the total lifetime cost.

Average lifetime cost

For any group of people the lifetime cost can be considered in terms of the number of people in the group and the lifetime cost per person. Through this report we use the term **average lifetime cost** to refer to the per person future lifetime cost for a group of people.

Note that while the model does simulate the lifetime trajectory of each individual, it is only intended that results ever be considered for a similar group of individuals – either in total or on average for that group.

Lifetime cost results by class

The total lifetime cost for the model population is estimated to be **\$4,514 billion** as at 30 June 2016, in respect of the **24.2 million** people included in the model population. This is a substantial and somewhat uncertain figure, but does lend itself to longer term thinking about the dynamics and cost of the welfare system; it can be considered a benchmark against which the potential impact on the total lifetime cost of policy changes can be assessed.

Further, changes in the numbers of people in each class and in the lifetime costs can be used to help understand the need for policies to support groups in the population and to help understand the effectiveness of such policies.

The following table summarises some key figures underpinning this figure, by the sub groups discussed above and by class:

Table 1: Summary of key valuation results (30 June 2016 valuation)

Population segment	Number in starting population	Average age	Lifetime cost (\$bn)	Average payment in 2015/16 (a)	Average lifetime cost (\$'000) (b)	Ratio = (b) / (a)	Expected proportion of future lifetime in IS classes
Current welfare recipients							
- Studying payment recipients	390,207	24	82	8,600	210	24	41%
- Working age payment recipients	1,317,538	39	401	11,300	304	27	61%
- Parenting payment recipients	436,585	33	207	29,700	475	16	64%
- Carer payment recipients	271,541	51	119	26,800	438	16	85%
- Disability support pensioners	781,816	50	352	22,100	450	20	96%
- Age pensioners	2,550,939	76	518	17,100	203	12	96%
- Family non IS clients	1,553,941	40	301	5,600	194	35	40%
- Carer non IS clients	200,678	51	41	6,900	206	30	44%
- Other non IS clients	543,327	54	74	2,800	137	49	40%
<i>Total current welfare recipients</i>	<i>8,046,572</i>	<i>53</i>	<i>2,095</i>	<i>13,800</i>	<i>260</i>	<i>19</i>	<i>60%</i>
Previous welfare recipients							
- Exited 1-3 years	1,418,858	40	242	n/a	170	n/a	41%
- Exited 4+ years	2,767,739	46	411	n/a	148	n/a	40%
<i>Total previous welfare recipients</i>	<i>4,186,597</i>	<i>44</i>	<i>653</i>	<i>n/a</i>	<i>156</i>	<i>n/a</i>	<i>41%</i>
Rest of Australian resident population							
- Rest of Australian resident population	11,929,432	28	1,766	n/a	148	n/a	35%
Australian resident population	24,162,601	39	4,514	n/a	187	n/a	42%

Notes:

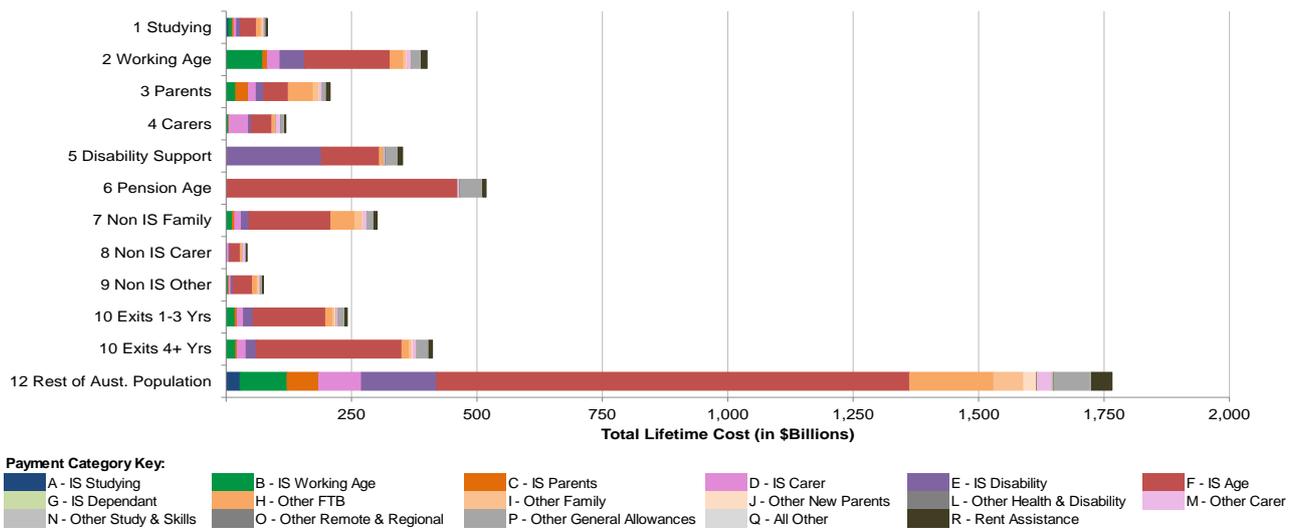
1. The average payment in 2015/16 is understated owing to the data maturity issues with FTB and family payment data. This has a particular impact on the average payments for people in the family non IS and other non IS classes; we would expect these amounts to ultimately be larger than the figures shown.
2. Exited 4+ years refers to previous welfare recipients who have exited in the past 4-15 years

The total lifetime cost represents a multiple of over 40 times the total amount of 2015/16 in-scope payments, which was \$111.5 billion. Such a multiplier is perhaps not unreasonable given that we have included the age pension in the valuation, which a significant proportion of the model population are expected to receive in the future for many years post retirement.

The table shows the contribution of each class and population group to the total lifetime cost, which reflects the number of people in that class and their average lifetime cost. The average lifetime cost for people in each class is driven by the probability of an average person in that starting population entering, remaining in or leaving the system in each future year; combined with the type and amount of payments they are likely to receive whilst they are active in the system.

Unsurprisingly, the current welfare recipient class with the largest total lifetime cost is age pensioners, owing to the number of people in this class and the fact that once in that class, most people remain there for the rest of their lives. Furthermore, the projected future cost of age pension and related payments for current welfare recipients is a significant component of the lifetime costs for all other classes. This is shown in the graph below, which further splits the lifetime costs by class shown in the above table, into the 17 payment categories that we have included in the model.

Figure 2: Composition of lifetime cost (\$billion) by welfare class and payment category



Note: Exited 4+ years refers to previous welfare recipients who have exited in the past 4-15 years

We have further developed the information provided for each class to include more information in relation to the number of years for which we expect people to receive some income support payments, some other payments or no payments.

Note this duration measure captures information on welfare system use over each year; it is not a measure of the length of time or number of fortnightly payment periods spent in receipt of payment.

Table 2: Summary of duration results (30 June 2016 valuation)

Population segment	Expected future lifetime (years)	Proportion of years receiving some income support payments	Proportion of years receiving some non income support payments only	Proportion of years receiving no welfare payments
Current welfare recipients				
- Studying payment recipients	67	41%	10%	49%
- Working age payment recipients	49	62%	6%	32%
- Parenting payment recipients	57	64%	11%	25%
- Carer payment recipients	37	85%	4%	11%
- Disability support pensioners	34	96%	1%	3%
- Age pensioners	15	96%	1%	3%
- Family non IS clients	51	40%	17%	43%
- Carer non IS clients	39	44%	26%	30%
- Other non IS clients	36	40%	23%	38%
<i>Total current welfare recipients</i>	<i>37</i>	<i>60%</i>	<i>10%</i>	<i>29%</i>
Previous welfare recipients				
- Exited 1-3 years	50	41%	8%	51%
- Exited 4+ years	44	40%	8%	52%
<i>Total previous welfare recipients</i>	<i>46</i>	<i>41%</i>	<i>8%</i>	<i>52%</i>
Rest of Australian resident population				
- Rest of Australian resident population	62	35%	9%	56%
Australian resident population	51	42%	9%	49%

Note: Exited 4+ years refers to previous welfare recipients who have exited in the past 4-15 years

As can be seen current income support recipients are expected to spend a far greater proportion of their future lifetimes receiving income support and this is especially so for recipients of Carer payment, Disability support pension and, unsurprisingly, the age pension.

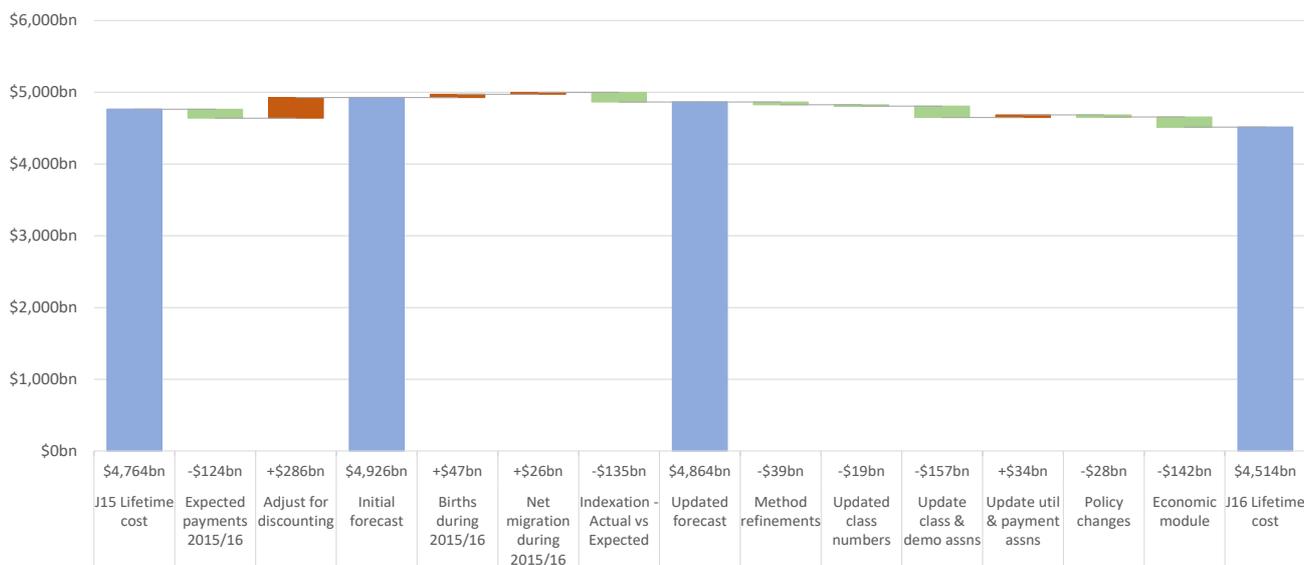
The expected future durations on income support for Students and people in the non income support classes are broadly similar and lower than for other income support recipients, but somewhat higher than those for people who have not received any welfare payments over the time period for which we have data.

4. Changes in overall lifetime cost

The assessment of total lifetime cost has reduced from **\$4,764 billion** at 30 June 2015 to **\$4,514 billion** at 30 June 2016. This is a reduction of **\$250 billion** reflecting that the changes arising in our updated assessment have more than offset the effects of the increase in the population and inflation.

The following chart illustrates how we expected the lifetime cost result to develop based on the assumptions used in the baseline valuation and the reasons for the difference between this forecast and our updated lifetime cost assessment.

Figure 3: Explanation of change in lifetime cost



The figure shows these movements in three stages which are discussed in turn below.

Initial forecast

As part of the work undertaken for the baseline valuation we provided a partial forecast of the expected future lifetime cost at the 2016 valuation of **\$4,926bn**. This forecast provided information about what the result would be if the actual experience over the last 12 months was exactly in line with all the assumptions made for the baseline valuation and there were no changes to the valuation assumptions.

The initial forecast was partial in that it only included information for the individuals who were part of the 2015 valuation population and expected to also be part of the 2016 valuation population. A complete forecast would need to include the full 2016 population, adding records for newborn children and those migrating into the country and removing records for those emigrating.

Updated forecast

As the first step of understanding the change in the lifetime cost result we have updated the initial forecast to take into account information on births during the 2015-16 year, the changes in population at other ages based on the net migration and the effect of indexation of payments being lower than expected over the year and a downwards revision of future indexation.

The impact of births and net migration are to increase the lifetime cost by \$47bn and \$26bn respectively.

The actual indexation over the year has been lower than expected and so allowance for this has acted to reduce the lifetime cost by around \$135bn. This results in an updated forecast of **\$4,864bn** which provides a benchmark to which the 2016 valuation result can be compared.

Further changes in the assessment of the June 2016 lifetime cost

The 2016 lifetime cost of **\$4,514bn** is a reduction of **\$350bn** from the updated forecast. This reduction arises as a result of a combination of changes which influence the valuation result. They include:

- Differences between the actual and expected experience over the 2015-16 year. This influences the number of people in each class at 30 June 2016.
- Revisions to the valuation model assumptions which reflect:
 - Updated information on the actual experience, such as changes to the expected rates of movement between two classes or changes to the average amount of payments being received when people are in a particular class.
 - Updated information on external drivers of welfare utilisation, such as future unemployment rates
 - Changes to the policy settings
- Changes to the valuation model which are independent of the underlying experience and reflect the methodology improvements implemented at this valuation.

Figure 3 illustrated how these factors have influenced the result and further explanation is provided below.

- **Method refinements:** At this second valuation of the welfare system we have implemented a number of changes to refine the valuation model. These include the changes to the payment category definitions, the enhancements to add class characteristic variables into the model and refined approaches to developing many of the underlying model assumptions. The overall effect of these changes is a lifetime cost reduction of **\$39bn**.
- **Updated number and profile of people in each class (compared to the expected position):** This allows for the number and profile of people in each class differing from what was expected based on the June 2015 valuation. In particular there were slightly fewer people than expected in some of the income support classes. This experience resulted in a decrease in the lifetime cost of around **\$19bn**.
- **Updates to class and demographic assumptions (\$157bn decrease):** This component of the change reflects the updates made to the partnering, children and educational attainment assumptions and those made to the class movement assumptions. These updates reflect the latest experience captured in the administrative data and also reflect the explicit consideration of the impact of the new modelling variables on the class movements.

The impacts of the demographic and class movement assumption sets are closely inter-related owing to the iterative nature of the model, with changes in person characteristics influencing class movements which in turn influence expectations of the class movements the following year. The main factors underlying the changes from these assumptions are:

- Around a \$40bn decrease from updating the demographic assumptions to reflect more recent experience. This included a decrease in the projected proportion of women with children, resulting in decreased projected numbers of people in Class 3 Parents and Class 7 Non IS Family.
- Around a \$70bn decrease from changes to entry rates of which the most significant change was a reduction in the assumed entry rate into Class '2 Working Age'.
- Other changes in the assumptions for movements from the active classes, including a decrease in the assumptions for the number of subsequent transitions into Class 4 Carers, Class 5 Disability Support and Class 8 Non IS Carer (around a \$40bn decrease).

The changes to the underlying assumptions are reflective of recent experience.

- **Updates to utilisation and payment assumptions:** Based on recent experience, there has been an increase in average payment sizes outside of changes which can be explained by movements in indexation. This may suggest that a higher proportion of welfare recipients have been receiving payments for the full year (rather than for just part of the year). The estimated impact of this is an increase in the lifetime cost of **\$34bn**.
- **Policy changes:** The reduction of **\$28bn** reflects the changes in policy settings which have occurred over the past year. These are discussed further in the report.

- **Economic module:** the economic module is newly introduced at this valuation. The module itself has minimal impact on the valuation result, however in conjunction with introducing the module we have changed the assumption of the long term unemployment rate from an implicit assumption of being a continuation of recent experience, which has been around 6%, to an explicit assumption of a 5% rate. This suggests entries to the welfare system in future years will be lower than assumed for the baseline valuation and exits will be somewhat higher. The effect of this change is a lifetime cost reduction of **\$142bn**.

5. Changes in class results

The changes seen do not impact on people in each class in the same way. For instance, the reduction in future entry rates into the Working Age class has a much greater impact on people not currently receiving welfare than on current disability support pension and aged pension recipients.

Furthermore, when new predictive variables are introduced to the model the impact is typically fairly neutral for the full population. However the new variables will result in more differentiation between those who are expected to have higher persistency in the welfare system and those who are expected to have lower persistency in the welfare system. The addition of the new variables this year has led to improved identification of groups within some of the income support classes who are projected to have higher persistency in the welfare system and this has led to increased lifetime costs for these classes. Conversely the new variables have also resulted in better identification of the groups of the population with lower expected persistency in the welfare system and a reduced lifetime cost for the non-income support and non-welfare recipient classes.

The following table provides a summary of the changes in the numbers of people in each class and the changes in average lifetime cost for each class.

Table 3: Summary of changes in lifetime cost by class

Population segment	June 2015 population	June 2015 Average lifetime cost (\$'000)	June 2016 population	June 2016 Average lifetime cost (\$'000)	Change in population (%)	Change in Avg. lifetime cost (%)
Current welfare recipients						
- Studying payment recipients	391,568	247	390,207	210	-0.3%	-15.1%
- Working age payment recipients	1,301,746	315	1,317,538	304	1.2%	-3.5%
- Parenting payment recipients	432,318	441	436,585	475	1.0%	7.5%
- Carer payment recipients	265,459	411	271,541	438	2.3%	6.5%
- Disability support pensioners	812,903	416	781,816	450	-3.8%	8.1%
- Age pensioners	2,495,162	203	2,550,939	203	2.2%	0.0%
- Family non IS clients	1,546,834	221	1,553,941	194	0.5%	-12.3%
- Carer non IS clients	199,035	213	200,678	206	0.8%	-3.1%
- Other non IS clients	561,012	155	543,327	137	-3.2%	-12.0%
<i>Total current welfare recipients</i>	<i>8,006,037</i>	<i>265</i>	<i>8,046,572</i>	<i>260</i>	<i>0.5%</i>	<i>-1.8%</i>
Previous welfare recipients						
- Exited 1-3 years	1,351,179	200	1,418,858	170	5.0%	-14.7%
- Exited 4+ years	256,004	160	2,767,739	149	8.1%	-7.2%
<i>Total previous welfare recipients</i>	<i>3,911,220</i>	<i>174</i>	<i>4,186,597</i>	<i>156</i>	<i>7.0%</i>	<i>-10.3%</i>
Rest of Australian resident population						
- Rest of Australian resident population	11,949,332	164	11,929,432	148	-0.2%	-9.8%
Australian resident population	23,866,589	200	24,162,601	187	1.2%	-6.4%

Note: Exited 4+ years refers to previous welfare recipients who have exited in the past 4-15 years

Changes in numbers of people in each class

The numbers of people within the income support classes has grown slightly over the year, but is less than the overall population growth. Within this the experience varies considerably by class. The numbers of people in the aged pension and carer payment classes have both grown and this was in line with our previous expectations (reflecting past experience and population demographics). Conversely the number of disability

support pension recipients has reduced with reduced entries to this class, most likely as a result of the tightening of the eligibility requirements.

The numbers of people in the Studying, Parenting and Working Age classes are close to those seen last year. The experience for the Working Age class is particularly interesting as the numbers had been expected to grow over the year, with expected entries exceeding expected exits based on the past entry and exit experience in conjunction with the population demographics. The actual increase to the numbers of people was lower than these expectations with both the number of entries being slightly below expected and the number of exits being slightly higher. Further explanation of the reasons for the change in numbers of people in each class is provided in section 6.5.

Changes in average lifetime cost

There have been changes in average lifetime costs in the range -15% to +8% across the classes, with most classes seeing some reductions, in line with the overall lifetime cost movement, but with increases for people in the Parenting, Carer and Disability Support Pension classes and no change for the Age Pension class.

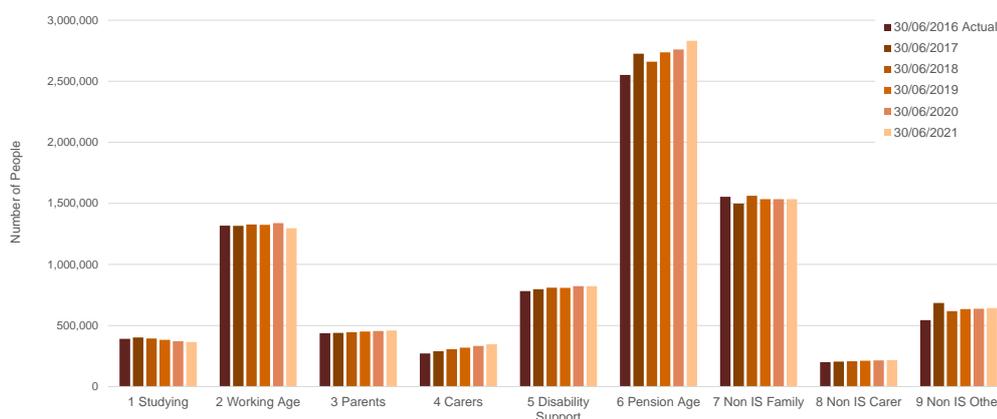
The factors behind these changes are discussed in sections 8, 9 and 10 for each class in turn. Some themes emerge:

- There are greater reductions for classes where people are currently not receiving welfare. This reflects the reductions to entry rates and lower long term unemployment assumption, which also serves to reduce the effective future entry rate.
- There are greater reductions for classes where people currently receiving welfare have a higher likelihood of exiting income support classes to either the non income support or non welfare classes in future. They also have a reduced likelihood of re-entering the system in future years.
- The inclusion of more variables in the model, together with more refined modelling has led to an improved ability to differentiate between the higher persistency and lower persistency subgroups within the population. This has tended to increase the assessments of lifetime cost for the classes which already had higher average lifetime costs and reduce them for other classes.
- The impact of new policy changes made over the year has been relatively minor, with many of the areas where recent changes are impacting the experience already considered in the baseline valuation.

6. Forecasts

The chart below shows the expected numbers of people in each active welfare class in each of the next 5 years.

Figure 4: Actual and Projected numbers of people in each active welfare class



Notes:

- The actual numbers will be slightly higher than this as the population is expected to grow through migration and births. Over this 5 year timeframe migration will have the bigger impact as most people only enter the payment system in their own right in their teenage years.
- Consequently the Department should use this information with care and consider making adjustments for the undercount before using them for purposes such as planning or budgeting.

The changing age profile of the population is a big driver of these forecasts with the expected growth in the number of age pensioners being the most notable feature. The number of people in the carer's class are also forecast to grow, again reflecting the ageing population.

7. Model sensitivity, use and limitations

Model assumptions

Many of the assumptions underlying the actuarial valuation are developed by considering patterns of past use of the welfare system. In some cases the past experience has been volatile and in others the experience has trended from year to year, most likely as a result of policy changes. Some policy changes are recent and not fully reflected in the observed experience; people may also behave differently in the future than they have in the past.

These considerations mean that the assumptions are inherently uncertain, and the actual future experience may differ from that modelled. This is particularly so when considering assumptions relating to experience far into the future. One example is the future trends in age pension entry and payment, and setting the probability that someone who either is or is not in the system now at age 25, will eventually go on to age pension in 40+ years' time. Other examples relate to the future macro-economic environment and the assumptions made for the long run inflation, discount and unemployment rates.

The long term nature of the lifetime cost results means they are highly sensitive to some of the assumptions, as quantified in section 7.5. For example, a reduction in the assumed discount rate from 6% (which has been adopted for the baseline valuation) to 5%, would add around \$1,600 billion to the total lifetime cost. The results are also quite sensitive to indexation assumptions, long term unemployment rate assumptions and to the mortality rates selected. For instance, we have assumed mortality improvements in line with long term forecasts for the population. These have the effect of increasing the assessed lifetime costs by around \$600 billion compared to a scenario where no improvement is adopted.

Model use and limitations

As well as understanding what the model can do, it is important to bear in mind what the model is not intended to do. Essentially, it is a tool for understanding the long term impact of decisions made today and in the future, at a fairly high system level, and for groups of interest. It is a dynamic model that projects a limited number of factors over a long time period, taking into account how the population will change over that time and considering uncertainty. This contrasts with static models that quantify, at a much more detailed or precise level, the overnight impact of decisions or changes on today's population. The models can and should work in tandem.

Further, at this stage in its development, the actuarial model is quite financially-focussed. Although future welfare outcomes may be a proxy for underlying employment and health outcomes they have a limited ability to capture the information needed to explore people's holistic life outcomes. An important aim of the investment approach, supporting the mission of the Department, is to positively impact the lifetime wellbeing of people and families in Australia, as well as improve the long-term sustainability of the welfare system. It will therefore be important, in using the actuarial model to develop interventions, to adopt a framework that considers not just the lifetime cost information generated by the valuation model, but also costs and benefits that are beyond the scope of the model.

In particular, as well as outputs from the model, in developing potential policy interventions it will be important to consider:

- Short term impacts over the budget forecast period, as determined by detailed overnight costing models
- Broader costs and benefits to other parts of the system, using more traditional economic approaches such as cost/benefit analysis
- Qualitative impacts on people's lives and their lifetime wellbeing

It will also be important that the actuarial valuation model is used by the Department to identify policy priorities in a systematic way, in conjunction with appropriate expertise and dovetailing with existing policy and investment frameworks. The actuarial valuation model results should be validated in the context of broader qualitative evidence, wellbeing measures, existing policy evaluation frameworks and expertise.

8. Groups of interest

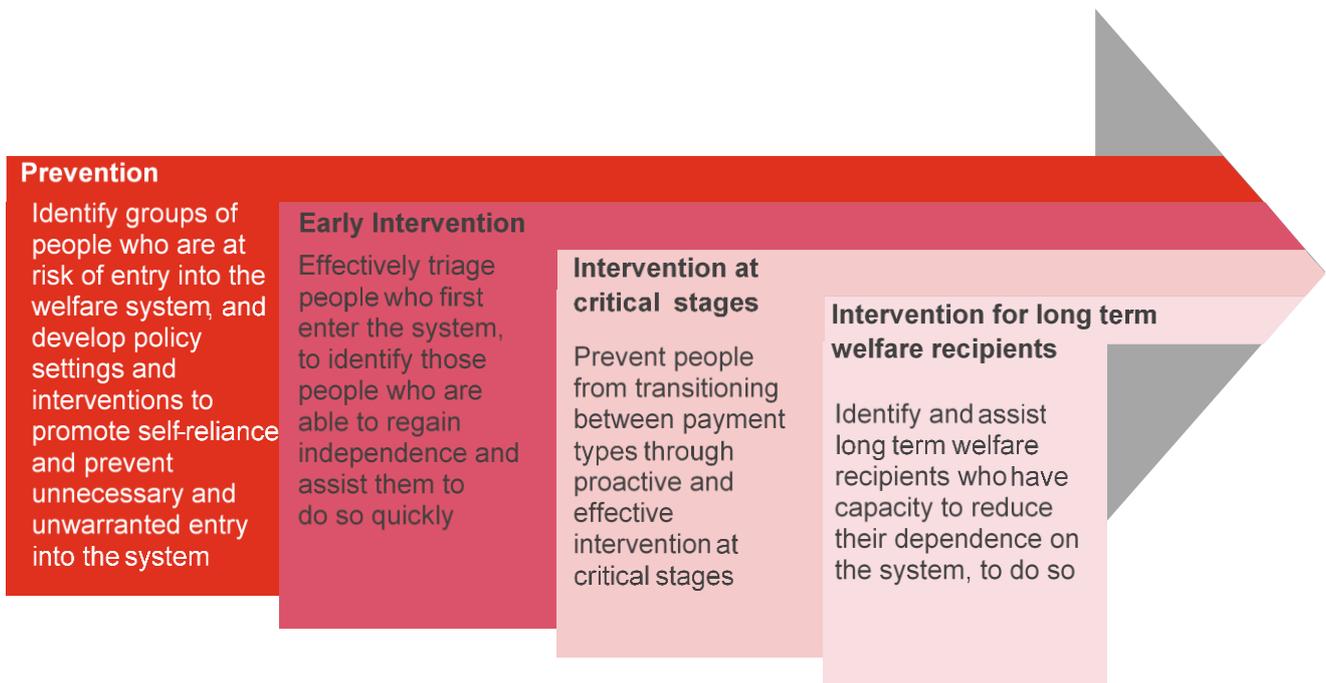
The intention of the Australian Priority Investment Approach is to ensure funding is directed towards evidence based policy interventions which increase the chances of sustained employment and self-reliance. Over time, this may include ceasing policy settings or interventions that are shown not to reduce the lifetime costs of welfare for particular groups; introducing policy settings or interventions that encourage self-reliance for particular groups; or investing in more tailored and effective policy settings or interventions for individuals and families who are identified as being most at risk of long-term welfare dependency.

While the total lifetime cost results for current welfare recipients are interesting and provide a useful framework for measuring the impact of future changes at a macro level, they are generally quantifying fairly broad and well-known features of the system rather than introducing new insights. The more interesting question is: what are the factors that can identify one group of people as being likely to leave the system quickly and another to remain on benefits for a long time?

A key function of the valuation model is to provide the ability to quantify lifetime costs for groups with similar characteristics. This information can then be used to identify “groups of interest”, who have relatively high lifetime costs, but where, with more effective policy settings or effective intervention (particularly at welfare entry and transition points), those costs could be reduced and the lifetime wellbeing of the people in the group improved. These groups are candidates for the application of the investment approach.

The following framework for considering these groups and developing interventions has been adapted from the workers’ compensation field, which shares the overarching objective of assisting people with capacity to work, to do so.

Figure 5: Intervention framework



Initial groups of interest

Our baseline report identified some groups worthy of more detailed exploration, based on these criteria and subsequent work, the Department identified three priority groups of interest. We have explored these groups further in section 13, providing a summary of the people within the population who would fall into the group and updated information on their expected outcomes.

Whilst there have been changes to the average lifetime cost results at a class level, the updated information for these three priority groups reaffirms their high relative average lifetime cost and that many of the people within these groups are expected to receive income support payments over the majority of their future lives.

Further groups of interest

The groups of interest identified through the baseline valuation are not exhaustive and it is anticipated that further groups of interest will be identified or existing groups modified or narrowed subsequent to the 2016 valuation.

The introduction of new class characteristic variables into the model provides the ability to further distinguish which groups of people are more likely to have high future welfare dependence. For instance, the payment type and employment earnings indicator can be used to develop information about which groups of students are more likely to transition from studying to other forms of welfare support over their lifetime (with high lifetime cost), rather than exiting the Studying class and remaining out of the system for the remainder of their lifetime (with low lifetime cost).

The statistical analysis which underpins the risk based assumptions demonstrated that all the class characteristic variables had some significance in differentiating people's likely outcomes. In particular, the employment earnings indicator provides additional insights with those people without employment earnings expected to have a higher future lifetime cost than those with earnings.

The valuation model is able to be run for any group of people of sufficient size and homogeneity and the model outputs include a range of charts that are available by age, gender and other characteristics. This enables the expected experience for a group to be examined in more detail.

As part of this valuation report we have examined each class in more detail with the results and relevant charts being shown in sections 8, 9 and 10. We anticipate that the Department will build on this analysis over the coming months and use the valuation model to explore the outcomes for further potential groups of interest.

Ultimately, any further groups of interest will be selected by the Department.

9. Other insights

In addition to the results shown above, helpful information and insights can be gleaned from the statistical analysis underlying the model, the model outputs themselves and from exploration of the historical data. These include:

- Forecasts of numbers of welfare recipients expected to enter and leave the system, or move through different welfare classes, against which subsequent experience can be monitored
- Information on the groups of people within the population who are receiving welfare payments
- Interesting trends or features of the data

The report highlights some of these insights throughout the results chapters and in section 14.



Part II: Valuation results

1 Introduction

1.1 Background

In its May 2015 Budget, the Commonwealth Government announced an intention to implement the Australian Priority Investment Approach to welfare in Australia.

The Department of Social Services (the Department) has set up an Investment Approach Taskforce to implement the Australian Priority Investment Approach to social welfare with the aim of reducing welfare dependence, and improving the lifetime wellbeing of people and families in Australia. PricewaterhouseCoopers (PwC), in conjunction with Data Analysis Australia (DAA) has been engaged by the Department to undertake the actuarial analysis supporting the Australian Priority Investment Approach. PwC will undertake four annual actuarial valuations of the Commonwealth's social security and income support system.

The first or 'baseline' valuation estimated the total lifetime costs for the Australian population as at 30 June 2015.

This report documents the second valuation, undertaken as at 30 June 2016. It provides an updated assessment of the total lifetime costs for the Australian population and reflects changes to the population size and demographics, together with changes to payment structures and current and future projected welfare system utilisation.

1.2 Purpose of the valuation

The purpose of the actuarial valuation is to underpin the Australian Priority Investment Approach ("the investment approach"), by informing decisions on the management of the welfare system that are effective in increasing the capacity of individuals to live independently of welfare; in addressing the risk of intergenerational welfare dependence; and in decreasing Commonwealth long term social security costs.

At the macro level the actuarial valuation can be used as a governance tool – to measure and monitor long term costs of the system and evaluate the effectiveness of new policies in improving financial and social outcomes. At the micro level it can provide information on the past experience and expected future cost of specific groups, to help inform targeted policy for people in these groups.

The intention of the investment approach is to ensure funding is directed towards evidence based policy interventions which increase the chances of sustained employment and self-reliance. Over time, this may include ceasing policy settings or interventions that are shown not to reduce the lifetime costs of welfare for particular groups; introducing or strengthening policy settings or interventions that encourage self-reliance for particular groups; or investing in more tailored and effective policy settings or interventions for individuals and families who are identified as being most at risk of long-term welfare dependency. A key output of the valuation is therefore to quantify lifetime costs for groups with similar characteristics, to inform evidence-based decisions regarding policy settings and potential interventions for these groups.

The actuarial analysis underpinning the investment approach draws on actuarial techniques that were developed for work within the insurance industry and that have successfully been applied in contexts such as injury schemes, and other social policy areas. In the insurance context it is recognised that the long term nature of the commitments made under many insurance contracts make it challenging to obtain a good understanding of an insurer's financial position. The role of actuaries in valuing insurance liabilities is now a well-established statutory requirement. Such valuations of insurance liabilities help quantify the size of claims reserves needed by the insurer and help ensure the financial solvency of the insurer.

For the Australian social security system there is no requirement to undertake a valuation for financial reporting purposes and the future cost of the system is not a technical or accounting liability, but rather the present value of a payment stream that will be funded out of future revenue. This is an important point, as actuarial valuations in other contexts, such as general or life insurance, injury schemes, or defined benefit superannuation funds, are subject to a range of requirements and standards that do not apply in the social security system context. Furthermore, the order of magnitude of the Commonwealth's social security system is far greater than is the case for most actuarial valuations conducted in Australia.

The actuarial valuation provides a longer term perspective of the financial commitments implicit in the current system and provides information on:

- The future cost of the system (lifetime cost).

- How the different payment types (programs) contribute to this overall cost.
- Which factors drive the overall lifetime cost and annual expenditures.
- How the cost is changing and a view as to the financial sustainability of the system.
- The impacts of changes, including: demographic changes, policy changes, economic changes.
- How different groups of people within the system contribute to the cost.
- The factors which explain why some groups are more or less costly than others.

1.3 Scope of valuation

The scope of the valuation can be considered in terms of:

- the payments to be included (covered in section 3.2)
- the people for which those payments are included (covered in section 6), and
- the time periods to be included (see below).

The valuation includes all payments made to people in the in-scope population for the period starting from the valuation date and for their remaining lifetimes.

The payments have been assessed on an accruals basis, reflecting the timing of when each person's payment entitlements accrue rather than when the payment is actually made.

1.4 Terminology

The terminology and definition used for the key result of the actuarial valuation is critical to its communication. Reflecting the person-centred nature of the model, the agreed terminology has been built from the central concept of a lifetime cost and maintained from the baseline valuation. The key definition is:

Lifetime cost: *the net present value of future in-scope payments made to a person over the remainder of their natural lifetime at the valuation date.*

This concept includes all **future** payments after the valuation date, noting that current and previous welfare recipients will also have a history of past payments which is not included, given the future focus of the model.

Total Lifetime Cost

The total lifetime cost can be assessed for any group of people within the model population. In the discussion on the results we examine the total lifetime cost for the whole model population and for four groups of people in the population at the valuation date:

- Current income support welfare recipients - this includes any person who received an income support payment at any point in the 2015/16 year.
- Current non-income support welfare recipients - this includes any person who received a payment but did not receive any income support payments in the 2015/16 year.
- Previous welfare recipients. This includes any person who did not receive any payments in the 2015/16 year but who is known to have previously received one of the in-scope payments. Within this group we distinguish between:
 - Recent exits – people who exited in the last three years. This is people who received a payment in 2012/13, 2013/14 or 2014/15 but no payment in the current year.
 - Older exits – other people who are known to have previously received a payment.
- Rest of the Australian population – the remainder of the model population.

Future migrants and unborn children are not included in the estimate of total lifetime cost, but will appear in future valuations once they migrate or are born, and at that time will contribute to an increase in the total lifetime cost.

Average Lifetime Cost

For any group of people the lifetime cost can be considered in terms of the number of people in the group and the lifetime cost per person. Through this report we use the term **average lifetime cost** to refer to the per person lifetime cost for a group of people.

As discussed elsewhere, while the model does simulate the lifetime trajectory of each individual, it is only intended that results ever be considered for a similar group of individuals – either in total or on average for that group. Over time, as the model is developed further, the size of the group for which results are meaningful and statistically robust may reduce, enabling increasingly granular outputs.

In considering total and average lifetime cost results, the following points should therefore be noted:

- The actuarial valuation model is designed as a whole of population model with the purpose being to produce population and population group information rather than information for defined individuals. As such it captures the different risk characteristics that are important at a population level, but does not reflect all the factors that may result in different outcomes or different levels of payment for individual people.
- The total lifetime costs and averages can be assessed across the whole population or groups of people, within the following guidelines.
 - Such groups should include at least 1000 people.
 - Group level results will be more reliable when the groups are homogeneous. For example, results could be calculated for all the following groups:
 - Female age pensioners
 - Female age pensioners who are 70-75
 - Female age pensioners who are 70-75 and are partnered
 - Etc.
 - As groups are more highly specified, the more similar the people are within them. This means there is less variability in expected average lifetime cost within these more highly specified groups.
- The ability of the model to differentiate average lifetime costs between different people is limited by the extent of the factors included in the model.
 - For the baseline valuation model the factors used to differentiate outcomes included the person's starting class, their age and gender, their partner status, family composition and welfare history. Further differences arose as a result of the differential mortality assumptions used for Indigenous people and disability support pensioners.
 - For this 2016 valuation we have introduced a number of further factors into the model for some groups within the population. These factors focus on the income support recipients and include, for instance, information on the payment types received and whether income support recipients have any earnings from employment. The factors are discussed in detail in section 4.3.
 - Even where characteristics are not explicitly analysed within the assumption setting process we may be able to see some differences in average lifetime cost if other factors operate as proxies. For instance, the average lifetime cost for 30 year old people in the Working Age class currently living in one part of the country may differ to an equivalent group living somewhere else, although we have not explicitly included geographic location as a predictor in the model. The difference could arise if these groups have different demographic profiles or if features of their welfare history such as the average past duration in the payment system were different.
- Even for the most homogenous possible group, the average lifetime cost is the average of a range of costs each arising from a different possible future life trajectory. Many important determinants of costs such as future family composition and the length of a person's remaining life cannot be known with certainty, and can only be represented by probability distributions.

1.5 Reliances

This report has been prepared at the request of the Department to document the Actuarial Valuation of Australia's social security and income support system as at 30 June 2016. It is not intended, or necessarily suitable, for any other purpose.

The report relies on the completeness and accuracy of information compiled and provided by the Department. We have not verified that data is accurate or complete, but we have checked it for internal consistency and for consistency with other information summaries produced by the Department. We note that the Department also does not give any warranty as to the reliability or accuracy of the data provided to PwC for the valuation.

There is a limitation to the accuracy of the results contained in this report because of the inherent uncertainty of any estimation of such long term costs. The issue of uncertainty is expanded upon in section 7.5 of this report.

We accept no liability for loss or damage howsoever arising in the use of this report by the Department for other than the purpose stated above, nor for any use of this report, without full understanding of the reliances and limitations noted above, or for errors or omissions arising from the provision of inaccurate or incomplete information to us. We accept no liability for loss or damages howsoever arising in the use of this report by third parties.

The report has been prepared by the PwC Actuarial team led by Christa Marjoribanks, Michael Playford and Rosi Winn. The PwC team has been provided with statistical modelling assistance by a team of statisticians from Data Analysis Australia, led by Dr John Henstridge.

1.6 Professional standards

The advice in this report is Prescribed Actuarial Advice as defined in the Code of Professional Conduct issued by the Actuaries Institute. The advice is intended to satisfy that Code.

The International Actuarial Association has published an International Standard of Actuarial Practice 2 (ISAP 2) "Financial Analysis of Social Security Programs". It is our view that the standard is not intended to cover the type of social benefit system in Australia; it focuses on schemes with narrower scopes and elements of funding. As such, we do not consider it relevant to this valuation.



2 Method

2.1 Overview of valuation method

The overarching methodology for the valuation of the Australian social security and income support system has been retained from the baseline valuation. This approach reflects the Department’s objectives which include:

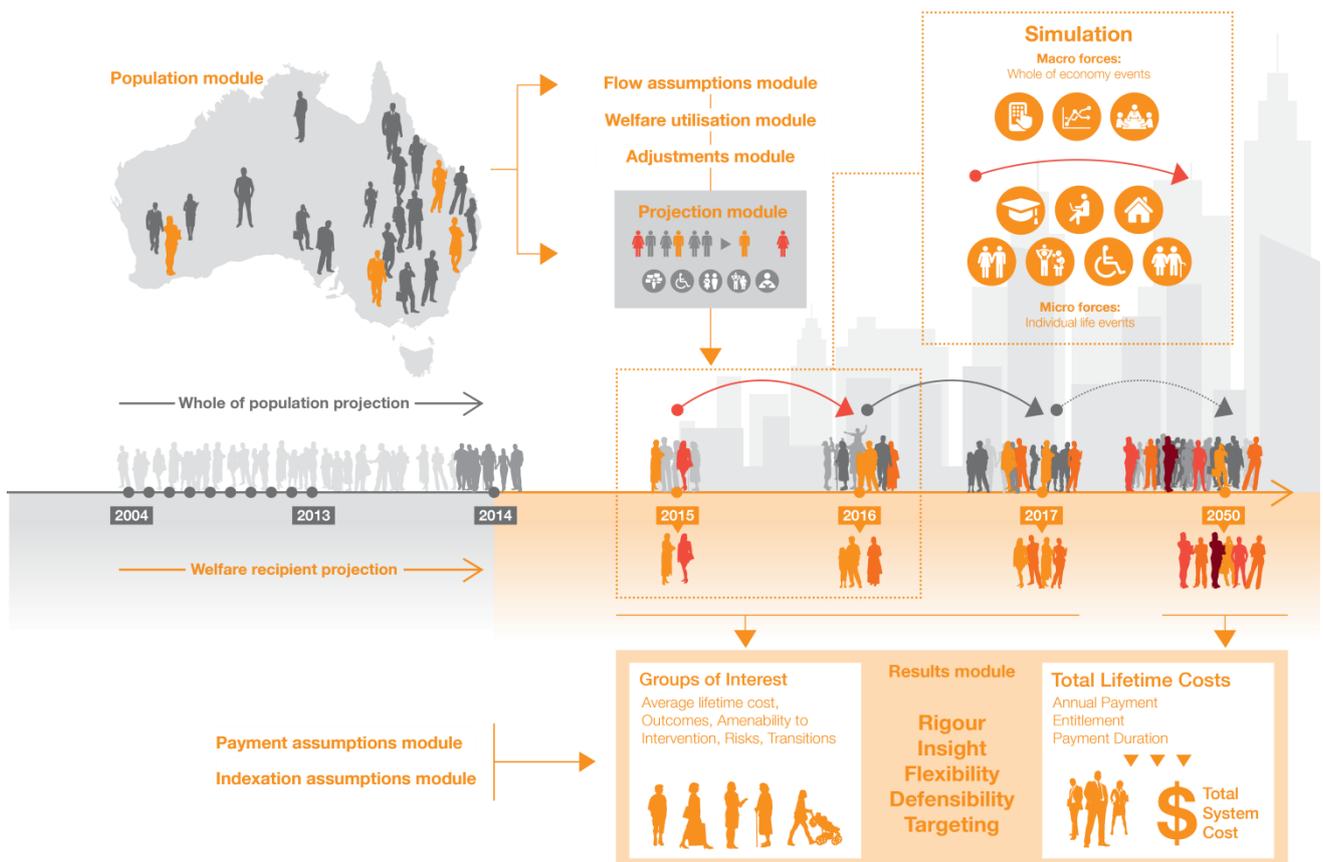
- Provide estimates of the future costs of the social security system (lifetime cost)
- Provide average lifetime cost estimates for groups of people
- Provide insights into the behaviour of groups of welfare recipients
- Provide insight into key drivers of lifetime cost and their respective influence, and
- Flexibility for the model to develop over time

These requirements suggest an individual person approach is needed rather than an aggregate approach and we have used a full population model and a simulation modelling approach as we consider that this provides maximum flexibility and will be able to provide information on all possible groups.

The model uses annual data and projects annual payments.

The graphic below represents the components of the valuation model and how the component modules that comprise the model interact with each other.

Figure 6: Overview of Method



A description of each of the modules follows.

Population module

The population module is used to generate an individual welfare recipient dataset for use in the simulation model. It represents the population at the valuation date and contains person records for all current and previous welfare recipients as well as all potential future welfare recipients i.e. it is representative of the full resident population of Australia.

It includes actual and imputed data for current and recent welfare recipients and representative data for the rest of the population.

For the 2016 valuation model we included people solely as individuals: we identified existing partners and children and modelled these going forward to allow us to examine how changes in these may influence people's interactions with the welfare system. However we have not modelled people in households, nor have we taken into account specific information on the use of welfare by related people whether partners, parents or children.

Assumptions modules

There are a number of modules which are used to develop the key assumptions for projecting individuals' trajectories through life and their interactions with the welfare system.

These assumptions include:

- Flow assumptions – reflecting peoples changing demographic characteristics
- Welfare utilisation – class movement assumptions and payment category utilisation assumptions
- Payment assumptions
- Adjustments – both economic and other adjustments
- Indexation and discounting assumptions

They are discussed in turn in section 5.

Projection module

The projection module is at the heart of the modelling and is used to project the path of each individual through their lifetime. The projections simulate people's future trajectories through life and the resultant interactions with the payment system. They include projecting individual characteristics such as basic demographics, partnering and children and the person's interactions with the welfare system and the types and amounts of payments received.

The module operates by applying assumptions to simulate the future trajectory of each person in the population, their welfare utilisation and payments in each future year. It operates iteratively with the experience in one year providing the starting point for the next year's iteration.

The model population and all of the model assumptions feed into this central module. Figure 8, section 4.4 represents a single iteration of the annual modelling cycle.

Results module

The projection module produces highly detailed outputs which include information on each person's welfare utilisation for each future year. The results module is the tool used to summarise these detailed outputs and develop information for use by the Department, and produce the total lifetime costs and class level results presented in this report.

This results module provides some standard information ('results') and the detailed projection module output can also be used to investigate the expected future experience of specific groups.

The results include the following categories of information:

- Lifetime cost results – e.g. overall lifetime cost results; lifetime cost results for different payment categories.

- Major group information and results – e.g. average lifetime cost information; demographic information; information on expected future trajectories.
- Lifetime cost forecasts, which will be used to understand the drivers of changes in the lifetime cost in future years.
- Projections of future welfare recipient numbers and expenditures (both limited to the current in-scope population).

2.2 Model uses

The valuation model design provides a flexible framework for exploring welfare system dynamics and the related lifetime cost outcomes.

The main results provide information on the current Australian population, which people are utilising welfare now and how the types and amounts of welfare payments vary across different groups of the population. They also provide information on the lifetime cost for different groups and the expected future pathways through the welfare system.

This information can be examined further for groups of people defined by age, gender, current payment or a range of other characteristics.

The model can be used at a “system level” to consider the likely future welfare utilisation of the Australian population as it grows and the demographic profile shifts over the coming years. We know that the population is expected to both grow and age; by considering which people within the population are more likely to draw on supports from the welfare system we can see how the numbers of people seeking to access different payments may vary in future.

The valuation also provides the ability to explore the sensitivity of the model results to changes in the model assumptions, and the model has the facility to quantify the impact of other assumption changes reasonably readily. This provides a platform through which different scenarios can be explored and their potential impact assessed over both the short and longer term. For example, the model could be used to explore the impact of different economic scenarios, changes in payment design (payment eligibility, amounts or indexation) or changes in fertility rates or the retirement age.

2.3 Limitations of the actuarial model

As well as understanding what the model can do, it is important to bear in mind what the model is not intended to do.

Essentially, it is a tool for understanding the long term impact of decisions made today and in the future, at a fairly high “system” level, and for groups of interest. It is a dynamic model that projects a limited number of factors over a long time period, taking into account how the population will change over that time and considering uncertainty. This contrasts with static models that quantify, at a much more detailed or precise level, the “overnight” impact of decisions or changes on today’s population. The models can and should work in tandem.

The actuarial model, particularly at this stage of its development, is quite financially-focussed. An important aim of the investment approach, supporting the mission of the Department, is to positively impact the lifetime wellbeing of people and families in Australia, as well as reduce welfare costs. It will therefore be important, in using the actuarial model to develop interventions, to adopt a framework that considers not just “savings” generated by the model, but also costs and benefits that are beyond the scope of the model.

In identifying groups of interest and developing potential policy interventions, it will be important to consider the actuarial model results together with other sources of information, such as:

- Short term impacts over the budget forecast period, as determined by detailed “overnight” costing models.
- Broader costs and benefits to other parts of the system, using more traditional economic approaches such as cost:benefit analysis.
- Qualitative expertise and research, such as evidence of impacts of different policy options on people’s lives and their lifetime wellbeing.

3 Data and definitions

3.1 Data

Data provided by the Department

The Investment Approach Taskforce has developed a longitudinal data suite to support its work. This has been developed from administrative data extracted by the Taskforce from the Department of Human Services. It consists of a large series of datasets which contain the information required for the analysis.

The data extracted includes entitlements data for regular payments, one-time payments and family tax benefit and characteristics data for a large number of different person characteristics. It covers the 15 financial years from 2001/02 to 2015/16. We have not used earlier time periods as we have been advised by the Department that the information that is currently included in the longitudinal data suite for earlier time periods is of limited completeness and quality.

The extracted data represents a selection of the data available in the Department of Human Services' Enterprise Data Warehouse. The selected data includes detailed historic entitlement information as well as higher priority historic demographic information. Moving forward, the Department and PwC are identifying areas to enhance the modelling dataset. As more questions are asked of the model, and as the sophistication of the questions asked also increases, the analysis of more detailed historic data is likely to be required. The data extraction and inclusion process will be one of continuous improvement.

Further information on the source data and its preparation for use in the valuation is provided in Appendix B.

Maturity of data

The data was extracted with an 'as at' date (the date at which data is cut-off) of 30 June 2016 (aligning to the valuation date) and an 'as known as' date (the date to which information known is recorded) of 30 June 2016.

The 'as known as' date of 30 June 2016 was selected after consideration of the Department's requirements for timely results and consideration of the patterns of future changes to the data beyond the date chosen which indicate that a three month lag would be needed to resolve the most major impacts. The selection of 30 June 2016 as the 'as known as' date gives rise to the possibility of new information being received after this point in time which changes the data and, in particular, that for the most recent financial year.

During the course of the baseline valuation and in considering previous studies on data maturity undertaken by the Department, we noted significant maturity issues for Family Tax benefits, child care benefit and child care rebate as people's entitlements for all these payment types are updated as new claims are made and information for existing claimants updated as people submit their tax returns. It would be necessary to wait until the end of September or later to obtain materially more complete data for these payment categories.

There is also the potential for more minor immaturity issues in other payment types as a result of a number of factors, including: people making applications for payments which then take time to be approved and the payments subsequently being backdated; time taken to adjust partial payments as people provide information on their income; changes as people have payments suspended or reinstated; and late reporting of deaths. The Departmental analyses suggest these factors result in the numbers of people receiving each income support payment to vary by 1-2% between those immediately being observed as receiving payments for any fortnight and a retrospective view of this. These data changes occur gradually over a number of months. When considered over a full financial year rather than for a single fortnightly payment period, we observed a net change in the numbers of people receiving income support payment types (in the 2014/15 year) to be between 0.4% and 1.8%. The most significant contributors to this difference was new entries to the system and people re-entering. Income support payments were only slightly affected by maturity, with reductions in payment amounts of 0.1% to 1.1%.

At the current and previous valuation, the maturity issues have been managed through development of modelling classes which recognise the delay in receipt of information for Family Tax benefits and child care benefits (see section 3.4) and through the careful selection of the time periods over which the experience has been analysed in developing assumptions. In the baseline valuation, some adjustments were made to the population data to reflect the undercount of FTB and child care in the 2014/15 records. At the current valuation, we have improved on this approach by undertaking a detailed data maturity analysis to identify areas of the valuation data requiring a maturity adjustment. The analysis involved a comparison of the valuation data used

for the 30 June 2015 valuation (which had an as known as date of 30 June 2015) to data with the same 30 June 2015 cut-off but with an as known as date of 31 March 2016.

We note that some degree of data development is expected as the data matures and that any adjustments will only be an approximation of the actual development and will themselves need to be based on assumptions drawn from past development patterns. We note also that making data adjustments adds to the complexity of the overall model and modelling process. For these reasons, adjustments were only made where they were expected to have a material impact on the valuation results (at an overall or class level) or to improve the robustness of the overall modelling process.

At this valuation, adjustments were made to the valuation data to allow for additional utilisation of payment categories H, I and J and to allow for the undercount of children. Adjustments were also made to the number of entrants and re-entrants projected in the first projection year to allow for movements from classes 10 and 12 into active welfare classes.

Other data sources

ABS Data

We have used data from the 1% Confidentialised Unit Record File (CURF) from the 2011 Census¹ in developing the population dataset. The CURF contains information about individuals, dwellings and families and these can be linked. We have used all these information sources.

We have drawn on a number of other Census summaries extracted using TableBuilder², a tool developed by the ABS for providing Census information. We also made use of information published by the ABS on the estimated resident population for Australia.

HILDA Survey Data

The Household, Income and Labour Dynamics in Australia (HILDA) Survey is a household-based panel study which began in 2001 and is managed by the University of Melbourne. It collects information about economic and subjective well-being, labour market dynamics and family dynamics. Information is collected annually through interviews with all adult members of each household. The survey covered around 7,500 households and 14,000 individuals in wave 1 with around 5,000 additional people being included in wave 11.

We have used the HILDA survey in developing the demographic assumptions described later in the report.

Life tables

We have referenced the Australian Life Tables 2010-12³ in developing the mortality assumptions used in the valuation model. These life tables are based on the mortality of male and female Australians over the three calendar years centred on the 2011 Census of Population and Housing (the Census). These life tables are developed by the Australian Government Actuary.

Other information sources

We have also used a number of other sources of information in developing our model and the assumptions. These are discussed in the relevant sections of this report and include economic data and forecasts, population projections and details of the welfare system and payment design, the eligibility criteria and indexation rates applying.

¹ ABS 2011 Census of Population and Housing, undertaken 9 August 2011.

² <http://www.abs.gov.au/websitedbs/censushome.nsf/home/tablebuilder?opendocument&navpos=240>

³ http://www.aga.gov.au/publications/life_table_2010-12/

Summary of the data used for assumption development

The main data sources used to develop the model assumptions are shown in Table 4 below.

Table 4: Social security data used for assumption development

Assumption Set	Specific individual assumptions	Information sources
Policy settings	Eligibility criteria for each payment type Payment structures for each payment type Policy change impacts	DSS summary information Centrelink payment guides Legislation and supporting explanatory memoranda DSS internal analysis of selected policy changes
Demographic assumptions (whole population)	Mortality Partner status Having children (fertility, taking on care of children) Education status	DSS data Population statistics Life tables Research on population experience HILDA Survey
Demographic assumptions (selected classes)	Employment earnings indicator Payment type Care recipient information for Carer payment recipients (age, relationship to carer, primary medical condition) Primary medical condition for DSP recipients	DSS data
Welfare class movement assumptions	New entrants to the payment system Movements between welfare classes Exits from the payment system	DSS data Supplemented by information on benefit design Modelled mortality
Payment utilisation assumptions	For each payment category and people in each class	DSS data Supplemented by information on benefit design
Payment assumptions	For people receiving payments in each payment category	DSS data Supplemented by information on benefit design
Economic adjustment assumptions	Unemployment rate Relationships between welfare class movements and unemployment rate	Economic forecasts Past economic data DSS data Supplemented by input from economic experts
Economic assumptions	Indexation Discounting	External economic data Referencing information on benefit design

3.2 Scope of payments

During the 2015/16 year the Department was responsible for \$111.5 billion of payment entitlements.

PwC have worked together with the Department's staff to define which payments should be in scope. There are around 100 payment types in the data of which around 85 were determined to be in-scope. The excluded payments total approximately \$30 million with the main payment type excluded being the flexible support payment which is outside of the policy responsibility of the Department. Payment types were excluded if they were for payments that have been discontinued or replaced, for example the Back to School bonus was excluded as were some supplements that have been out of use for many years.

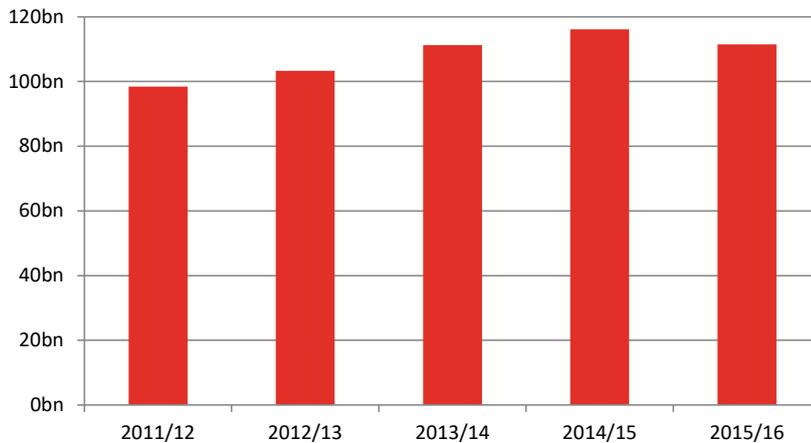
Some slight refinements have been made to the scope of payments for the 2016 valuation.

The list of in-scope payments being valued is provided in Table 5 and Table 6 below and generally includes payments for which the Department has policy responsibility as at 30 June 2016, together with child care payments which were included in the scope of the baseline valuation and have continued to be included for consistency although the portfolio responsibilities for child care transitioned to the Department of Education and Training on 21 September 2015. This list of in-scope payments includes income support payments to both working age people and age pensioners, family payments, and various supplementary payments and allowances.

The scope does not include veterans' payments, concession card benefits, aged care payments or payments under the National Disability Insurance Scheme (NDIS) (note this list is not exhaustive).

The total amount of in-scope payments paid in each of the last five financial years is shown below.

Figure 7: In-scope payments by financial year 2011/12 – 2015/16



Note: the payments are slightly understated for the most recent year as some of the family tax benefit payments and much of the child care benefit payments are made after the end of the financial year and are therefore not captured under the 30 June 'as known as' date. As was expected, the payments in the 2014/15 year have retrospectively increased since the baseline valuation.

3.3 Payment type categorisation

The payment types have been grouped into 17 broader payment categories for modelling in the valuation. The amounts of payments received by each person within each category are considered in building the valuation models and setting the assumptions. This categorisation is intended to achieve a balance between the benefit of the valuation model capturing the different features of each payment and the costs of having the additional complexity of more payment categories in the model. We considered the following criteria for grouping payment types into categories:

- The purpose of the payment
- The eligibility criteria and target group
- The indexation regime applying
- The importance of the payment within the whole system: its relative size in terms of expenditure and the number of people receiving payments

In general we have separated supplements from the main pension payments as these are often subject to different indexation and, as not all pension recipients will receive all the supplements, it allows for cleaner modelling (especially of the main payment). The resultant payment categories are described below.

Note that people may receive payments from a number of different payment categories during each year.



Income support payment categories

There are seven income support payment categories which capture the main financial supports provided when people are of pension age or of working age and either not able to work or not able to find work. People can only access one of these payment types during each fortnightly assessment period.

These categories have been retained from the baseline valuation with no changes in their definitions.

Table 5: Income support payment categories and components

Income support (IS) payment category	Components
A - IS Studying	Abstudy - studying Austudy YA (Student)
B - IS Working Age	Abstudy - working Austudy - working Newstart Sickness Allowance Special Benefit YA (other)
C - IS Parents	Parenting Payment - Partnered Parenting Payment - Single
D - IS Carer	Carer Payment
E - IS Disability	Disability Support Pension
F - IS Age	Age Pension Widow B Pension Wife Pension
G - IS Dependent	Partner Allowance Widow Allowance

Notes:

Abstudy - working and Austudy - working include apprenticeships

YA (other) includes both job seekers and apprenticeships.

These payment categories align closely with the income support class definitions (discussed in section 3.4):

- For the Working Age class people receive some payments in either category B or G.
- For the other five income support classes everyone in the class receives some payments in the related payment category. For example everyone in class '3 Parents' receives some payments in category C.

Non income support payment categories

There are ten non income support payment categories which capture the other supplements, allowances and payments provided. These include pension supplements, major payments such as Energy Supplement, Family Tax Benefit, child care payments and a large number of smaller payments.

Some of these payments are paid regularly throughout the year and may be received alongside an income support payment; others are one off payments or link to the tax system.

Following a full review by the Department, there have been a small number of changes made to these payment category definitions since the baseline valuation (as marked in the table below). Some component payments have been reassigned to different classes for improved modelling, others for better consistency with the treatment of similar or related payments.

The details of each payment category, the component payment types and changes are set out in the table below.

Table 6: Non-Income support payment categories and components

Non income support (Non-IS) payment categories	Components	Changes since baseline valuation
H - Other FTB	Family Tax Benefit A Family Tax Benefit A Supplement Family Tax Benefit B Family Tax Benefit B Supplement Family Tax Benefit – old Multiple Birth Allowance Large Family Supplement	Multiple birth allowance has been reassigned into Category H from Category I
I - Other Family	Child Care Benefit Child Care Rebate Child Care Payments Double Orphan Pension Schoolkids Bonus Single Income Family Supplement	Multiple birth allowance has been reassigned into Category H from Category I
J - Other New Parent	Dad and Partner Pay Maternity Payments Newborn Payment Parental Leave Pay Stillborn Baby Payment Baby bonus	Baby bonus has been included in the scope and assigned into Category J
K - Other Living	<i>(None - this category has not been used for the 2016 valuation)</i>	Rent Assistance has been reassigned to new category R. Other payments have been reassigned to category P for improved consistency.
L - Other Health & Disability	Mobility Allowance Essential Medical Equipment Payment Incentive Allowance Youth Disability Supplement	<i>No changes</i>
M - Other Carer	Carer Allowance Carer Supplement Child Disability Assistance Payment Carer Supplement - old	<i>No changes</i>
N - Other Study & Skills	CDEP Supplement Education Supplements Fares Allowance Relocation Allowances Training supplements Education Entry Payment Language Literacy & Numeracy Supplement Pensioner Education Supplement Relocation Scholarship School Fees Allowance School Term Allowance Student Start-up Scholarship Student Start-up Loan Work for the dole Work program supplement	The new Student Loan payment has been assigned to Category N
O - Other Remote & Regional	Assistance for Isolated Children Remote Area Allowance	<i>No changes</i>

Non income support (Non-IS) payment categories	Components	Changes since baseline valuation
P - Other General Allowances (for general pension supplements)	General Supplement Income Support Bonus Low Income Supplement Income Management Pension Supplement Pension Bonus Scheme Payment Pension Bonus Top-Up Payment Pensioner Loan Energy Supplement Living Allowances Pharmaceutical Allowance Residential Costs Telephone Allowance Utilities Allowance Incidentals Allowances	Payment types that are now included within pension supplements have been reassigned from old category K. This is for greater consistency in category definitions over time. Assistance for Older Australians has been split out of the primary payment category and assigned to Category P. Seniors supplements and concessions has been included in the scope and assigned into Category P
Q - All Other	Bereavement Allowance Bereavement Lump Sum Crisis Payment	<i>No changes</i>
R – Rent Assistance	Rent Assistance	New payment category created for improved modelling.

People can access many of these payment types (and hence categories) during a year and some payment categories such as P – other general allowances are utilised by a high proportion of the people in receipt of Commonwealth welfare payments.

3.4 Welfare class definitions

From our previous experience and research we know that past and current receipt of welfare is a very strong predictor of future receipt of welfare. For example, some groups of payment recipients have few exits and it is highly likely a current payment recipient would also receive the payment next year.

Therefore, we have created broad welfare class groupings which reflect each person's life situation and use of welfare for consideration in the modelling. There are twelve **welfare classes** to which a person can belong and these are summarised in Table 7 below.

These classes have been defined by reference to the payment types currently being received; however the types have been grouped so that the classes are more a reflection of an individual's life situation than that of the detailed payment type structure per se. Most of the welfare classes contain people who receive one or more of a number of payment types. For example the Studying class contains people who received student income support payments being Austudy, Abstudy or Youth allowance (students).

People are assigned to a single unique class each year.

The classes are defined in a hierarchical way so that any person in receipt of any income support payment during the financial year will be assigned to one of the active income support classes. People receiving more than one type of income support payment during a year will be assigned to a class based on the most recent payment. For example, a 65 year old person who received the Disability Support Pension for the first 7 months of the year and the Age Pension for the last 5 months will be assigned to class '6 Pension Age'.

People not receiving income support payments will be assigned to non-income support classes '7 Non IS Family', '8 Non IS Carer' and '9 Non IS Other'. These are also defined hierarchically in the following order of precedence: carer, family, other. The remainder of the population will be assigned to one of the inactive classes. This hierarchy will ensure that each person is assigned to a unique class for each year.

Table 7: Welfare classes and mapping of payment types to them

Active – income support (IS)	Active – non income support (Non IS)	Inactive classes
1 Studying People receiving any Studying income support payments (payment category A) as their most recent income support payment.	7 Non IS Family People not receiving any carer payments but receiving one or more of the following payment categories in the previous year: <ul style="list-style-type: none"> • Other FTB • Other Family • Other New Parent 	10 Previous welfare recipient People who were previously in one of classes 1 to 9 but are not for the latest year.
2 Working Age People receiving any Working Age income support payment or Dependant income support payment (payment category B or G).	8 Non IS Carer People receiving any Other Carers payments	11 Dead People who have died during the previous year or in prior years.
3 Parenting People receiving Parenting Payment (Partnered or Single) as their most recent income support payment (payment category C).	9 Non IS Other People receiving payments but not in any other welfare recipient class.	12 Rest of Aust. population Rest of modelled population.
4 Carers People receiving Carer Payment (payment category D) as their most recent income support payment.		
5 Disability support People receiving Disability Support Pension (payment category E) as their most recent income support payment.		
6 Pension Age People receiving any Age income support payments (payment category F) as their most recent income support payment.		

Note there is an important distinction between the class and payment category definitions:

- **Individuals are assigned to a single unique class for each year. This class information is a way of assigning the population into unique segments, however**
- **Individuals can receive payments from multiple payment categories in any year.**

By way of example a person who enters class '4 Carers' during the year might receive Carer IS payments together with FTB and Other Family payments, Other General Allowances (pension supplements) and Other Carer payments (carers supplement and/or allowance). They are in a single class for the year but receive payments from multiple payment categories.

Lagged definition for class 7

As FTB and family payments can be received as part of an income tax assessment post 30 June relating to a previous year, some people who are eligible for 2015-16 payments would not yet have relevant data recorded as at 30 June 2016. For modelling purposes, it is important that classes for a given year are not expected to change significantly as future data becomes available. In order to provide this stability, people are assigned to class '7 Non IS Family' based on whether they are eligible for family payments in the previous year instead of the current year.

Consequently, new welfare entrants eligible for family payments for the first year will be assigned to class '9 Non IS Other', moving to class '7 Non IS Family' in the second year. People who are no longer eligible for family payments will remain in class '7 Non IS Family' for a year before they move to class '10 Previous Welfare Recipient'.

Welfare class examples and considerations

The steps in assigning each person to a class are as follows:

- If an individual received an income support payment at any point during the year, then their class at the end of the year is determined by their most recent income support payment, with reference to the payment mapping in Table 7.
- If an individual did not receive an income support payment but received a non-income support payment, their class is as follows (again with reference to be payment mapping in Table 7)
 - 08 Non-IS Carer if any carer payment was received during the year; if not then
 - 07 Non-IS Family if any family payment was received during the previous* year; if not then
 - 09 Non-IS Other
- If an individual did not receive any payment at all during the year but has received an in-scope payment over the last 15 years, then their class is 10 Previous Welfare Recipient
- If an individual did not receive any payment at all during the year and has not received an in-scope payment over the last 15 years, then their class is 12 Rest of Aust. Population
- An individual is only in 11 Dead if he or she was not alive at any point during the year. If an individual dies in a year, their class is not affected in that year.

The following examples illustrate the treatment of individuals in the class structure under hypothetical scenarios.

Example 1: No payments received for 2014/15, Newstart Allowance received for 2015/16 – Individual entered the system during the year as no payments were made in 2014/15 but a payment was made in 2015/16. Individual enters into class '2 Working Age' at June 2016 as Newstart Allowance is in this class.

Example 2: Carer Allowance received for 2014/15, no payment received for 2015/16 – Individual was in class 08 Non-IS Carer at June 2015 and exits the system, moving to Class 10 Previous Welfare Recipient at June 2016.

Example 3: FTB amount received for 2015/16, no payments received for 2014/15 – Individual allocated to class 09 Non-IS Other at June 2016 as no family payment was made in the previous year. Individual was inactive in 2014/15 so this is an entry into the system.

As can be seen the class of an individual depends on the payments over a full year. We have discussed below how changes in different circumstances will be reflected in the class of an individual, and the timing of this:

- A move from one income support class to another income support class during the year will be immediately reflected in an individual's class status at the current year end. A move from a non-income support class to an income support class during the year will also be immediately reflected in an individual's class status at the current year end
- Exits from an income support class during the year to a non-income support class will not be reflected in an individual's class status until the following year end
- Exits from the welfare system, from either income or non-income support payments, during the year will not be reflected in an individual's class status until the following year end

There is a practical consideration that these features should be considered when conducting any programme evaluation, and in particular how quickly changes in payments will be reflected by class movements. In these circumstances, supplementary analysis or consideration of other model outputs may be of use.



4 Refinements for 2016 valuation

4.1 Staged development of model

The actuarial valuation model has been designed to provide the Department with a comprehensive and flexible platform that can be further developed over time.

Baseline valuation approach

During the baseline valuation the model was built in stages, adopting a “try, test, learn” philosophy from the start, in collaboration with the Department. In particular the valuation development approach used two key stages:

- First a simplified version of the model was developed which contains each of the main modules but calibrated with assumptions which only reflect each person’s age, gender and starting class. We refer to this as the foundation model and the assumptions used as foundation assumptions.
- Then the full model was developed by refining each module to include more detailed information on each person’s individual characteristics and welfare history. This included undertaking detailed analyses to refine key parts of each set of assumptions to consider a range of the individual person characteristics and the person’s welfare history in the model assumptions.

This approach was valuable as it allowed us to progress quickly to a view of the overall costs and understand the relative contribution of each population segment and payment category. With a limited window of time for model development this helped ensure that the complex modelling effort was focussed on the more important assumptions.

In preparing the final baseline model the time and complexity required to introduce each risk characteristic was balanced with the need for robust, timely results. As agreed with the Department, during this phase of work we applied the principle of “optimising” the utility of the model without compromising its quality or the timeliness of its delivery. This resulted in us continuing to adopt foundation assumptions in a number of areas where we considered the risk based models to be of less value, or where data was sparse.

The foundation model and assumptions provided additional benefit in that they assisted with the risk management and model validation by providing a model form that was easy to replicate and check and could then form a point of comparison for the final more complex risk based model. Further, the foundation assumptions are in a form that is practical to present and visualise, and this was useful in supporting the discussions we had with the Department on the past experience.

2016 valuation approach

For the 2016 valuation we have further developed the valuation model and its assumptions. Details of these developments are discussed through the remainder of this section.

Given the benefits identified during the baseline model development, we have retained the two-stage development approach that was used in developing the assumptions for the baseline valuation. Using this approach we first develop a relatively simple foundation set of assumptions (typically reflecting age, gender and starting class) before progressing to develop the full risk-based assumptions.

Subsequent valuations

The model will continue to be further developed in conjunction with the Department over the remaining years of PwC’s contract, refining the analysis and exploring the use of more data. The priorities for model improvement ahead of the next (30 June 2017) valuation will be discussed and agreed with the Department and IDC.

4.2 Overview of model developments for 2016 valuation

The model developments can be categorised as follows:

- **Model updates:** the updating of the model and assumptions to reflect new data. This update includes consideration of any changes in the welfare system itself; the welfare experience over the last year; changes to the population and the external environment.
- **Model refinements:** changes made to further develop the inner workings of the model based on the learnings gathered during the baseline valuation, feedback and through having a longer modelling timeframe available for model development.
- **Model extensions:** changes made to provide additional functionality or consider further information in the model.

The table below provides summary of these developments.

Table 8: Summary of model developments for 2016 valuation

Item	Details
Policy settings	<ul style="list-style-type: none"> • Updates: to reflect changes to the policy settings between 30 June 2015 and 30 June 2016 • Refinements: improved methodology for making adjustments to reflect the current policy settings.
Data	<ul style="list-style-type: none"> • Refinements: Further work has been undertaken to redefine the payment category definitions and mappings for supplements and allowances.
Population module (data maturity)	<ul style="list-style-type: none"> • Refinements: The 2016 valuation analysis has explored the extent of data maturity issues and developed explicit adjustments for the main areas where data is immature. • Refinements: The approach for developing the 2016 valuation population module now uses a more detailed algorithm for projecting the population demographic characteristics from the census date to the valuation date.
Demographic (flow) assumptions	<ul style="list-style-type: none"> • Refinements: Further work has been undertaken to refine the assumptions for partnering, children and educational attainment. • Refinements: we have reviewed and refined the mortality assumptions, most notably to reflect DSP medical condition information.
Data and Assumptions for new class specific data variables	<ul style="list-style-type: none"> • Extensions: The model has been extended significantly to include the data and forward modelling of five new class characteristic variable groups for relevant classes: <ul style="list-style-type: none"> – payment type (classes 1, 2, 3) – employment earnings indicator (classes 1-5) – primary care recipient age, relationship to carers and medical condition category (class 4) – number of adult care recipients and number of child care recipients (class 8) – DSP medical condition category (class 5)
Class movement assumptions	<ul style="list-style-type: none"> • Updates: the assumptions are updated to reflect recent experience and current policy settings • Refinements: the assumptions have been refined by including new risk based assumptions for classes 5 and 7 • Extensions: the assumptions are extended to consider the influence of the class characteristic variables on class movements
Payment utilisation and payment size assumptions	<ul style="list-style-type: none"> • Updates: the assumptions are updated to reflect recent experience and current policy settings • Refinements: the assumptions have been refined to: <ul style="list-style-type: none"> – reflect the revised payment categories – provide improved modelling of the interactions between utilisation of family payments, FTB and new parent payments. • Extensions: the assumptions are extended to consider the influence of the class characteristic variables on payment utilisation and size • Extensions: the number of utilisation and payment models which allow for risk characteristic variables was increased.
Adjustments module	<ul style="list-style-type: none"> • Extensions: an economic module has been developed and adopted into the 2016 valuation model • Refinements: the adjustments module has been refined to provide improved functionality and flexibility.
Projection and results modules	<ul style="list-style-type: none"> • Extensions: the module has been extended to provide the additional functionality needed to implement the class characteristic variable modelling and refinements to the payment models. • Refinements: the projection and results modules have been refined to incorporate improvements identified during the baseline valuation.

The most significant of these developments are the model extensions to add the class characteristic variables into the model and the development of the economic module, together with the updating of the population and assumptions to reflect the current policy settings and latest year of experience.

4.3 Addition of class characteristic variables

Several new class characteristic variables have been added to the valuation model for the 2016 valuation. These variables were selected by the Department.

These new variables have been included in this valuation to provide improved information on the risk characteristics which drive outcomes for different groups of welfare recipients. The new class characteristic variables that have been included are shown in the table below.

Table 9: New class characteristic variables

Variable	Description	Relevant Classes
Primary Care Recipient Age	Age of primary care recipient at 30th of June each year.	4
Primary Care Recipient Relationship	The relationship between the carer and primary care recipient. Relationship type grouped into Child, Parent, Partner, Other or Unknown.	4
Primary Care Recipient Medical Condition	The medical condition of the primary care recipient grouped into one of ten categories.	4
Number of Adult Care Recipients	The number of adult care recipients. Banded to 0, 1, or more than 1 adults	8
Number of Child Care Recipients	The number of children care recipients. Banded to 0, 1, or more than 1 child	8
DSP Primary Medical Condition	The primary medical condition of a disability support pension recipient grouped into one of ten categories.	5
Employment earnings indicator	Indicator showing whether the welfare recipient earned any income over the year from employment. Either yes or no.	1,2,3,4,5
Payment Type	The most recent income support payment type the welfare recipient received relating to that welfare recipients class for the year. (See Table 5 for a list of relevant payment types).	1,2,3

It is important to note that these variables capture information which is only available for subsets of the population. The subset is different for each of the variables, but is typically people within one or more classes.

All class characteristic variables added to the model are forecasted into the future for each individual in the population for the future years where they are forecasted to be in the relevant classes. An illustrative example is provided below:

Sarah is currently a 19 year old student receiving Youth Allowance supporting herself with some income earned through part time work. Being a student she is in class 1. While Sarah remains studying each year the payment type she receives and whether she has any employment earnings over the year are forecasted.

One possible pathway for Sarah is that she continues her part time work each year while she studies and remains on Youth Allowance until she graduates. Sarah, now aged 24, finds full-time work and exits the welfare system.

While Sarah studied and looked for work, relevant information such as payment type and income that may help understand Sarah's outcomes were forecasted. However, no information is forecasted for any medical condition and carer relationships which Sarah may have as she has remained outside the classes for whom these variables are developed.

If Sarah had a different life pathway which resulted in a future reliance on disability support pension then the model would allocate her a primary medical condition at the time at which she enters class 5 and this condition would influence Sarah's subsequent outcomes.

The approach for developing the class characteristic variable assumptions is discussed in section 5.

4.4 Modelling sequence

The modelling sequence is an important consideration in developing the valuation model and each of the assumption sets. This is because most of the variables being simulated are inter-related with each other. For instance, a persons' likelihood of having a child during the year will be different depending on whether they are partnered or not.

Thus we have established a modelling sequence which is used for each year of the forward projection. The assumptions are developed to reference the information which is available at the relevant point in the sequence.

The sequence has been updated at the 2016 valuation to include the class characteristic variables. All of these variables are simulated after class, as information for certain variables is only consistently collected and relevant for people in selected classes. The decision was made to simulate the class characteristic variables after class but before utilisation as the variables have the potential to influence the utilisation of various payment types and payment amounts.

The order in which the class characteristic variables themselves were simulated in the valuation was also considered carefully. For example, while an individual’s type of medical condition may affect their ability to earn income, whether or not an individual earned income should not affect an individual’s type of medical condition.

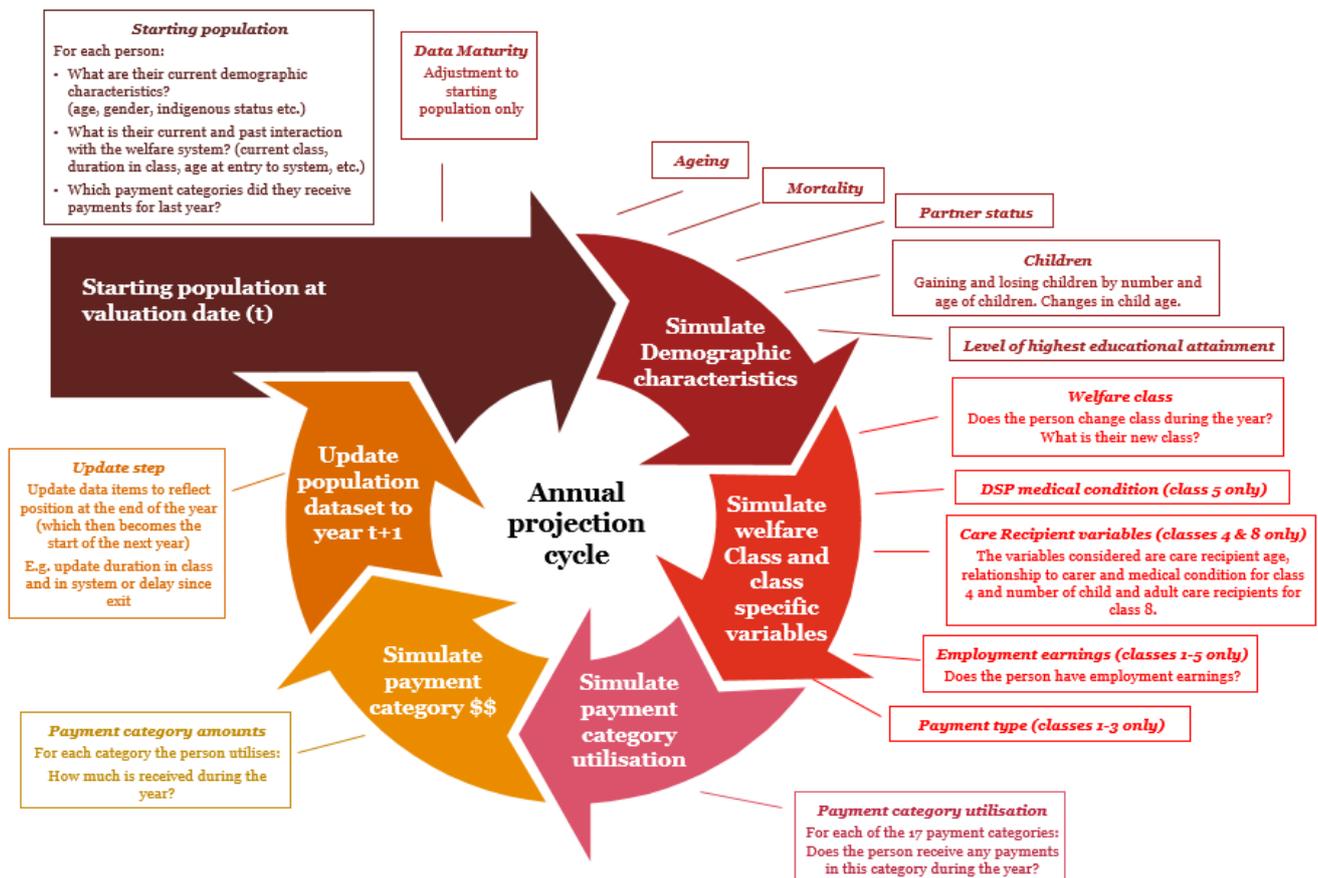
For each class the updated modelling sequence for the class characteristic variables is provided below.

Table 10: Modelling sequence for class characteristic variables

Class	Variable 1	Variable 2	Variable 3	Variable 4
1 - Studying	Earnings indicator	Payment type		
2 – Working Age	Earnings indicator	Payment type		
3 - Parenting	Earnings indicator	Payment type		
4 – Carer IS	Care recipient age	Care recipient's main medical condition	Relationship between carer and care recipient	Earnings indicator
5 – DSP	Primary medical condition	Earnings indicator		
6 – Age pension	n/a			
7 – Family non IS	n/a			
8 – Carer non IS	Number of child care recipients	Number of adult care recipients		
9 – Other non IS	n/a			

This leads to an overall modelling sequence as follows:

Figure 8: Variable modelling sequence for 2016 valuation



4.5 The economic adjustments module

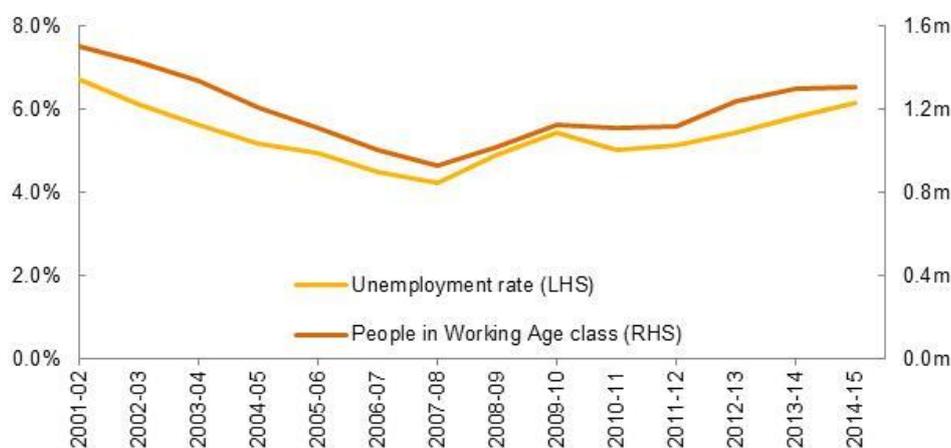
At this valuation, an economic adjustments module has been developed and included within the overall valuation model.

Rationale for the economic adjustments module

For any given policy settings, the utilisation of welfare is affected by a mix of demographic and economic factors. While demographic trends drive many aspects of welfare utilisation in the long run, cyclical fluctuations in the economy may cause it to increase or fall temporarily.

This is illustrated in the chart below which shows the relationship between the number of people in the working age payments class and the unemployment rate. The relationship between numbers of people in other classes and macro-economic factors is less apparent. As economic conditions worsen and unemployment, income and asset prices deteriorate, the number of individuals eligible to receive a working age payment rises.

Figure 9: Relationship between unemployment rate and the number of people in the working age payments class



Source: ABS 6202.0 and PwC analysis of Departmental data

Many of the existing model assumptions are established based on recent experience, in particular the class movement assumptions that reflect how people enter, exit and move through the welfare system. Together these assumptions drive the expectations of future welfare utilisation.

Without an economic module, increases or decreases in these movements that have arisen from the economic cycle could over or understate long run expected utilisation and make the model overly responsive to short term fluctuations.

The role of the economic adjustments module is to provide a means of distinguishing economic influences on past experience and explicitly adjusting for the prevailing economic conditions. It is intended to dampen the impact of these cyclical fluctuations on the valuation results so that they are more reflective of economic conditions expected over the long term timeframe covered by the model.

This module has been used to understand the extent to which the macro-economic environment influences welfare utilisation and the extent to which the size and mix of current welfare recipients has been influenced by the economic factors.

For the baseline valuation, no economic adjustments were made to the assumed rates of welfare utilisation, which were based on recent economic conditions. This reflected the limited timeframe available for the baseline valuation and the unemployment rate being close to the expected long run position.

At this valuation, the valuation results reflect the expected pathways, welfare utilisation and lifetime costs under an explicit economic scenario. This replaces the implicit scenario of a continuation of recent experience used for the baseline valuation.

Macro-economic indicators

A wide range of economic indicators were considered in the development of the economic adjustments module, including the unemployment rate, participation rates, Average Earnings (from) National Accounts (AENA) and household assets.

For each of these candidate indicators we explored the strength of the past relationships with the welfare utilisation experience and considered which of the indicators were best able to act as an indicator of the overall macro-economic environment. The criteria considered included:

- Relevance, considering research as to the linkage between the definition of the indicator and economic performance in the domestic economy;
- Availability of historical data, forecasts and projections; and
- The strength of the historical evidence of the relationship between the indicator and welfare utilisation.

Following this analysis and discussions with IDC members, the unemployment rate was selected as the best economic indicator to be used within the economic adjustments module.

Unemployment rate history and outlook

Historical information on the actual unemployment rate to 30 June 2016 has been developed based on ABS statistics. Information on the future outlook for the unemployment rate has been based on the most recent published Treasury outlook, as shown in the table below.

The approach for determining the unemployment rate outlook and long run unemployment assumption was considered by the IDC during the course of the 2016 valuation work. The selected assumptions were adopted after consultation with the Department and the IDC.

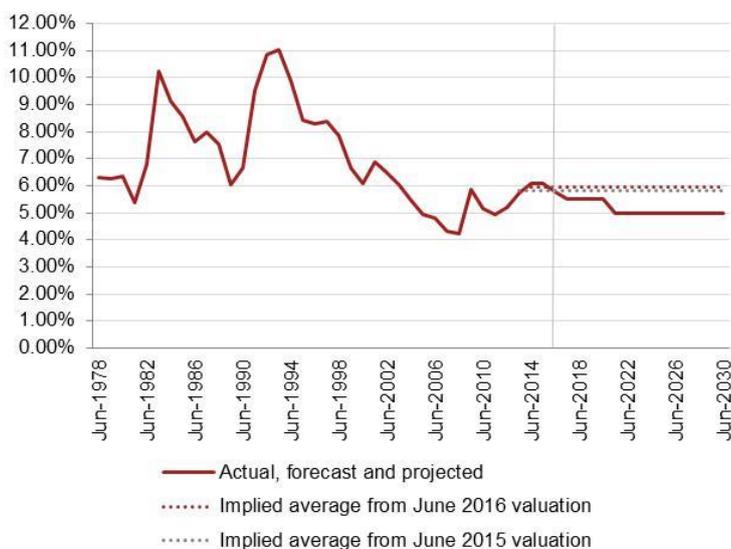
Table 11: Unemployment rate assumptions underpinning the economic adjustments module

	Outcomes		Forecasts		Projections		
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Long run
Unemployment rate	6.10%	5.75%	5.50%	5.50%	5.50%	5.50%	5.00%

Source: Treasury, as published in the 2016-17 Federal Budget, Budget Paper no.1 Table 2: Major economic parameters and Budget Statement 2, Economic Outlook Medium-term projections

These forecasts are somewhat lower than the recent history, as illustrated in the chart below.

Figure 10: Historical and projected unemployment rate



Source: 2016-17 Federal Budget, Budget Paper no.1 and PwC analysis

We have also shown information on the average unemployment rates over the three-year reference periods which are used as the experience base for the majority of the class movement assumptions.

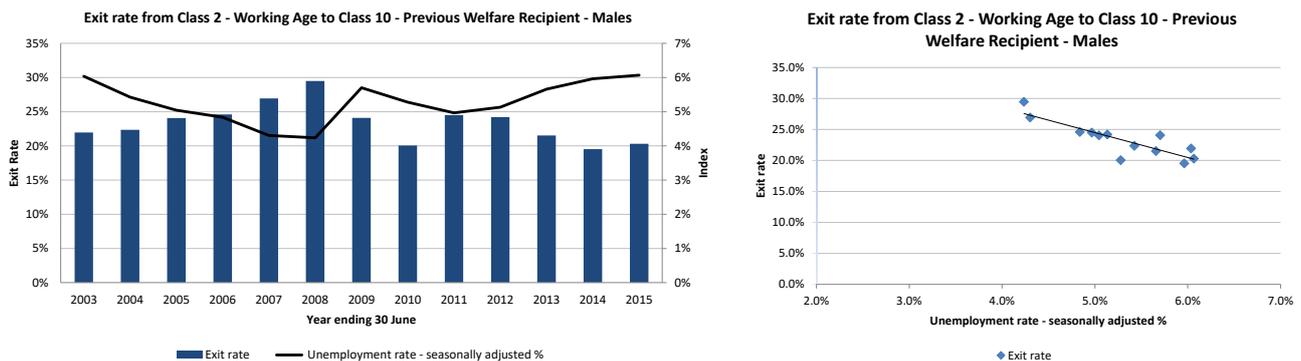
For both the valuations the average unemployment rate over the reference period was close to 6%, with it being slightly higher for the June 2016 valuation, reflecting the timing of the peak in the chart above.

Development of the economic adjustments

The economic adjustments were developed using a two stage approach.

Firstly, the nature and strength of the relationship between each class movement and the past unemployment rate was explored using statistical analysis. An example of this is provided in the chart below.

Figure 11: Relationship between the unemployment rate and exit rates from Working Age to Previous Welfare Recipients (Males)



This approach was used to identify which class movements were most impacted by changes in the unemployment rate and thus would require adjustment. The current version of the economic module focusses on the strongest relationships which have been identified, in particular those relating to utilisation of working age payments. Further development of the module may be considered in future, as a greater body of reference data becomes available for analysis.

The included adjustments cover:

- Entries to the Working Age class from classes 10 and 12
- Exits from the Working Age class to class 10, and
- Movements from the family non income support class (class 7) to the Working Age class (class 2)

The second stage was to develop the adjustments. This built on the initial analysis by using the parameters fitted in the correlation analysis above, which captures the change in transition rate for a 1% change in the unemployment rate, as a starting point for the adjustment factors.

The impact of the economic cycle on welfare utilisation is not constant by age. Thus the factors were refined by considering the extent to which changes in transition rates differ for people of different ages. In particular it was observed that the impact of changing economic conditions was greater for the youngest and oldest workers.

The factors developed were then tested for a range of different economic scenarios with the modelled impacts on the welfare population being validated against past experience.

Impact of the economic adjustments module

The economic module itself has minimal impact on the assessed lifetime cost as it simply provides a mechanism for considering different economic scenarios.

However, through the introduction of this module the valuation assumptions have been changed from an implicit assumption of the future economic conditions being similar to recent past experience to an explicit scenario which includes a long run unemployment rate of 5%. This rate is lower than the recent experience and has a material impact over the long future time period covered by the model.

More specifically, as the assumed unemployment rate falls from its current level over the medium to long term the economic module allows for reductions in the rates of entry into Working Age payments, increases in the rates of exit from Working Age payments and decreases in the rate of transition from Non IS Family payments to Working Age payments. These changes reduce the expected numbers of people receiving income support in future years and reduce the assessed lifetime cost.

The impact of this change is discussed in the results section and we also show the sensitivity of the results to the economic assumptions by providing results under alternate economic scenarios.

Limitations of the economic module

The economic module has been designed to provide a means of distinguishing the main economic influences on past experience and explicitly adjust for the prevailing and expected future economic conditions. It has been calibrated through consideration of the experience over the last fifteen years, being the period of time for which historic data was available for both welfare utilisation and the economic indicators.

Through using the module the valuation model results are expected to be less subject to short term fluctuations and more reflective of economic conditions expected over the long term timeframe covered by the model. Similarly the module's use will reduce the impact of economic fluctuations on the outcomes being assessed for the various groups of interest.

However, it is also important to note that the economic module has limitations. It does not capture every relationship between welfare utilisation and the economic environment. In particular, we have not allowed for the impacts of future fluctuations in asset values which are likely to have a particular impact on the proportion of the population who access the aged pension.

Further, as the assumptions have been calibrated based on a period of experience where the unemployment rate varied within the range 4% to 7% its ability to reflect more extreme scenarios such as the experience during periods of high unemployment will be limited and the results under such scenarios should be interpreted with caution.

5 Assumptions

5.1 Overview of assumptions

This section details the nature of the main assumption sets and explains how each is used in the model. These comprise: the policy basis, flow assumptions, welfare utilisation assumptions, payment assumptions and economic assumptions.

The purpose of each of these sets of assumptions is as follows:

- **Policy setting basis** is used to determine the payments included in the valuation and their related eligibility criteria and payment structures.
- **Flow assumptions** are used to ascertain how each person's individual demographic and risk characteristics change as time progresses.
 - For the 2016 valuation these flow assumptions include those for a number of **class characteristic variables**, which capture what each person's characteristics are when they enter one of the relevant classes and how these characteristics change for the period they remain in the relevant class.
- **Welfare utilisation assumptions** are used to develop the assumed probability of each individual in the population receiving each category of payment in each future year. They are developed by considering:
 - **welfare class movements** (how people move in, between and out of welfare classes).
 - **payment utilisation** of each payment category for people within each welfare class.
- **Payment assumptions** are used to assess the actual amount of payments made within each payment category once we have determined that an individual is accessing that payment.
- **Economic and forward looking adjustments** are used to support the welfare utilisation assumptions; to ensure the model reflects the current economic climate and can be used to understand the potential impact of changes to the external economic environment. Other forward looking adjustments allow for changes which have not been reflected in historic data, for instance if there has been a policy reform.
- **Economic assumptions** are used here for:
 - Indexation – consideration of how the average payments within each payment category will change in future years.
 - Discounting – developing lifetime costs as the net present value of the future payments. Discounting is used to adjust projected future payments to be in present values. This recognises the time value of money (i.e. 'a dollar today' is worth more than 'a dollar next year' as the money could be invested to earn income).

The considerations and approach used for developing each of these sets of assumptions is discussed in the remainder of this section and the main factors considered in each set of assumptions are listed in Appendix D.

5.2 Policy basis

The actuarial valuation reflects the policy as legislated at the valuation date. It assumes that these policy settings will persist in perpetuity.

This means that future changes in payment design or eligibility have been included in the valuation if the related legislation is in place; however changes that are still being debated are not included. By way of example, we have allowed for the increase in retirement age from 65 to 67 which will occur over the period from 1 July 2017 to 30 June 2023 and the change in pension asset test which will come into effect from 1 January 2017. However we have not included the parental leave reforms currently being debated.

Noting that most of the model assumptions are set by reference to recent experience, the general approaches used for implementing policy changes within the model are as follows:

Table 12: General approaches for modelling policy changes

Situation	Approach
Policy change is fully reflected in last 4 years of experience	No explicit adjustment needed as the reference period used already reflects the current policy settings.
Policy change is partially reflected in last 4 years of experience	Where possible reference the more limited time period of relevant experience, supported by additional information on the expected impacts and early experience provided by Departmental experts.
Policy change is not yet reflected in the recent experience	Explicitly adjust the prior experience to reflect the expected impact of the policy change.
Policy change had not yet taken effect at the valuation date	Explicitly adjust the prior experience to reflect the expected impact of the policy change.

We have summarised the main recent and future policy changes in Appendix A. The approaches used for implementing these within the model are as follows:

- Pension age changes have been modelled through explicit modelling of each individual's pension age and the setting of assumptions for the timing of entry onto the age pension relative to pension age.
- Changes to the pensions asset test have been modelled for age pensioners through explicit identification and allowance for people likely to exit aged pension at the point in time that this legislation takes effect; through adjustments to age pension entry rates applying after the change; and through adjustments to the average size of payments to pensioners remaining after the change.
- The replacement of the Student Start up Scholarship with the Student Start up Loan has been allowed for by only including an assumed bad debt allowance within the lifetime cost.
- The changes to Schoolkids Bonus and Income Support Bonus which have their last instalments in July and September 2016 respectively have been allowed for through adjusting the data to remove these payments from the relevant payment categories prior to the assumption setting and making an explicit adjustment to the future payments in the relevant payment categories to reflect the final instalments due in the first projection year.
- The cessation of Large Family Supplement with effect from 1 January 2016 has been allowed for through removing these payments from the relevant payment category prior to setting the payment assumptions.
- The cessation of Low Income Supplement with effect from 30 June 2017 has been allowed for through explicit adjustments to the level of payments in the relevant payment categories for the 2017/18 year onwards.
- Changes to the eligibility criteria and payment rates for FTB part B have been allowed for by adjusting the FTB data prior to the assumption setting to reflect the new payment criteria.
- Changes to Family Assistance Law affecting Child Care Benefit (CCB) approved Family Day Care (FDC) services and aimed at ending 'child swapping' have been allowed for through an overall adjustment to the assessed lifetime cost in respect of the other family payment category.

The adjustments have been developed to reflect the estimated direct impact of the change. No allowance has been made for any behavioural responses to the changes.

Changes since the baseline valuation

The main changes to the policy settings since the baseline valuation are the replacement of the Student Start up Scholarship with the Student Start up Loan; the cessation of the Large Family Supplement; the changes to FTB part B and the changes to the child care payment eligibility criteria.

The impact of these policy changes is discussed in the section 7.

Operational developments

Over the year from 1 July 2015 to 30 June 2016 there has been one main area of operational activity which has impacted the welfare recipient population and this relates to the Disability Support Pension. As part of the Disability Support Pension eligibility assessment process, the Department has been continuing the initiative to use contracted government doctors to conduct the Disability Medical Assessments.

- These assessments were first introduced as part of the process for new DSP claims from 1 January 2015 and have been fully implemented from 1 July 2015.
- A process of reviewing DSP medical assessments for current recipients under the age of 35 also commenced from 1 July 2014 and continued through the 2015-16 financial year.

This development has resulted in changes to the welfare population at 30 June 2016. In particular, as most of the people impacted started receiving Newstart in place of disability support pension there was a small reduction in the number of disability support pension recipients and an equivalent increase in working age payment recipients. While the assessments resulted in reduced numbers of DSP recipients, they did not directly impact the average payment levels for disability support benefits.

There have been a number of other changes taking effect over the year, such as the legislation to cap the deductible amount for defined income benefit streams and changes to the means test arrangements for Youth Allowance and Abstudy Living Allowance. Whilst a significant number of people had changes to their payment amounts the changes to the numbers of people receiving payments were relatively small (less than 0.5% of people in relevant classes).

5.3 Flow assumptions

Overview of demographic flow assumptions

Demographic models often focus on age and gender, with the driving events of births and deaths. While this model needed to consider these, it needed to do much more. As welfare entitlements are strongly related to household structures it was critical that the model properly emulate how such structures can change over time. Since the model simulates individuals rather than households, this means that the model had to consider the key household circumstances of each individual.

Within the model, the household structure is defined by the partnership status of the individual and the number and ages of children in their care, as well as the frequently different roles undertaken by men and women. The number of possible structures is substantial and hence the number of possible transitions is enormous. To make this manageable the model used a structural approach by considering:

- Changes in partnership status, that is, changes from partnered to single and vice versa. Given that payment eligibility does not distinguish between married and de facto partners, these have been considered together.
- Changes in care of children:
 - The possible reduction in the number of children in the care of an individual, such as through children becoming independent.
 - The possible increase in the number of children in the care of an individual. Where more than one child is gained, a distribution of ages is simulated. This process can model blended families as well as dependent children returning to the home. The specific case of gaining at least one child of age zero (a new birth) is considered separately to that of gaining children of other ages.

The simulation models the transitions in these characteristics for each individual in each future year, and uses the new household circumstances of the individual to influence future transitions. Note that the nature of the model means that one child may be recorded as being in the care of more than one individual, reflecting joint care.

A key contributor to these demographic flow models was the HILDA (Household Income and Labour Dynamics Australia) data that has tracked over 20,000 Australians over fifteen years, providing unique quantification of the changes that occur in people's lives. Departmental administrative data was also used to better characterise the experience of the population subsets of individuals receiving payments, and given the very substantial size of this dataset (circa 8 million people) it provided highly detailed information which could be referenced for establishing assumptions and as a constant cross-check for the HILDA data.

We have also modelled mortality and while it is not strictly a demographic property, it was appropriate to consider educational status in this part of the model. The approach for developing each of these characteristics is discussed in turn below.

Further, there are some characteristics which do not change over time (such as a person's country of birth) or change in a predictable way (such as a person's age) and these have also been considered in the simulation model as their effects can be modelled without requiring additional assumptions.

Mortality

Mortality, or the rate at which people die, is an important element of welfare and population projections. The longer people live, the higher the welfare lifetime cost.

Our approach to mortality assumptions is to cross reference existing published mortality tables where possible, subject to validation with experience from the Department's administrative data. Existing mortality tables contain rates of deaths by age and gender, with improvement factors to estimate the increasing life expectancy over time. The Australian Government Actuary (AGA) population mortality rates were adopted as a base assumption together with 25-year mortality improvement factors.

We then considered mortality differences for sub-groups within the population by undertaking a literature review of existing research. Guided by this, we analysed subgroups within the welfare recipient population that exhibit higher or lower than average mortality.

For a number of the classes the past mortality was observed to be significantly lower than that implied by the AGA or ABS tables. This was investigated and considered to be a result of underreporting of deaths in the administrative dataset. For example, FTB recipients with no obligation to report to Centrelink on a regular basis are more likely to not report a death when exiting the welfare system. We have accounted for this effect in developing our mortality and exit projections.

The analysis of population segment mortality rates has been extended at the 2016 valuation by:

- referencing the newly included information on the primary medical condition of disability support pension recipients to ascertain whether the mortality experience varies between people with different medical conditions; and
- considering the extent to which the mortality for the main population segments should be reduced to offset the higher mortality for Indigenous people and DSP recipients.
 - This analysis established that an offsetting adjustment would be appropriate up to age 80, but was not required at higher ages where population mortality is higher.
 - We also referenced external research⁴ on population mortality which considered the experience of different socio economic groups within the population and showed that it differed considerably.

The table below sets out the subgroups for which we have adopted separate mortality rates and details the rates adopted. Our adopted mortality rates for the various subgroups are based on the following reasons:

- Indigenous Australians experience significantly poorer mortality than the remainder of the population. Our approach references external analyses of Indigenous mortality.
- We recognise that the income support classes (excluding the age pension as a significant proportion of the post-retirement population have access to the age pension) would include an over-representation of the lower socio-economic groups who are demonstrated to have worse mortality outcomes than higher socio-economic groups. As such, we have applied mortality reductions only for people not on income support (other than the age pension).
- Disability Support Pension recipients were found to have higher mortality than population average. This was especially the case for people with cancer, and was also observed for other DSP recipients

⁴ ABS – Measures of Australia's Progress, 2010 – Socioeconomic Disadvantage (Catalog 1370.0)

NSW Public Health Bulletin Vol 12 No. 5 (<http://www.health.nsw.gov.au/phb/Documents/2001-5.pdf>)

Table 13: Mortality assumptions

Population segment	Sub-segment	Reasoning and approach	Adopted mortality rates
Disability Support Pension (DSP) recipients	All people with cancer	This group shows much higher mortality than population average and also higher mortality than DSP recipients with other medical conditions.	Observed mortality rates in the past experience.
	Non-indigenous people except those with cancer	This group shows higher mortality than population average.	AGA table loaded by age based factors developed by reference to the past experience.
	Indigenous people except those with cancer	This group shows higher mortality than population average and also higher mortality than Indigenous Australians in general.	ABS tables for Indigenous mortality rates loaded by age based factors developed by reference to the past experience.
Indigenous Australians (excluding DSP recipients)	People receiving income support (except those receiving the age pension)	Indigenous Australians experience significantly poorer mortality than the remainder of the population.	ABS tables for Indigenous mortality rates
	Other <i>These people are either not receiving any welfare or only receiving the age pension and/or non-income support payments</i>	This will include people in higher socio-economic groups who have demonstrated better mortality outcomes than lower socio-economic groups.	ABS tables for Indigenous mortality rates reduced for ages up to 80 by factors developed to ensure the overall Indigenous population mortality reflects the ABS Indigenous mortality tables.
Other Australians (excluding DSP recipients)	People receiving income support (except those receiving the age pension)	This is a substantial population group and will include many people in lower socio-economic groups who tend to have poorer mortality outcomes than higher socio-economic groups.	AGA table.
	Other <i>These people are either not receiving any welfare or only receiving the age pension and/or non-income support payments</i>	This is a substantial population group and will include many people in higher socio-economic groups who are demonstrated to have better mortality outcomes than lower socio-economic groups.	AGA table reduced for ages up to 80 by factors developed to ensure the overall population mortality reflects the AGA tables.

Given the importance and materiality of mortality to the overall level of welfare costs, we have conducted sensitivity analysis around the impact of adopting different assumptions. These sensitivity analyses are discussed in section 7.5, and illustrate the materiality of the mortality assumptions to the overall results.

This is an area that may warrant continued investigation and refinement in subsequent valuations.

Partnering

A person’s partner status is important in determining both their likelihood of accessing payments and the rate of payment applying. For example, the single person Age Pension is more than the partnered Age Pension.

As we know each person’s current partner status (partnered or not) we have developed models for the probability of a change in status in the next year. The models reflect the person’s characteristics, including age, gender, current partner status, Indigenous status and whether they have children.

A critical component of this analysis (and the other demographic sub-models) was the recognition that the probabilities of changes in partnership status differ by the welfare class of the individual. Given the reasons for these differences are complex to understand and model, separate models were created for each welfare class.

We have drawn on both the Department’s administrative data and the HILDA survey data in developing these assumptions, with the Departmental data being the main reference for the welfare recipient classes and the HILDA data being the main reference for the non-welfare recipient classes.

The overall structure of the partner models is unchanged from that used in the baseline valuation, however further work has been undertaken to refine and calibrate the models and to include further variables. The models have also been updated to reflect more recent data.

Children

Having children is also an important determinant of welfare use. For some payments such as Parenting Payment and Family Tax Benefit there is a direct link to both eligibility and payment levels. For other payments such as the Carers payment, having children increases the likelihood of accessing the payment. In other contexts the age of the youngest child often has a direct effect on the ability to work, particularly for women.

For each person in the model population we have included the children in their care in our model, together with their ages. Current children have been identified and included in the person level information. For the forward projection we have developed assumptions for changes to child numbers through use of a series of statistical sub-models reflecting:

- births (single and multiple);
- gaining one or more other dependent children; and
- losing one or more dependent children.

These assumptions allow us to model the number and ages of all the dependent children for each person in each future year. From that it is then possible to derive critical variables, such as the age of the youngest child or the number of children below a certain age that become inputs to subsequent stages in the valuation model. Children have been retained within the model up to the age of 24.

Importantly we have considered 'having recorded dependent children' rather than the natural process of having a child. By this we mean that individuals can take on new responsibility for the care of children as a result of adopting, fostering or helping care for children as well as through childbirth. Similarly people can stop providing care to children as a result of changes in family structures and responsibilities as well as through children leaving home. There may also be subtle differences between the information recorded for people and their actual situation, for example as a result of timing lags in the Department seeking and receiving updated information.

In general the data does not identify the precise nature of changes in child records but the statistical modelling is still able to replicate the relevant features of the changes. For example, the data clearly recorded situations where multiple children were added to an individual, with some but not all aged zero indicating new births. These presumably involve a blending of families occurring at the time of or close to a birth.

We have drawn on both the Department's administrative data and the HILDA survey data in developing these assumptions, with the Departmental data being the main reference for the welfare recipient classes and the HILDA data being the main reference for the non-welfare recipient classes.

The overall structure of the child models is unchanged from that used in the baseline valuation, however further work has been undertaken to refine and calibrate the models and to include further variables. The models have also been updated to reflect more recent data.

Educational attainment

Whilst there are no direct links to the payment system eligibility, a person's level of education is a predictor of their likelihood of drawing on the welfare system. Some people draw on the welfare system whilst undertaking a study program and conversely receiving payments while studying is likely to result in an increased educational level which may reduce the persons need for support in the longer term. Hence we have identified this as an important characteristic to include in the valuation model and have captured this through modelling each person's highest level of educational attainment.

This is a dynamic variable changing rapidly as people progress through their school years and potentially continuing to change, albeit at a slower rate, throughout their lifetime. As noted earlier this information has been collected for the majority of younger people in receipt of Commonwealth welfare payments but is missing for many older ones. We have imputed the values for those individuals with missing data. We have developed assumptions for how each person's level of education may change each year, reflecting their characteristics, including current education status, age and gender. Transitions in 'highest level of education' can only be upwards so special care was needed to ensure that the model was realistic with most individuals plateauing at a reasonable level of education, while at the same time reflecting the long term trend of increasing educational attainment in Australia.

We have drawn on both the Department's administrative data and the HILDA survey data in developing these assumptions, with the Departmental data (in the classes or age ranges where data was sufficiently complete,

such as for those receiving studying payments) being the main reference for the welfare recipient classes and the HILDA data being the main reference for the non-welfare recipient classes.

The overall structure of the education models is unchanged from that used in the baseline valuation, however further work has been undertaken to refine and calibrate the models.

Calibration of demographic models

The demographic models for partnering, children and educational attainment were initially developed as independent modules and then brought into the full model structure where they are used in combination with other model components, including the class movement assumptions and the population module.

One would expect that there would be relative stability or gradual trends in the mix of demographic characteristics observed for groups of people of similar ages and genders in each class. Trends in profiles may occur, for example, as a result of more people finishing school and progressing into further education for younger generations than their predecessors or as a result of demographic trends in average family sizes and the age at which people have children. Other factors, such as the proportion of 40 year olds who are partnered, may be more stable over time.

As part of the overall development of the valuation model the stability of each demographic variable and the need for calibration adjustments was considered. This was done by reviewing the forecast experience for people in different classes and age bands with different simulated characteristics in future years (a cross sectional analysis) and by reviewing how the experience at different ages compares for successive cohorts of people over time (a longitudinal analysis). Based on this assessment we have continued to include some small calibration adjustments, although the need for calibration has reduced following our model refinement this valuation. Census data was considered in checking the reasonableness of the adjustments made.

5.4 Welfare class movement assumptions

These assumptions are used to determine the likelihoods of individuals moving in and out of each welfare class. They are a key assumption in the model as they are used to determine each person's future trajectory and this reflects their expected interactions with the payment system.

We discuss the assumptions for movements from the active classes here and discuss the movements for people currently not receiving welfare in the New Entrant assumptions section below.

Approach

The movement to class 11 (dead) was modelled by simulating whether a person died using mortality rates and then referencing this event. As people would generally receive some payment in the year of death the class definitions mean that people would move to class 11 in the financial year following that of their death.

The movements to other classes were modelled for those people not moving to class 11 through developing assumptions as to their likely destination classes given the person's current characteristics. We developed these assumptions by reference to recent past experience and used a two stage approach in setting the assumptions:

- Firstly to set **foundation assumptions** which reflect each person's welfare class, age and gender only. These assumptions allow us to see the overall level of movements from each class, the main destinations and the extent of any variation from year to year. These assumptions have been discussed with the Department and the reasons behind any variations over time explored. We used this information to select an appropriate number of reference years for setting the assumptions, so that they reflect the expected future experience (given current policy). Unless policy changes or persistent behavioural changes have taken place we followed a general principle of setting assumptions following long-term trends in three-year average movements. Where there have been trends the assumptions were generally selected based on two-year average movements.
- The second stage is to set **risk based assumptions**. These reference more of the factors that influence which people move from within each class and hence provide assumptions which are more tailored to each individual's characteristics. Hence they provide greater differentiation between the outcomes and costs for different individuals in the system.

Assumptions

The risk factors considered in setting the assumptions include:

- Static characteristics (e.g. country of birth, Indigenous status)
- Demographic variables (e.g. age, gender, partner status, number of children, ages of children, interactions of age with the changing age pension qualifying age)
- Highest level of educational attainment
- The class characteristic variables added for people in classes 1-5 and 8 (e.g. DSP medical condition, care recipient medical condition, employment earnings indicator, payment type)
- Past welfare system information (e.g. duration in system, age at entry to system, duration in current class, previous class, details of past payment utilisation)

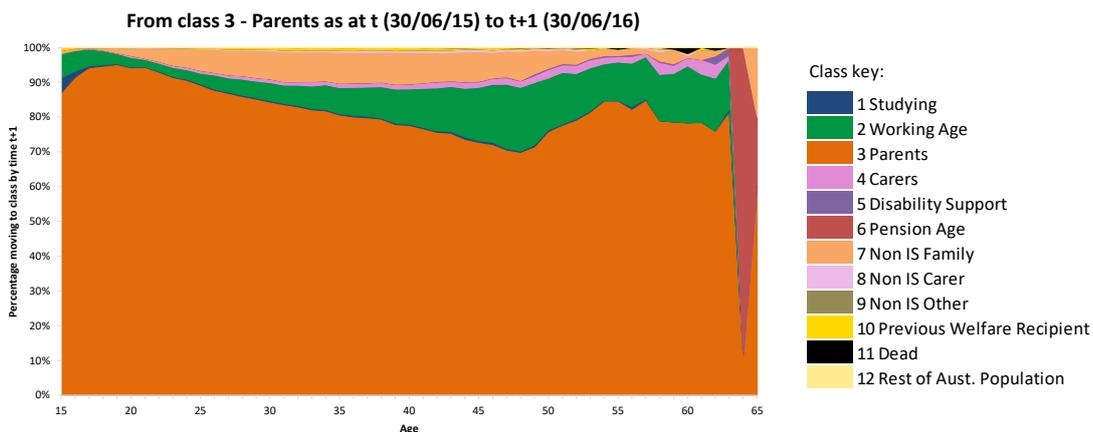
These risk based assumptions are established using statistical techniques. These are used to explore the relative importance of different characteristics on class movements and to develop multi-factor models which reflect each person's mix of characteristics.

The two stage approach is useful as the foundation assumptions capture many of the key features of the class experience and provide a point of reference from which to validate the risk based assumptions.

Example

The Parenting class provides a useful example to illustrate the approach. The chart below shows the single year movements for women in this class by age. This is the experience referenced in setting the foundation assumption.

Figure 12: Illustration of female single year movements from Class 3 – Parents



We can see the key features of the experience:

- A significant majority of these people stay in the class from one year to the next
- The main destinations are class '6 Pension Age' (for people at or approaching pension age); class '2 Working Age' and class '7 Non IS Family'
- The proportion of people leaving the class increases at older ages. This is not surprising noting that the eligibility criteria include having a qualifying child under age 8 for single parents or under age 6 for partnered parents.

In developing the risk based assumptions we considered additional factors including people's partner status, number and ages of children, educational attainment, whether they had employment earnings or not, and which other payment categories they utilised. These provide information as to whether the person is likely to stay in the class and, when they leave, the relative likelihood of exiting the system versus moving to other classes. This means the risk based assumptions used are more tailored to people's individual circumstances rather than being averages for their age and gender.

Adopted models

The main welfare class assumptions which have been adopted for the 2016 valuation vary by class, as follows:

- As for the baseline valuation, risk based assumptions were developed for each of classes 1-4, 8 and 9. These assumptions have been updated to reflect the recent experience and to consider the influence of the class characteristic variables modelled for classes 1-4 and 8.
- Risk based assumptions were newly developed and adopted for classes 5 and 7
 - For class '5 Disability Support', although only 1-2% of people move out of the class other than through retirement or death (both of which are modelled explicitly) the new information available in relation to the DSP medical condition warranted the exploration of the influence of medical condition on welfare outcomes and the development of a risk model which reflected this information.
 - For class '7 Non IS Family', we have also introduced a new risk model. This is a refinement introduced at this valuation which will help provide greater insights for this class.
- We have continued to retain the foundation assumptions as the final model assumptions for class 6 (age pension). For this class there is limited additional benefit of adding risk based models, having noted that less than 1% of age pensioners move out of this class other than through death.

For each class we have also reviewed the age range represented in the experience of each class and referenced the foundation assumptions in the regions where the data is sparse. Examples of this are for people aged 15 and under in most welfare recipient classes; for those below retirement age in class 6 (Pension Age) and for those above retirement age in classes 1 (Studying), 2 (Working Age) and 3 (Parents).

Changes since the baseline valuation

The main changes to the welfare class movement assumptions as a result of updating the experience underlying the assumptions are as follows:

- Lower transition assumptions into class '5 Disability Support' from most other classes, reflecting the continued tightening of DSP in recent years;
- A reduction in transitions into class '4 Carers', reflecting a slight but steady decrease in transition experience in recent years; and
- A recalibration of assumptions relating to class '9 Non IS Other' to reflect experience following recent policy changes made to the supplementary payments available to retirees.

5.5 New entrant assumptions

Approach

The approach for developing the new entrant assumptions is the same as that used for the class movements for the active welfare classes, with assumptions first being set at a foundation level and then refined by using statistical models to include a broader range of risk factors.

The probability of the re-entry of a past welfare recipient is generally higher than the probability of entry from someone in the rest of the population. As a result of this, different entry assumptions were selected for previous welfare recipients (Class 10) and the rest of the Australian population (Class 12). Once a person has been inactive for more than 10 years, we elected to use the same entry assumptions as for the rest of the Australian population (i.e. Class 12 entry assumptions). This was done in order to be more consistent with the historical data analysed; in particular noting that as there is only a limited period of data, the rest of the Australian population group in Class 12 includes some people who would have received welfare prior to the period of experience recorded in the data.

As would be expected there are clear age related trends for entries that depend on the typical pathways and life circumstances at the different age ranges. These features together with commentary can be seen in Figure 95 of section 11.2 and have been allowed for in the entry rate assumptions.

Adopted models

As for the baseline valuation, risk based assumptions have been adopted for both classes 10 and 12.

For past welfare recipients both the time since exit from the welfare system and the last active welfare class were predictive of the probability of re-entering. Recent welfare recipients are generally more likely to re-enter the system compared to other people and people are often more likely to re-enter a class they have previously

been in. Additionally, partner status, child information and highest level of education appear predictive of entry probabilities and so these were included as factors in all the entry rate assumptions.

For most classes the entry rates have been broadly stable over the last few years, or exhibiting very gradual trends and as a result entry rate assumptions were largely selected based on an average of the experience over the last 3 years, with the following main exceptions:

- Entry rates into Class 5 'Disability Support' have been decreasing over recent years, reflecting the tightened eligibility criteria and this had continued for the 2015/16 year. Following discussion with the Department, and recognising the immaturity of the 2015/16 year of experience Class 5 entry rate assumptions were selected based on the average of the experience in the 2014/15 year.
- The observed historical entry rates into Class 9 'Non IS Other' for people above retirement age have varied owing to the changes in composition of this class and the entry rates have been updated accordingly. The impact of this change is relatively minor owing to the older age range over which the change has been made.

Changes since the baseline valuation

The main changes to the welfare class movement assumptions as a result of updating the experience underlying the assumptions are as follows:

- A reduction in entries into class '2 Working Age', primarily from people who have previously been in the welfare system;
- A reduction in entries into class '5 Disability Support'; and
- A small reduction in entries into class '6 Pension Age' around retirement age.

5.6 Class characteristic variable assumptions

The new modelling variables which have been included at this 2016 valuation provide additional information which is useful in understanding the likely future welfare use and associated cost for people in the income support classes and the non income support carer class. These variables are listed in the table below.

Table 14: New class characteristic variables

Variable (Range)	Description	Variable type ¹	Relevant classes
Primary² Care Recipient Age	Age of primary care recipient at 30th of June each year. Age allowed to range from 0 to 110.	Deterministic	4
Primary Care Recipient Relationship	The relationship between the carer and primary care recipient. Relationship type grouped into Child, Parent, Partner, Other or Unknown.	Static	4
Primary Care Recipient Medical Condition	The medical condition of the primary care recipient grouped into one of ten categories. See below for details.	Static	4
Number of Adult Care Recipients	The number of adult care recipients. Banded to 0, 1, or more than 1 adults	Dynamic	8
Number of Child Care Recipients	The number of children care recipients. Banded to 0, 1, or more than 1 child	Dynamic	8
DSP Primary² Medical Condition	The primary medical condition of a disability support pension recipient grouped into one of ten categories. (See below for details)	Static	5
Employment earnings indicator	Indicator showing whether the welfare recipient earned any income over the year from employment. Either yes or no.	Dynamic	1,2,3,4,5
Payment Type	The most recent income support payment type the welfare recipient received relating to that welfare recipients class for the year. (See Table 5 for a list of relevant payment types).	Dynamic	1,2,3

Notes:

1. Dynamic variables are variables that are able to change from year to year, while static variables are only able to change upon entering the relevant class, remaining the same while in class. Deterministic variables are those such as care recipient age which are projected upon entering a class, but is then known each year thereafter. The variable type shown is that assumed for modelling purposes.

2. We have referred to the primary care recipient and primary medical condition; these variables reflect the main care recipient and the first listed medical condition information respectively for the relevant person in the administrative data.

Each of the class characteristic variables added to the valuation was modelled under the following broad structure.

- First, variable values for people newly entering the relevant classes are assigned. This is for people for whom the previous value is not relevant or unknown.
- Second the value for people remaining in the class or transferring between relevant classes which use the same variable information is updated. This may include a number of sub models allowing for different behaviours based on the previous value of the variable. For static variables the second stage this step is ignored and the variable value is retained without change.

Assumptions are required for each of these stages and further details are provided for each of the variables below. The assumptions have been developed by considering the recent past experience of people in the relevant classes.

DSP primary medical condition

This variable reflects the DSP recipients' primary medical condition. While there are a large number of underlying medical conditions, these have been grouped into a smaller number of categories for inclusion within the actuarial valuation model. The table below provides a summary of the categories together with the proportions of current DSP recipients with each condition.

Table 15: DSP primary medical condition categories

Medical condition category	Example conditions	% of DSP recipients
Circulatory & Respiratory System	Heart disease, Emphysema	5.8%
Musculo-Skeletal & Connective Tissue	Osteoarthritis, Fractures and crush injuries	23.1%
Cancer/Tumour	Cancer, Leukaemia, Hodgkin's Disease	2.5%
Other	Diabetes, Lupus, HIV, Coeliac disease, Hepatitis A	9.0%
Poorly Defined Cause / Chronic Pain	Chronic fatigue syndrome, Chronic pain	3.3%
Nervous System	Cerebral palsy, Motor neurone disease, Multiple sclerosis, Paraplegia	5.5%
Acquired Brain Impairment	Acquired brain injury, Toxic brain injury	2.7%
Psychological/Psychiatric	Autistic disorder, Depression, Post-traumatic stress disorder	32.9%
Congenital Anomalies & Inherited Disorders	Spina Bifida, Cystic fibrosis, Muscular Dystrophy	1.7%
Intellectual/Learning	Down syndrome, Fragile X syndrome	13.5%

The assumptions for people newly entering the Disability Support Pension class are based on peoples' age and gender, with those entering at youngest ages being more likely to have inherited disorders and intellectual disabilities. Psychological and psychiatric conditions at entry become more prevalent between ages 20-50 while the prevalence of cancers, circulatory/respiratory disorders and muscular-skeletal conditions dominate at older ages.

The DSP recipient's primary medical condition was treated as a static variable after as analysis demonstrated that this variable very rarely changes from year to year. Hence no further assumptions are required for those continuing in the class.

The likelihood of remaining on DSP varied by medical condition – recipients with musculo-skeletal conditions or cancer were more likely to leave DSP, whereas recipients with intellectual disabilities were more likely to remain on DSP.

Care Recipient variables

Carer IS (class 4)

The people in this class are typically caring for a single care recipient and hence the additional class characteristic variables selected to be modelled reflect information about the care recipient. Three variables have been modelled for people newly entering the class:

- **Primary Care Recipient Age:** this has been modelled based on the carers gender and age at entry to the class. This reflects analysis that shows that those taking on caring responsibilities at younger ages are most likely to be caring for a parent, at mid ages a child and at older ages a partner.
- **Primary Care Recipient Relationship:** this variable has been modelled based on the Carer's gender, age and the modelled age gap between the carer and care recipient. This recognised that the relative ages are a key determinant of relationship. Around 40% of current carers are partners of those they care for, 22% parents, 22% children and the remainder providing care to others such as other relatives.
- **Primary Care Recipient Medical Condition:** this variable uses the same medical condition categories as the DSP medical condition. The variable has been modelled based on the carers gender and modelled care recipients age at the time the carer entered the class.

For people continuing in the class the care recipient has been assumed to be the same person with the care recipients age being updated accordingly. The care recipients primary medical condition and care recipient relationship were treated as static variables as analysis supported that these variables very rarely change from year to year.

The care recipient variables provided additional information to predict which people were likely to remain in the Carer IS class. People caring for someone with cancer were more likely to leave the class, while those caring for a partner are more likely to be long term recipients of income support. The age of care recipient is also indirectly reflected in the class movement model through its influence on the care recipient relationship.

Carer Non IS (class 8)

The people in this class may be providing care to more than one care recipient and hence the additional class characteristic variables selected by the Department to be modelled reflect information about the numbers of adult and child care recipients. 40% of the people in the class are caring for one or more children only, 58% are caring for one or more adults only and the remaining 2% to both children and adults. 91% of people are providing care to a single care recipient.

For people newly entering the carer payment class these variables were modelled in the following order:

- **Number of child care recipients:** this has been modelled based on the carers gender and age
- **Number of adult care recipients:** this has been modelled based on the carers gender, age and the number of child care recipients.

Both of these variables are dynamic with the numbers of care recipients being subject to change from one year to the next. This requires further assumptions to update the variable information for the people continuing in the class:

- **Number of child care recipients:** this is updated based on assumptions which consider the carers gender and age and the number of child care recipients in the previous year
- **Number of adult care recipients:** this has been modelled based on the carers gender, age, number of adult care recipients in the previous year and the number of child care recipients in the current year.

Structuring the models in this manner allows for relationships between caring for adults and caring for children to be captured.

The number of care recipients added additional predictive power to the class movements model, with people having at least one child care recipient being more likely to move to an income support class (as opposed to those who only had adult care recipients, who were more likely to remain off income support or exit the welfare system altogether).

Employment earnings indicator

It was hypothesised that the future welfare outcomes for people with some work would differ from those with no workforce participation. Hence we added an employment earnings indicator into the model for people in classes 1 to 5. The table below provides a summary of the latest year of experience for people in the starting population by class.

Table 16: Summary of 2015-16 earnings indicator by class

Class	Proportion of people with earnings
1 – Studying	54%
2 – Working Age	48%
3 – Parents	35%
4 – Carers	16%
5 – Disability Support Pension recipients	12%

These earning indicators were added to the valuation and were modelled under the following broad structure.

- First, variable values for people newly entering one of the relevant classes are assigned. This is for people for whom the previous value is not relevant or unknown.
- Second the value for people remaining in the class or transferring between relevant classes is updated. This step includes the use of sub models which consider whether those people who previously had employment earnings still have earnings; and whether those people with no earnings still have no earnings.

Separate models were used to develop the assumptions for each relevant class, with a more sophisticated approach being used for classes 1 and 2 owing to their size, the mobility of people in these classes and the observed proportion with earnings.

- For classes 1 and 2 the assumptions were developed using risk based models which reflect a range of person characteristics.
- For each of classes 3, 4 and 5 a foundation approach was used with the assumptions reflecting the persons gender, age, previous class and previous employment earnings indicator (yes, no or unknown) only.

The employment earnings indicator was a strong predictor in a number of class movement models, but in particular for the Working Age class. People without employment earnings were more likely to remain on income support, while those with earnings were more likely to move to non-income support or off the welfare system altogether.

Payment type

Payment type has been added to the valuation model for the 2016 valuation to help understand the different welfare outcomes for people receiving the different main income support payment types. For instance, for the Parenting class we have considered the different outcomes for people who have received Parenting Payment Partnered versus those who have received Parenting Payment Single.

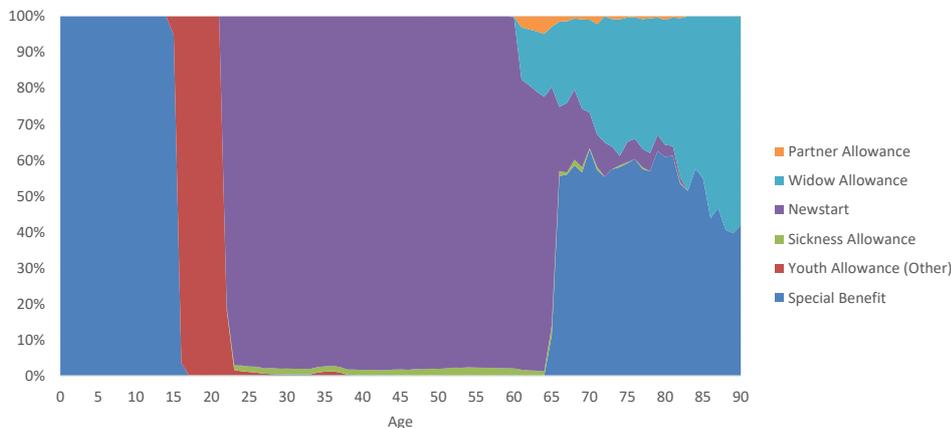
This variable has been modelled for the income support classes 1, 2 and 3 where there are a number of income support payment types which can result in people being assigned to that class. This variable is not modelled for classes 4 and 5 since there is only one payment type which assigns people to these classes. We have also not modelled payment type for class 6 since the vast majority of people in this class are age pension recipients.

The payment type model structures are different for each class and reflect the main drivers of people receiving each of the possible payment types:

- For class 1: an individual can receive either Abstudy, Austudy or Youth Allowance. There are age based eligibility criteria affecting which payments individuals are eligible for, hence a person's age and Indigenous status were key drivers of which payment type they received. The model structure used was:
 - For people newly entering this class, separate models were created for those identifying as Indigenous and those not identifying as Indigenous. Each model had separate assumptions reflecting the persons age and gender.

- For people continuing in the class, for each possible previous payment type, separate models were created for those identifying as Indigenous and those not identifying as Indigenous. Each model had separate assumptions reflecting the persons age and gender.
- For class 2: there are a greater number of different payment types which a person can receive with a person’s age being the main driver of which payment type they received. This is illustrated in the chart below which shows the proportions of people receiving each payment type at different ages.

Figure 13: Proportion of working age payment recipients receiving different payment types by age



As can be seen, for most ages there is a main payment type which dominates and then a smaller proportion of people receive other payments such as sickness allowance. The model structure focussed on differentiating the people receiving these other payments. The adopted structure is as follows:

- For people newly entering this class, a model with assumptions reflecting the persons age and gender.
- For people continuing in the class, sub models by payment type group which consider whether the person retains the same payment type or moves to a new payment type with the assumptions mainly reflecting the person's age, gender and previous payment type.
- For class 3: unsurprisingly, a person’s partner status was the key driver of which payment type they received. Hence the model structure used was:
 - For people newly entering this class, sub models for single and partnered people with the assumptions reflecting the persons age and gender.
 - For people continuing in the class, sub models for single and partnered people with the assumptions reflecting the person’s age, gender and previous payment type.

The payment type variable was most useful in class 2, where we found that people receiving Sickness Allowance had a higher likelihood of exiting working age payments (moving either to disability support or off income support). In the other classes, payment type was correlated with existing modelling variables such as age, Indigenous status and partner status. Nevertheless, adding these variables ensure that any payment type information reported is fully reflected in the class movement models.

5.7 Payment category utilisation assumptions

We modelled the payments to each person by considering for which of the 17 payment categories they receive any payment (the payment utilisation assumptions) and then the amount received in that category (the payment assumptions).

Approach

There are a large number of payment utilisation assumptions, reflecting each possible combination of active classes and payment categories. In practice this is simplified somewhat as some combinations are invalid (such as income support payments to non-income support classes) or everyone in the class receives a payment in certain categories.

We have retained the staged approach used for the baseline valuation in setting these assumptions:

- Firstly to set initial **foundation assumptions** for each payment category which reflect each person's class, age and gender. For income support classes these also reference the person's previous class.

These assumptions allow us to see the overall level of utilisation from each class, and the extent of any variation from year to year. These assumptions have been discussed with the Department and the reasons behind any substantial variations over time explored. We used this information to select an appropriate number of reference years for setting the assumptions, so that they reflect the expected future experience (given current policy).

- For the income support payment categories we noted that where people utilised secondary income support payments (for example a person in the Working Age class receiving some studying payments in addition to their working age payments) this was usually because they changed payment types and class during the year. The foundation assumptions for these payment categories therefore reference both the current and previous class in determining the utilisation.
- The second stage is to set **risk based assumptions** for some of the assumptions. These reference additional characteristics that influence whether people from within the class utilise each payment category and hence provide assumptions which are more tailored to each individual.

These risk based assumptions are established using statistical techniques. These are used to explore the relative effect of different characteristics on payment utilisation and to develop multi-factor models which reflect each person's mix of characteristics. The risk based assumptions are set with reference to the experience over the same time periods as used for the foundation assumptions.

In developing the risk based utilisation assumptions we considered a number of characteristics which drive people's likelihood of accessing each payment category. For some payment categories we referenced the specific factors which influence eligibility for payments (such as numbers of children within specified age ranges for FTB); for others we have reflected the extent to which people with different characteristics have shown a differing propensity to access each payment category. In this way the risk assumptions are more tailored to the individual than was the case for the foundation assumptions.

Refinement of utilisation modelling for payment categories H, I and J

At this valuation we have refined the foundation assumption setting for payment categories H, I and J. Where previously, the utilisation of these three categories were treated independently, the assumption selection now recognises that the utilisation of these three payment categories is actually interdependent. For example, of the Class 3 females aged between 30 and 50 who utilise payment category H, over half also utilise payment category I. Foundation assumptions have been set separately for each of the seven unique combinations of utilisation of H, I and J.

At the previous valuation, risk based assumptions were adopted for the utilisation of payment category H. At this valuation, we have extended the risk based models to apply for the utilisation of the seven combinations of payment categories H, I and J. Similar to the foundation assumptions, the risk based assumptions recognise the interdependence between the utilisation of the three payment categories. We focussed on those welfare classes with the highest utilisation of these categories, namely classes 2, 3, 7 and 9.

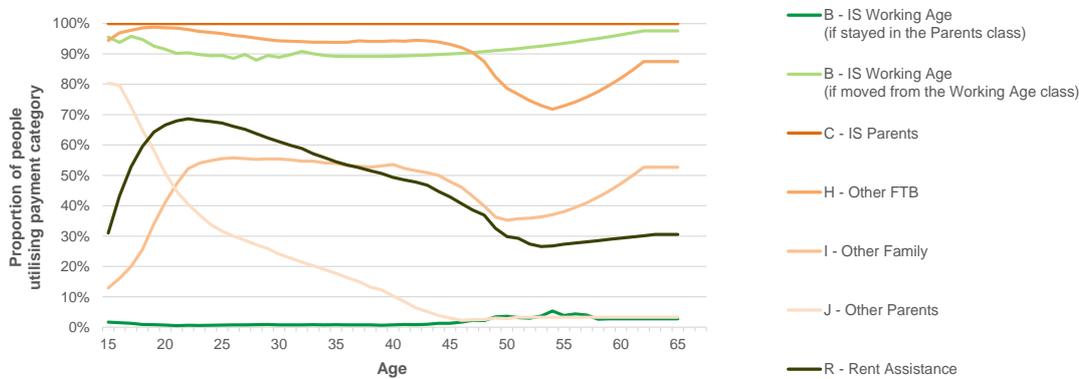
Selection of assumption approach

Risk based assumptions are not required where the foundation utilisation assumption is nil or 100%. Further, where the utilisation is close to either of these values the value of developing a risk based model is questionable and as such we have generally chosen to retain the foundation assumptions in these cases. This is the case for many of the supplements.

Example

We continue with our example of the Parenting class. The chart below shows the foundation payment utilisation assumptions for selected payment categories for women in this class by age.

Figure 14: Illustration of utilisation of selected payment categories for class 3 Parents (females)



We can see the key features of the experience:

- Everyone utilises payment category C (Parenting payment)
- The utilisation of other income support payments such as B – working age payments is nil or low if people have stayed in the Parents class from year to year, but high if people have moved from this class
- A majority of people also access FTB and about half access other family payments (primarily child care) with some variation by age
- A proportion access rent assistance with utilisation reducing by age
- A small proportion of people use payment category J, with a declining proportion by age

A risk based model is not required for payment category C as everyone in Class 3 uses this payment category, however risk models have been developed for income support payment categories H, I and J. The addition of risk models for payment categories I and J are a development on the previous valuation where foundation models were adopted for these payment categories. This means the assumed utilisation now more accurately reflects each person’s individual situation rather than being an average for someone of their age and gender within the class.

For utilisation of secondary income support payment types, the foundation models reflect class movements and perform well in identifying which people are likely to receive the secondary income support payment type.

At this valuation we have developed a risk model for the utilisation of payment category R for Classes 2, 3 and 7. Rent assistance was previously grouped with other allowances and supplements in a payment category with close to 100% utilisation. With rent assistance now identified separately, we have been able to develop a risk model that takes into account other characteristics such as age of children, earnings and partner status that help to identify the groups of people more likely to receive this payment.

Foundation models have been used for the other non-income support payment types. For some of these such as payment category P (which includes energy supplement) over 99% of people in income support classes utilise the payment category and hence the additional gain from a risk based model is minimal.

Appendix D includes a detailed table showing where risk and foundation assumptions have been used. Overall, the utilisation of 98% of income support payments and around 60% of the non-income support payments is either known by definition or has been modelled considering risk based assumptions, and the remainder using foundation assumptions.

Changes since the baseline valuation

The main changes to the utilisation assumptions as a result of the combined effect of policy changes and updating the experience underlying the assumptions are as follows:

- A reduction in the utilisation of category I payments in line with the phasing out of the Schoolkids bonus in July 2016
- A reduction in the utilisation of category N payments where experience shows the take-up rate of the Student Start up Loan has been lower than that for the Student Start up Scholarship. For class 2, the introduction of work for the dole in July 2015 has more than offset reductions due to the student start-up scholarship, resulting in an increase in the assumed utilisation of category N payments
- The utilisation rate for category P has increased as a result of the inclusion of more supplements such as the Energy supplement in this category. The Energy supplement was previously mapped to the now retired category K.

5.8 Payment assumptions

These form the second set of assumptions needed to determine the payments made to each person in each future year. They capture the amount of payments received given that the person has an entitlement.

The assumptions are set to reflect the expected 2016/17 payment levels; they are applied in combination with the assumptions for the changes to the level of payments expected in future years which are discussed in section 5.10.

General approach

There are a large number of payment assumptions, reflecting each valid combination of active classes and payment categories. We have again used a two stage approach in setting these assumptions: first foundation assumptions and then targeted refinement using risk based assumptions:

- The **foundation assumptions** are set for each payment category and reflect each person's class, age and gender.

These assumptions allow us to see the average level of payments made to people in each class, and the extent of any variation from year to year. These assumptions have been discussed with the Department and the reasons behind any substantial variations over time explored. We used this information to select an appropriate number of reference years for setting the assumptions, so that they reflect the expected future experience (given current policy).

- The second stage is to set **risk based assumptions** for some of the assumptions. These have been used in a targeted way to refine selected foundation assumptions.

These risk based assumptions reference more of the factors that influence the level of payments for different people in each payment category. They are established using statistical techniques and reference the experience over the same time periods as used for the foundation assumptions.

A large proportion of the total cost for people in any class is captured within a small number of payment categories. These typically include the primary income support payments and payment categories H – FTB, I – Family Payments and P – Other General Allowances (which contains the Pension Supplements and Energy Supplement). The other payment categories generally make a much lesser contribution to the overall costs.

In refining the payment assumptions by developing risk based assumptions, we have focussed primarily on the main income support payment types for each class. We have also developed risk based models for the larger non-income support payments and those for which annual payments vary considerably across the recipient population.

We have retained the foundation assumptions for some other payment categories as risk based assumptions add little when the annual payments to everyone within a class who utilises the payment are of similar size. We have also retained foundation assumptions if there have been significant trends in experience or policy changes which mean that the detailed past experience for the payment category is less able to represent the future experience under the current policy settings.

Further, where the drivers of the payment amounts are not well represented in the data, a risk based model may not substantially outperform the foundation model. Where we have seen little improvement in performance, we have generally chosen to retain the foundation assumptions.

Appendix D includes a detailed table showing where risk and foundation assumptions have been used. The risk based assumptions within the payment size models cover 98% of the income support payments and 86% of overall payments.

Overall across both the payment utilisation and payment size models the risk based models have been used for payment categories which cover 98% of income support payments and 49% of supplements and allowances.

Changes since the baseline valuation

Since the baseline valuation we have developed and adopted new risk based payment assumption models for payment category H for classes 2, 3 and 7 and for payment category I for classes 2 and 7.

At the current valuation, we have reflected the revised mapping of pension supplements and rent assistance by replacing the payment assumptions for K – Other Living with explicit assumptions for Rent Assistance and updated assumptions for P – Other General Allowances. The payment assumptions for P continue to be applied as a loading to the main income support payment for Classes 4, 5 and 6 and this year, we have also selected loading assumptions for classes 2 and 3.

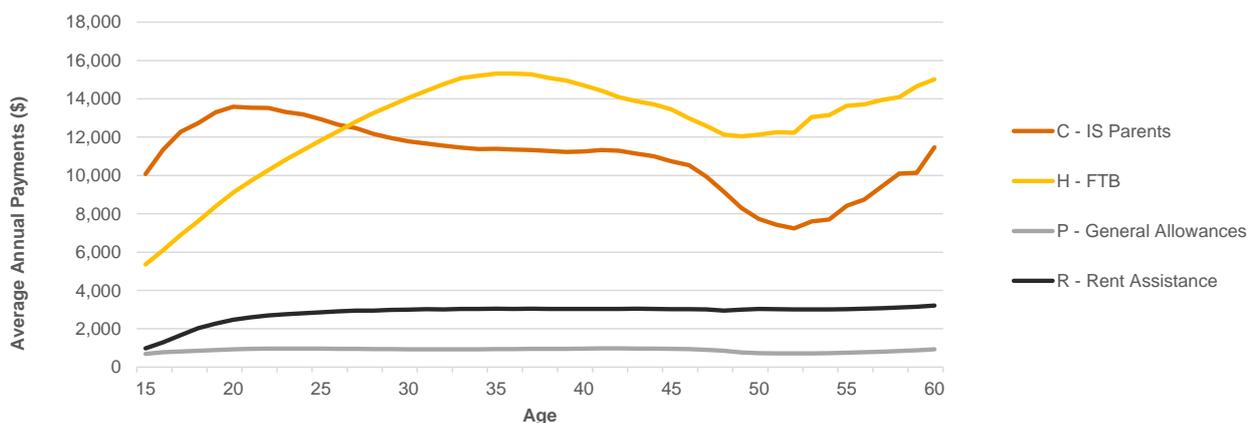
The main changes to the quantum of the payment assumptions as a result of allowing for the impact of policy changes on the payment assumptions and updating the experience underlying the assumptions are as follows:

- An increase in the average payment assumption for payment category I due to the removal of the Schoolkids bonus from this category which has a much lower average payment size relative to the other main payment type (Child Care Benefit) in this category. (Noting also that the removal of the Schoolkids bonus has resulted in a lower utilisation of this payment category.)
- A reduction in the average payment assumption for J due to the inclusion of the Baby Bonus in this category. As parental leave pay (the main payment type in J) and the Baby Bonus cannot be claimed for the same child, the increased utilisation of J combined with the lower average payment size of the Baby Bonus dilutes the average size of J payments.
- A reduction in the average payment assumption for N in line with adjustments made to reflect an assumed bad debt allowance in response to the replacement of the Student Start up Scholarship with the Student Start up Loan.
- The average size assumptions for P have been adjusted in line with experience with average payment levels increasing for Classes 2 to 6 and decreasing for the other classes. Category P has been impacted by mapping changes as discussed in section 3.2 and policy changes such as the phasing out of the pension bonus scheme payment.

Example

The charts below show the foundation payment amount assumptions for selected payment categories for women in the Parenting class by age. These amounts are conditional on a payment utilisation.

Figure 15: Illustration of payment category amounts for class 3 parents (females)



Looking first at the main parenting payment which is received by everyone in the class, we can see the average amount is lower at younger ages before peaking around age 20 and then decreasing until around age 50 and then rising again. This pattern is likely to be influenced by the mix of people receiving payments. Specifically the mix of:

- People receiving payments for the whole of the year vs. part of the year
- People receiving the single vs. couple rate
- People receiving full or part payments. This may perhaps also reflect the mix of parents vs. grandparents.

For the FTB payment shown above the general trend is an increasing one up to just before age 40 followed by reductions and then increasing again from around age 50. This is most likely reflecting changes in family and household composition as children are born, grow up and then leave the household. The other two payment supplement categories are of much smaller relative size and have somewhat lesser variability across the age range, most likely because the payment levels vary less with family size.

The risk based assumptions recognise the drivers of the differences in average cost for the main parenting payments in payment category C.

Age pension approach

The age pension payments represent a large part of the overall annual expenditure and form a significant part of everyone's lifetime cost, both for those currently in class 6 and everyone else who has some chance of entering class 6 in future.

The general approach for modelling the age pension has been retained from the baseline valuation, however the supporting assumptions have been updated to reflect new experience. The approach for allowing for the impact of the change to the pensions asset test in January 2017 has been refined to reference Departmental modelling of the initial impacts on the current age pensioner population.

The age pension payment model has three sub models which consider people's payment rates at the point of entry to age pension, the rates in the first full year on the age pension and then the rates in subsequent years. A range of factors are included in each model:

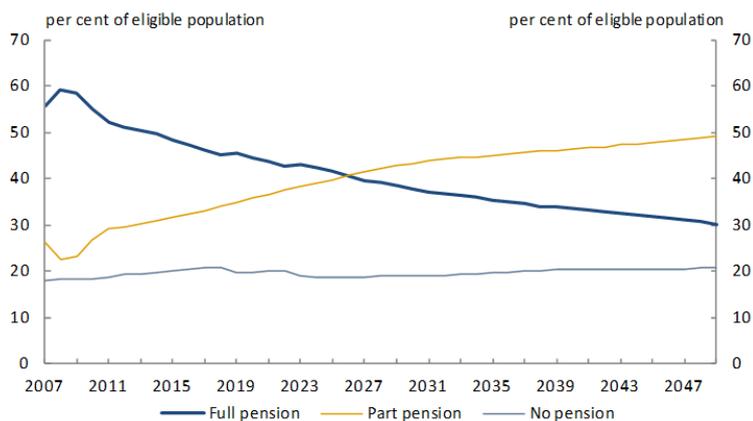
- The payment model at entry considers factors such as the person's age at entry, gender, partner status, their payment class prior to entry and their known time in the welfare system prior to entry
- The first full year on age pension model considers a similar set of factors; however the assumptions determined through this sub model are impacted to a much lesser extent by people being in receipt of payments for varying proportions of the year
- The subsequent year's payment model includes consideration of people's previous annual payment rate, duration in class, changes in partner status and whether they died during the year.

This model structure retains significant information about the actual payment rates applying to people currently in the class in developing the payment amount assumptions for future years. The age pension payment model includes two adjustments and these are discussed below.

Age pension adjustments

There are two trends in age pension experience that require adjustment in the forward projection:

- First, the possibility of an individual's assets eroding, or otherwise, as they age after retirement. This may generate a pattern of increased reliance on the aged pension as people get older. This may be compounded by life transitions such as changes in a person's health necessitating changes in living arrangements or losing a partner
- Second, the expected future trend of an increased number of part pensioners as people reach retirement with more superannuation assets. This is illustrated in the chart below.

Figure 16: Illustration of expected trend in part and full pensions

Source: Rothman, G. *Modelling the sustainability of Australia's retirement income system*, July 2012 Paper presented to the 20th colloquium of superannuation researchers

The valuation model assumptions include adjustments for both of these trends and these are consistent with the adjustments made in the baseline valuation.

For the first trend we have fitted the average payment size through explicitly identifying full and part pensioners in the current pensioner population and developing model assumptions which assign people to these groups when they first enter the Age Pension class. We have then allowed for the trend in increased age pension sizes by modelling how a proportion of people migrate from part to full pension as their retirement progresses.

For the second trend we have made a further adjustment to allow for an increased proportion of people newly entering age pension to be part pensioners. We sought a range of external information to support this assumption but have found no further evidence to quantify the magnitude of the likely shift in mix of the whole age pensioner population beyond that referenced in the baseline valuation.

We also note that, as was the case last year, the range of sizes of the possible impact will be confounded by the change in age pension asset test which might be expected to generate an increase in the proportion of full pensioners (as the asset free thresholds increase) and a reduction in part pensioner numbers (as the taper rate is doubled). The one-off impact of this change has been modelled explicitly and the future entry rate assumptions for time periods subsequent to the change recognise the change in criteria.

The change in mix of part and full pensioners will be further impacted by whether people's investments have and will produce returns at the rates previously assumed and by behavioural responses from people post and approaching pension age.

The combined effect of all of these considerations is challenging to model and subject to a material degree of uncertainty. As such we have continued to use the central scenario developed for the baseline valuation which we consider makes a reasonable allowance for this trend. We have considered the extent to which this scenario impacts the overall cost as part of the sensitivity testing performed on the model. The central scenario allows for an 8% increase in the proportion of new pensioners who are part rather than full pensioners to occur gradually over the period from 2017 to 2030. This timeframe has been selected as, by 2030, most new retirees will have had an opportunity to build superannuation savings over their full working lifetimes.

Over time, as new cohorts of pensioners retire we will be able to track the extent to which the experience is in line with the assumed trend and update the assumptions accordingly.

5.9 Economic and other adjustments

A number of adjustments are required within the valuation model framework to ensure the model provides an appropriate assessment of peoples future welfare use over their remaining lives and that this reflects current policy settings and the assumed future economic environment.

The adjustments include:

- Economic adjustments (introduced into the model for the first time at this 2016 valuation). This has been discussed in section 4.5.

- Forward looking (policy) adjustments (refined from the baseline valuation and updated to reflect current policy settings)
- Calibration adjustments (retained and refined from the baseline valuation).

The last two groups of adjustments are discussed in turn below.

Forward looking (policy) adjustments

Forward looking adjustments may be needed to ensure the model reflects the current policy settings (those legislated at the valuation date) rather than those reflected in the recent experience. For this reason changes may need to be made to the welfare class movement, class characteristic variables, payment utilisation and payment assumptions.

Our approach for these adjustments was developed after consideration of the main recent and upcoming changes to the payment system (see Appendix A). It has been refined since the baseline valuation and includes the elements described below.

For policy changes which took effect prior to the valuation date:

- Exclude any discontinued payment types which will not be available in 2015/16 or any subsequent years from the payment categories for which assumptions are fitted.
- For material policy changes, where practical adjust the historic data to reflect the current policy settings prior to fitting the assumptions
- Select appropriate reference periods for assumption fitting and explicitly calibrate the final assumptions to align with these selections:
 - Where possible develop assumptions with reference to periods of past experience which exclude periods impacted by policy change.
 - Discuss and review the assumptions jointly with Department staff to ensure drivers of variations in experience are identified and adjusted for as far as is practical.
 - Where no appropriate reference period is available, adjust the analysis developed from the historical experience using expert judgement.

For policy changes which will take effect after the valuation date:

- Model retirement timing based on each individual's actual pension age in order to allow for future changes to retirement age.
- Make explicit adjustments for major policy changes which form part of current legislation based on external information such as Departmental modelling and the information provided to support the relevant legislation. The approach for implementing these is developed on a case by case basis.

At this 30 June 2016 valuation we have allowed for a number of past policy changes in selecting assumptions based on the analysis of past experience. In particular we have continued to observe changes in rates of movements into disability support pension over recent years.

We have also made an explicit assumption as to the likely future utilisation and payments for payment category N – Other study and skills. The Student Start Up Scholarship was a core payment within this payment category and has now been replaced by the Student Start Up Loan. Our approach for determining the impact of this change is to reference the views of Departmental experts to form an initial view of the likely experience; this will be revisited in future valuations as the actual experience emerges.

We have also allowed for future policy changes including the change in retirement age from age 65 to age 67; the impacts of the changes to the pensions assets test which will take effect from 1 January 2017 and for the discontinuation of Schoolkids Bonus, the Income Support Bonus and Low Income Supplement.

Other adjustments

Benchmarking and calibration adjustments may also need to be made to reconcile aggregate projections of population characteristics with external benchmark sources, such as reports released by Treasury and the ABS and to ensure the model does not drift out of alignment over the long projection timeframe. They may also be used to adjust for other longer term trends that are not reflected sufficiently within the other assumptions.

For this 2016 valuation we included the following adjustments:

- Age pension adjustments (discussed in section 5.8)
- Demographic calibration adjustments (discussed in section 5.3)
- Alignment adjustments (discussed below)

Alignment of welfare class and new entrant assumptions

The welfare class movement and new entrant assumptions were initially developed as independent modules and then brought into the full model structure where they are used in combination with other model components, including the demographic, class characteristic, payment utilisation assumptions and the population module.

One would expect that, over time, there would be relative stability or gradual trends in the proportions of people transitioning from one origin class to different destination classes for groups of people of similar ages and genders in each class. Trends in profiles may occur, for example, as a result of the impact of policy changes leading to a change in mix of people in the class over time.

As part of the overall development of the valuation model the level of projected class movements was reviewed and the need for calibration adjustments considered. This was done by considering the forecast experience for people in different classes and age bands with different simulated characteristics in future years (a cross sectional analysis) and by reviewing how the experience at different ages compares for successive cohorts of people over time (a longitudinal analysis). Based on this assessment we have included a small number of explicit calibration adjustments in the final assumptions.

5.10 Economic assumptions

The lifetime cost will be estimated as the net present value of projected payments. Payments are expected to increase in each future year and the indexed payments will then need to be discounted or deflated to allow for the time value of money. The economic assumptions relate to both the rate of indexation of payments over time and the rate at which they are discounted to their present value.

Indexation assumptions

Indexation assumptions reflect how payments are expected to increase in each future year and are based on the relevant inflation index together with information on any planned changes to the payment structure or criteria. The assumptions will vary by payment category.

The relevant rate of inflation applied to the index is a function of the macroeconomic outlook. Accordingly, the assumptions are aligned with Treasury's forecasts and medium- to long-term approach for projecting price indices, as outlined in the 2016-17 Budget and 2015 Intergenerational report. Under this framework, the indexation rates are largely determined by the economic cycle over the short to medium term, but are fixed over the long term in line with economic fundamentals.

The valuation assumes:

- Short-term growth (up to 2017-18) consistent with 2016-17 Budget forecasts.
- Medium-term growth (from 2017-18 to 2022-23) consistent with published 2016-17 Budget projections to 2019-20 and interpolated for years between 2020-21 and 2022-23.
- Long-term growth in the Consumer Price Index (CPI) and the Pensioner and Beneficiary Living Cost Index (PBLCI) of 2.5 per cent per annum and Male Total Average Weekly Earnings (MTAWE) of 4.0 per cent per annum.
- Rates of increase in minimum wage in line with past experience.



The key economic assumptions are shown below:

Table 17: Indexation growth assumptions

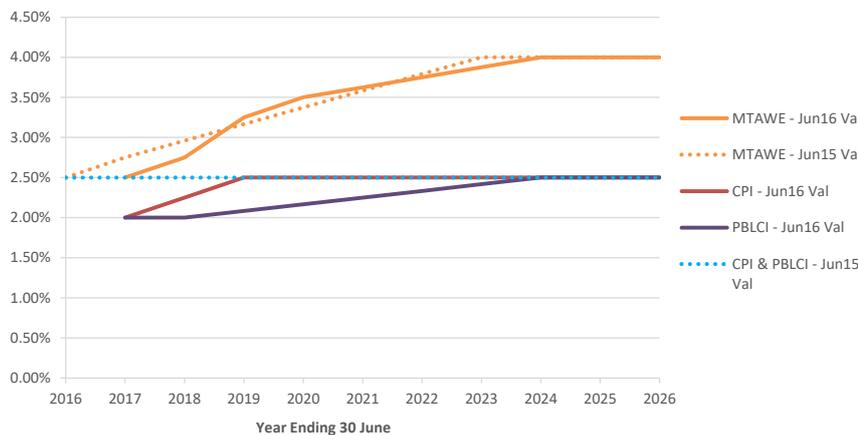
Indexation parameter	2016-17	2017-18	2018-19	2019-20	2020-21 to 2022-23	2023-24 to 2055-56
CPI	2.00%	2.25%	2.50%	2.50%	2.50%	2.50%
PBLCI	2.00%	2.00%	2.08%	2.17%	2.25% - 2.42%	2.50%
MTAWE	2.50%	2.75%	3.25%	3.50%	3.63% - 3.88%	4.00%
National minimum wage	2.41%	3.00%	3.00%	3.00%	3.00%	3.00%

Source: 2016-17 Commonwealth Budget, Budget Paper 1, Budget Statement 1, 2015 Intergenerational Report, and PwC analysis

Note that pensions are indexed by the higher of the movement in the CPI and Pensioner and Beneficiary Living Cost Index (PBLCI) and then this increase is benchmarked to a fixed proportion of MTAWE. Hence these assumptions are used in combination to determine the rates of future increase for pensions and, over the longer term, indexation will be in line with the highest of these assumptions.

The figure below compares the current valuation indexation growth assumptions to those adopted for the baseline valuation. The short term assumptions have reduced slightly for all three indices, however the long term forecasts are unchanged from the baseline valuation.

Figure 17: Indexation growth assumptions



Discounting assumptions

Discounting is applied to future payments to calculate a net present value. This provides an important reference point for applying and understanding the results of the investment approach. Discounting takes into account the time value of money, ensuring policy interventions can be identified and prioritised. It also allows discounted costs to be compared at different points in time to assess progress.

The overarching methodology, consistent with many other long-duration actuarial valuations in other Government contexts, is to ensure a long term stable gap between discount rates and inflation rates. Using a fixed long term gap minimises the chance of volatile changes in the valuation that are purely due to changing economic assumptions. Such movements would likely confound the purpose of the valuation and the communication of its headline results.

The valuation assumes a nominal discount rate of 6 per cent per annum, consistent with the rate used in valuing the Commonwealth’s defined benefit superannuation liabilities, and representing a longer term average of the 10 year government bond yield. This is the same rate as adopted in the baseline valuation. This rate will be revisited as necessary going forward taking into account prospects for a continuation of the prevailing low interest environment. These discounting assumptions have been adopted after consultation with the Department and the IDC.

The table below shows the proposed long term indexation assumptions for each of the indexation regimes as well as the discounting gap with the assumed discount rate of 6 per cent.

Table 18: Gap between discount rate and long term indexation assumptions

Indexation regime	Proportion of 2015-16 payments	Long term indexation assumption	Discounting gap (discount rate less indexation assumption)
CPI/MTAWE/PBLCI	55%	2.5/4 per cent	2/3.5 per cent
CPI	42%	2.5 per cent	3.5 per cent
National minimum wage	2%	3 per cent	3 percent
No indexation	1%	0 per cent	6 per cent

Sources: 2016-17 Commonwealth Budget, Budget Paper 1, Budget Statement 1, 2015 Intergenerational Report, and PwC analysis of Departmental data

6 Model population

6.1 Scope of population

The scope of the population for the 2016 valuation includes all Australian residents at 30 June 2016 and overseas welfare recipients who received a payment in the 2015/16 year.

Future migrants and unborn children are not included in the model, but will appear in future valuations once they migrate or are born, and at that time will contribute to an increase in the total lifetime cost.

The valuation model allows for the impact of future children on the likelihood and size of welfare payments for members of the model population, but does not estimate the future liabilities for the unborn children once they are eligible to receive welfare payments in their own right.

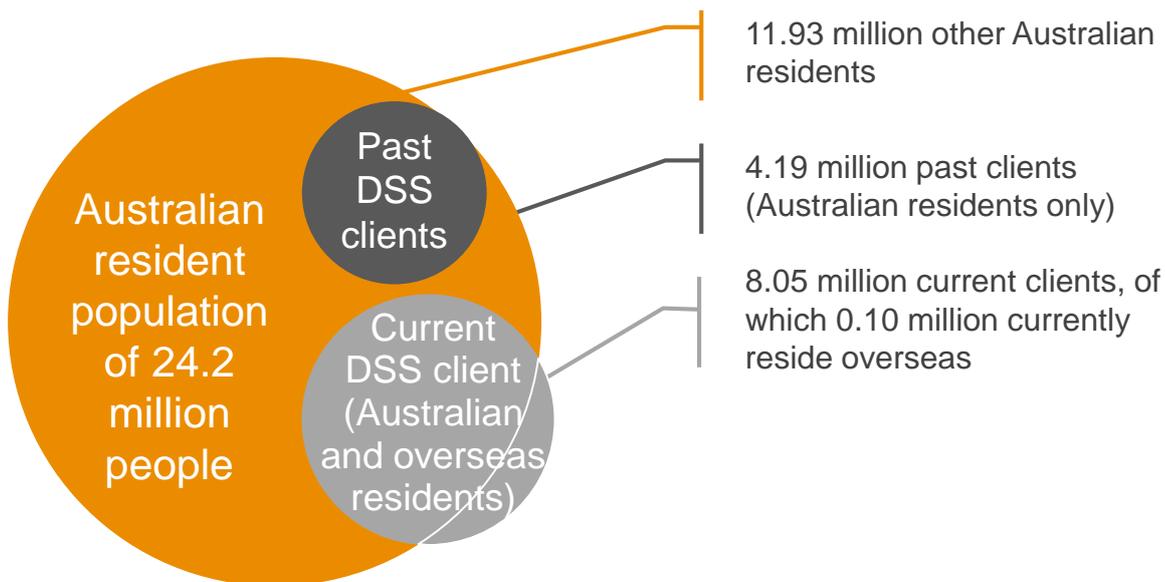
The valuation model allows for new entrants to the welfare payment system in each future year to be drawn from the model population, including existing children.

6.2 Summary of current population

The Australian estimated resident population at 30 June 2016 is 24.1 million people.⁵

The model population is 24.2 million people; this is slightly larger than the resident population owing to the inclusion of overseas residents who currently receive welfare payments as represented below.

Figure 18: Population at 30 June 2016



⁵ Source: ABS – 2015 estimated resident population projected to 2016 by PwC

6.3 Development of model population dataset

Australian resident population

A full synthetic dataset was developed to represent the 2016 Australian resident population. This was done by:

- 1 Expanding the 2011 Census sample population from 1% to 100%.
- 2 Adjusting the population from the enumerated population (those covered by the 2011 census) to the 2011 estimated resident population. This adjustment allows for people overseas on census night and for the net undercount in the census.

- 3 Adjusting the population further to represent the 2016 estimated resident population.

This step included adjustments for ageing the population and for changes arising from migration.

- 4 Enhancing the population using statistical imputation referencing external data to produce a synthetic dataset which is representative of the population.

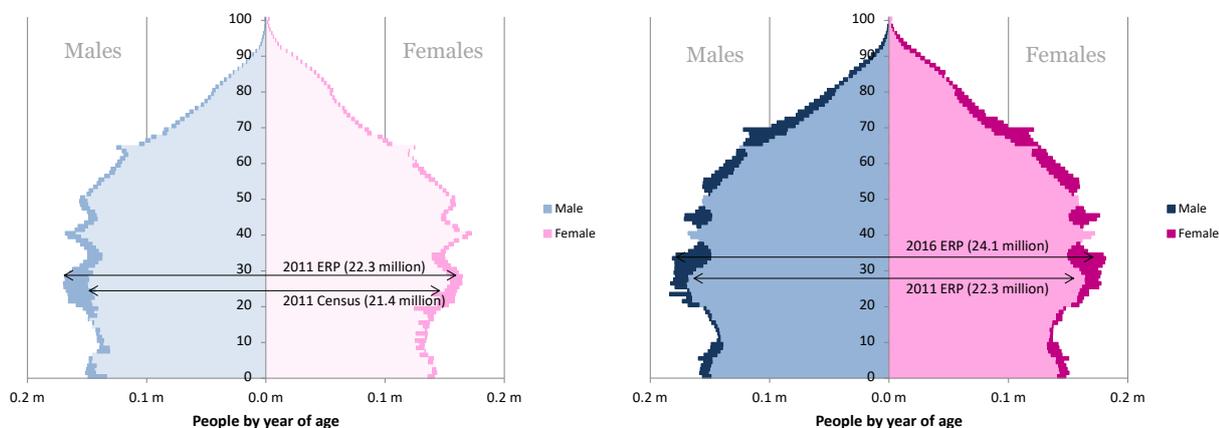
This step was required as some important characteristics were either not available or have limited detail in the original data. Specifically, Indigenous status was not available on the original data and so was imputed; age was expanded from 5 year age bands to individual ages and a more detailed location was also imputed.

Imputation was also used to establish variable information for individuals for whom the census response was 'not stated'.

This approach is unchanged from the baseline valuation, however the estimated resident population has now been developed to reflect the June 2016 population.

The populations generated through the first three steps of this process are illustrated below.

Figure 19: Illustration of creation of 2016 ERP (steps 1 to 3)



2011 census (light colours) => 2011 ERP (mid colours) => 2016 ERP (dark colours)

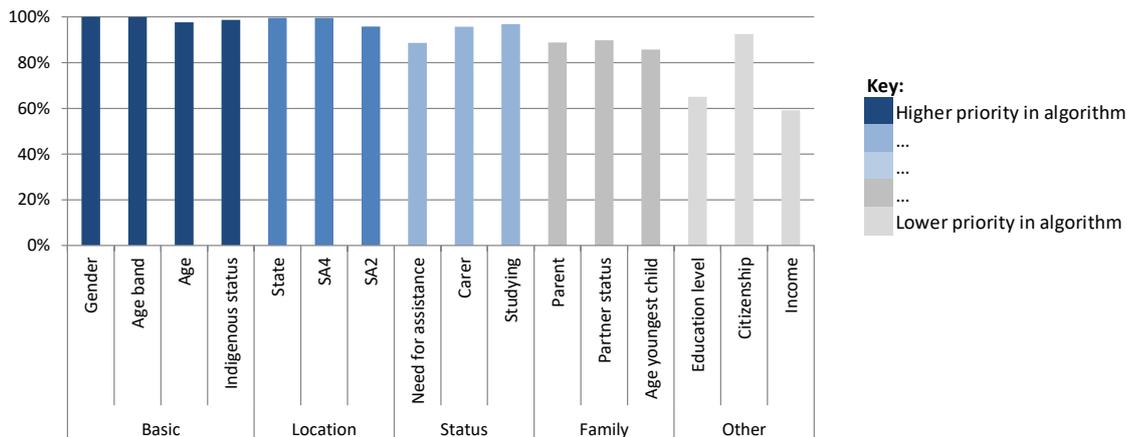
Model population

The model population data has been developed from the dataset with synthetic records for the 2016 estimated resident population and the latest data for people in receipt of Commonwealth welfare payments.

The development process was performed using an algorithm which replaced records for synthetic people in the population data with records for actual people in receipt of Commonwealth welfare payments. In deploying this algorithm a range of characteristics were considered in order to identify the best available records for replacement.

The figure below illustrates the extent to which records with common characteristics were identified for replacement.

Figure 20: Proportion of replaced records with common variable values



Owing to the synthetic nature of the population data and the likelihood of missing or inconsistent information in the data for people in receipt of Commonwealth welfare payments, we did not expect to achieve common values across all variables.

The objective of this replacement process was to ensure that both the component for people in receipt of Commonwealth welfare payments and the residual non welfare recipient component of the final population retained a realistic profile in terms of the important demographic characteristics.

As part of this stage of work we imputed a number of variables within the DSS records where the welfare recipient data had missing values by reference to the synthetic population data. The variable for which this step had the biggest number of imputed values was the level of educational attainment. This variable was complete for the majority of younger people in the DSS data but was missing for many older people.

Recent exits

Given the importance of previous welfare utilisation as an indicator of likely future welfare utilisation it is important to ensure the model population dataset identifies people who have recently exited the payment system.

In developing the population data records for this group there is a trade-off between retaining actual DSS records which have the advantage of being longitudinal but may now be out of date, and using synthetic population records which reflect the current population profile but lose the longitudinal information for the person who has exited.

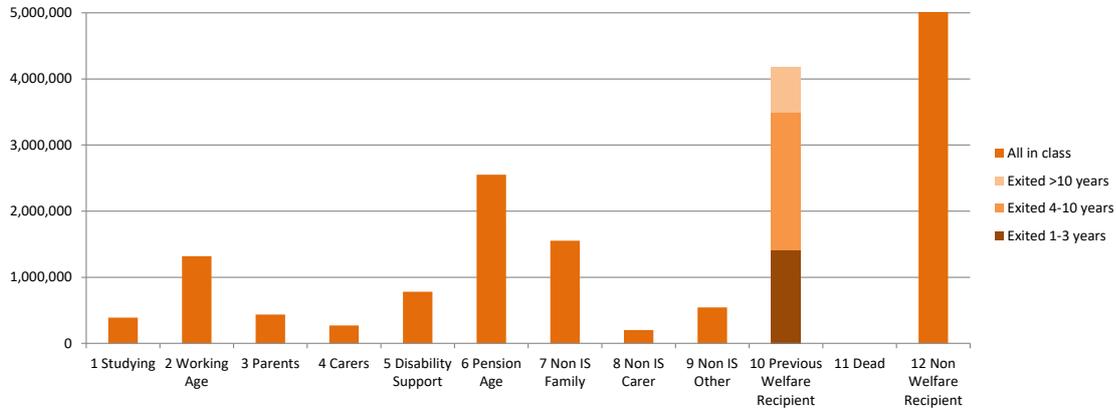
We have balanced these considerations and used the following approach to develop population records for this group:

- For people who exited within the last 3 years: we have referenced DSS administrative data directly in developing the population records. A similar approach as described above for current welfare recipients was used to replace synthetic population records with these records for recent welfare recipients.
- For people who exited the payment system more than 3 years ago: we have represented them by identifying synthetic population records with the same age, gender and Indigenous status and assigned past welfare history information to these representative records.

6.4 Summary of model population by class

The model population split by class is as follows.

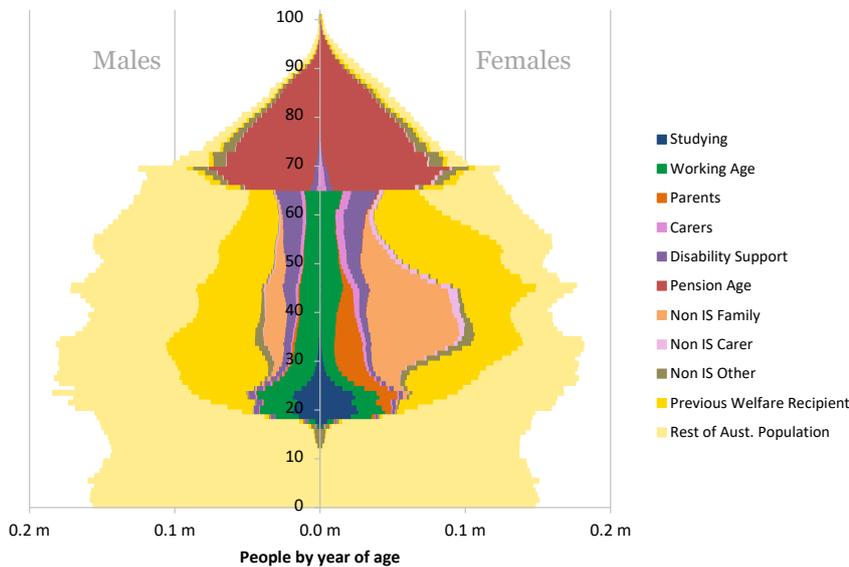
Figure 21: Model population by welfare class



Note: Class 12, the rest of the Australian population is much larger than other classes and has not been shown in full in the chart. It contains 11.93 million people

It is interesting to consider how the current welfare recipients relate to the whole population i.e. which groups of the population are people in receipt of Commonwealth welfare payments. We have used a population pyramid which shows the composition of the population by age and gender to illustrate which people fall into each class and to show the proportion of each group who are current welfare recipients.

Figure 22: Model population with class utilisation (June 2016)



We can see that:

- a large proportion of over 65's are people in receipt of Commonwealth welfare payments (as would be expected)
- people only generally access the payment system directly from their late teens onwards
- there is a significant group of women and a smaller group of men receiving Parenting payments or 'Non IS Family' payments (which is primarily FTB and/or child care payments)
- there is a slight increase in payment utilisation in the years leading up to retirement age

- there are other differences in payment system utilisation between genders – which may relate to the variation in roles performed by each gender, differences in longevity and differences in lifetime incomes.

6.5 Changes in welfare recipient population

In this section we review how the population of welfare recipients has changed over the past year. The table below provides a summary of the numbers of people in each class at 30 June 2015 and the subsequent change over the year to 30 June 2016.

Table 19: Summary of changes in welfare recipient population

Class	June 2015 Population (000s)	June 2016 Population (000s)	Difference (‘000s)	% Difference
1 – Studying payment recipients	392	390	-1	-0.3%
2 – Working age payment recipients	1,302	1,318	16	1.2%
3 – Parenting payment recipients	432	437	4	1.0%
4 – Carer payment recipients	265	272	6	2.3%
5 – Disability Support Pension recipients	813	782	-31	-3.8%
6 – Aged Pension recipients	2,495	2,551	56	2.2%
Income support recipient subtotal	5,699	5,749	49	0.9%
7 – Family Non IS payment recipients	1,547	1,554	7	0.5%
8 – Carer Non IS payment recipients	199	201	2	0.8%
9 – Other Non IS payment recipients	561	543	-18	-3.2%
Non Income support recipient subtotal	2,307	2,298	-9	-0.4%
Total welfare recipient population	8,006	8,047	41	0.5%

These changes reflect changes to both the underlying population size and demographics, as well as to the welfare system utilisation. The main drivers of the changing numbers for the income support classes are as follows:

- **Studying payment recipients:** the number of people in this class was expected to grow slightly, however there have been more exits than expected resulting in the size of this class remaining broadly unchanged from last year.
- **Working age payment recipients:** the numbers of people in this class were expected to grow over the year, with expected entries exceeding expected exits based on the past entry and exit experience in conjunction with the population demographics. The actual increase to the numbers of people was lower than these expectations with both the number of entries being slightly below expected and the number of exits being slightly higher.

It is also worth noting that people in this class are quite mobile with around a quarter of people in the class being expected to exit each year and a similarly substantial number of new entrants. The effect of small changes to the entrant and exit experience can have a significant effect on class numbers and we would expect this to be the main driver of the numbers of people in this class (rather than movements to and from other active classes). This is also likely to be one of the elements of the experience that changes most from year to year as a result of external environmental factors.

- **Parenting payment recipients:** the number of parenting payment recipients has increased by 1% since last year. This is primarily as a result of slightly lower than expected movements out of the class over the year.
- **Carer payment recipients:** whilst this remains one of the smaller classes, the number of carer payment recipients has grown slightly over the last year. This increase is in line with our previous expectation for this class where numbers were expected to grow if the recent class entry experience continued.
- **Disability Support Pension recipients:** the number of people in this class has reduced with the numbers of people exiting exceeding the new entrants. Exits are dominated by deaths, which have been in line with expectations and some transitions out of DSP and into working age as a result of the medical reviews are also evident. New entrant numbers are lower than past experience and this is likely to be the result of the tightened eligibility assessment process.

Model population

- **Aged Pension recipients:** the number of aged pensioners has increased, as was expected, with the main driver of this being the underlying population demographics.

The numbers of people in the family and carer non income support classes have increased slightly over the year and this is as expected given the slight growth in the overall population.

The number of people in the other non income support class has reduced. This is mainly driven by a reduction in the number of people above retirement age who were receiving supplementary payments only.

Overall, the 5,749,000 people who received an income support payment over the year to 30 June 2016 represented 23.8% of the population. This was a slight reduction from 23.9% at 30 June 2015.

7 Overall results

7.1 Total lifetime cost

The estimated total lifetime cost for the whole population as at 30 June 2016 is **\$4,514 billion** dollars. This figure is the net present value of the future in-scope payments expected to be made over the remaining natural lifetimes of the full model population. In calculating the net present value, the projected payments are discounted to current dollar values.

This is a substantial figure; by way of comparison the in-scope payments made in the 2015/16 year totalled \$111.5 billion. Hence the total lifetime cost is over 40 times the size of recent annual payments. Such a multiplier is perhaps not unreasonable given that we have included the age pension in the valuation, which a significant proportion of the model population are expected to receive in the future for many years post retirement.

Table 20: Summary of key valuation results

Population segment	Number in starting population	Average age	Total Lifetime cost (\$bn)	Average payment in 2015/16 (a)	Average lifetime cost (\$'000) (b)	Ratio = (b) / (a)	Expected proportion of future lifetime in IS classes
Current welfare recipients							
- Studying payment recipients	390,207	24	82	8,600	210	24	41%
- Working age payment recipients	1,317,538	39	401	11,300	304	27	61%
- Parenting payment recipients	436,585	33	207	29,700	475	16	64%
- Carer payment recipients	271,541	51	119	26,800	438	16	85%
- Disability support pensioners	781,816	50	352	22,100	450	20	96%
- Age pensioners	2,550,939	76	518	17,100	203	12	96%
- Family non IS clients	1,553,941	40	301	5,600	194	35	40%
- Carer non IS clients	200,678	51	41	6,900	206	30	44%
- Other non IS clients	543,327	54	74	2,800	137	49	40%
<i>Total current welfare recipients</i>	<i>8,046,572</i>	<i>53</i>	<i>2,095</i>	<i>13,800</i>	<i>260</i>	<i>19</i>	<i>60%</i>
Previous welfare recipients							
- Exited 1-3 years	1,418,858	40	242	n/a	170	n/a	41%
- Exited 4+ years	2,767,739	46	411	n/a	148	n/a	40%
<i>Total previous welfare recipients</i>	<i>4,186,597</i>	<i>44</i>	<i>653</i>	<i>n/a</i>	<i>156</i>	<i>n/a</i>	<i>41%</i>
Rest of Australian resident population							
- Rest of Australian resident population	11,929,432	28	1,766	n/a	148	n/a	35%
Australian resident population	24,162,601	39	4,514	n/a	187	n/a	42%

Notes:

1. The average payment in 2015/16 is understated owing to the data maturity issues with FTB and family payment data. This has a particular impact on the average payments for people in the family non IS and other non IS classes; we would expect these amounts to ultimately be larger than the figures shown.
2. Exited 4+ years refers to previous welfare recipients who have exited in the past 4-15 years

The above table shows the contribution of each class and population group to the total lifetime cost, which reflects the number of people in that class and their average lifetime cost. The average lifetime cost for people in each class is driven by the probability of an average person in that starting population entering, remaining in or leaving the system in each future year; combined with the type and amount of payments they are likely to receive. A few comparative indicators have been included in the table to help explain the results:

- The average age of the starting population is shown – obviously, younger people have a longer period over which they may receive benefits, but also a greater potential to move out of the system and become self-

Overall results

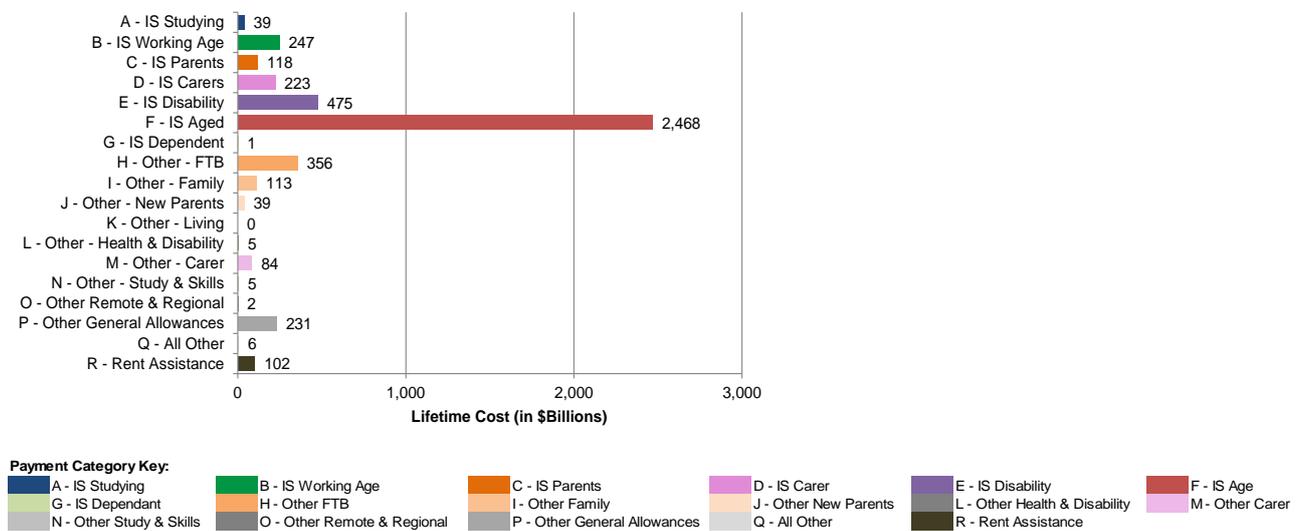
reliant at some stage, compared to older people. Also, the age pension costs for younger people are further into the future and so are lower as they are discounted more.

- The average total payment received by people in each class in 2015/16 is shown, which as can be seen is quite different by class, reflecting the nature and mix of the payments received by people in that class.
- The ratio of the average lifetime cost to the annual payment is shown for current welfare recipients – this ratio will reflect the average number of years on benefit projected for people in that class, along with the extent to which future payment levels will change based on people transitioning into different classes or changing their circumstances. For example, the age pension ratio of 12 would mainly reflect the number of years that the current population of age pensioners are likely to remain in receipt of payments, along with some variation in payment as people age and their circumstances change. The ratio of 24 for studying payment recipients would reflect the fact that while many in this class will exit the system within a couple of years, this is swamped by the long term cost of the people who transition to other classes after studying, or return to the system at a later stage of their lives, particularly as they retire and go onto the age pension.
- The expected proportion of future years in an income support class is provided as an indicator of the extent to which people in each class are expected to be self-sufficient over the remainder of their lives. We can see that aged pensioners and disability support pensioners are expected to receive income support for most of their remaining lifetimes and that the proportions are lower for those in other classes, especially those not currently receiving welfare payments.

Contribution of payment categories to total lifetime cost

Total lifetime cost is calculated as net present value of future in-scope payments made to all people in the model population over the remainder of their natural lifetimes. Given that a large portion of the model population is likely to receive the age pension in the future, the total lifetime cost is dominated by the age pension. The chart below illustrates how each payment category contributes to total lifetime cost.

Figure 23: Composition of lifetime cost (\$billion) by payment category

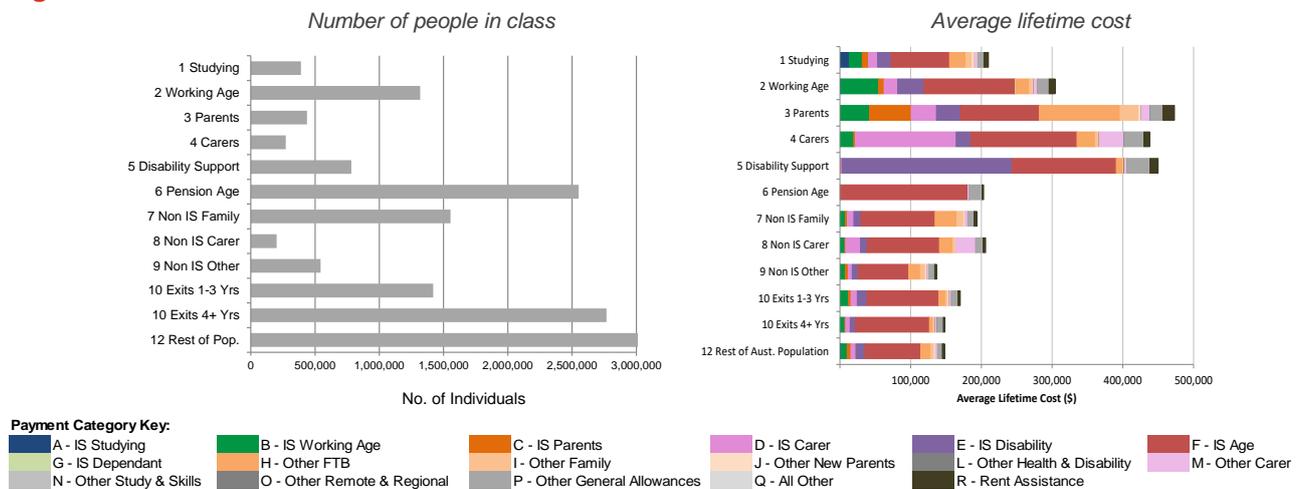


The largest contribution is from the age pension which represents 55% of the total lifetime cost. The next largest income support contributions are from the disability support pension and working age payment categories.

Overall results

The relative contributions of each class to the total lifetime cost are impacted by the numbers of people in each class as well as the average cost for each.

Figure 24: Drivers of welfare class lifetime costs



Notes:

1. The rest of the Australian population class contains 11.93m people and is not shown in full in this chart.
2. Exited 4+ years refers to previous welfare recipients who have exited in the past 4-15 years

From the total lifetime cost for current welfare recipients (shown in Table 20) and this information on the cost drivers, we can see that:

- The largest contribution is from people in the Age Pension class (\$518bn). This is primarily a result of the large number of people in this class; the average lifetime cost per person is less than for many other classes.
- The other classes of current welfare recipients with particularly large contributions to the lifetime cost are:
 - Working Age payment recipients (\$401bn) – this is driven by a combination of high numbers of people in the class, and a relatively high average lifetime cost per person
 - Disability Support Pension recipients (\$352bn) – this is driven by a combination of a high average lifetime cost per person, and the numbers of people in the class
 - Non IS Family payment recipients (\$301bn) – this is mainly driven by high numbers of people in the class
- It can also be seen that, along with Disability Support Pension, the Parents and Carers classes also have a high average lifetime cost per person. This reflects a mix of drivers including long durations in an income support class and the people in these classes accessing a broad range of payments

Despite having one of the lowest future lifetime costs per person, Class 12 Rest of Aust. Population accounts for almost 40% of the total lifetime cost for the model population. This is driven by the fact that this class makes up half of the model population.

7.2 Change since the baseline valuation

Introduction

Over the time from one valuation to the next we do not expect the total lifetime cost to stay the same. Changes will occur for a number of reasons including:

- Changes to the size and composition of the population
- Inflationary increases in the rates of payment. For instance, the basic fortnightly rate of the aged pension for single people was \$782.20 at 1 July 2015 and increased to \$794.80 by 1 July 2016 (an increase of 1.6%).
- Changes to the welfare payments arising from policy changes, and

Overall results

- Changes to both the current and expected future utilisation of each part of the welfare system.

Approach

In order to understand the overall change in the lifetime cost result we have considered each potential element of change in turn, exploring the change in results as the population information and each set of assumptions are updated to reflect the 2016 valuation data and assumptions.

Note that as all the valuation assumptions interact with each other this analysis is sensitive to the order in which the changes are made. For instance, the impact of updating the class movement assumptions for a class will be influenced by the numbers of people in that class and so will differ depending on the order in which the population information and class assumptions are updated.

This sensitivity to ordering is greater for the areas of change which interact strongly with each other (notably the demographic assumptions, class movement assumptions and economic module) and for the areas where the changes have the greatest impact. Changes that are specific to individual payment categories are typically less sensitive to the ordering of change as lifetime cost results are explicitly assessed for each payment category and the effects are more easily isolated.

In selecting an ordering we have recognised changes to the method and composition of the starting population first and then updated the assumptions about the future experience in the general order of the modelling sequence. The effect of introducing the economic module has been considered last in order to isolate the impact of this change.

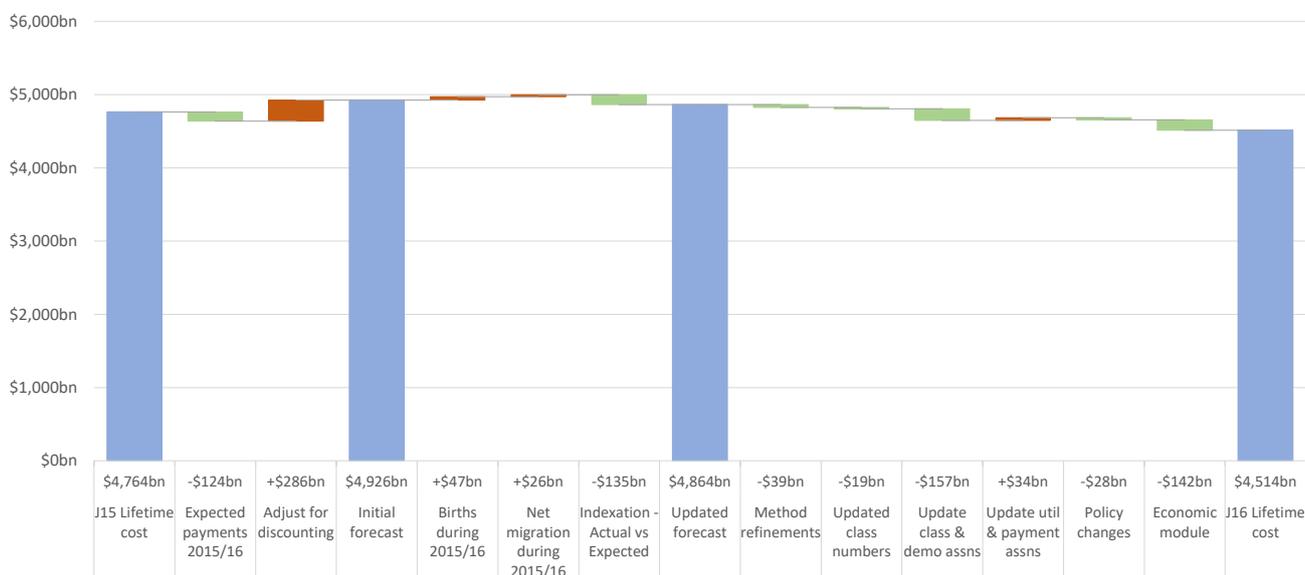
At this valuation the changes have also been confounded by the refinements made to the payment category definitions and across the modules of the valuation model.

As a result of these considerations this analysis should be considered as an attribution of movements rather than a strict process of changes seen at each stage.

Explanation of the change in overall lifetime cost

The figure below shows a breakdown of the movements in the total lifetime cost from June 2015 to June 2016.

Figure 25: Explanation of change in lifetime cost



The figure shows these movements in three stages which are discussed in turn below.

Initial forecast

As part of the work undertaken for the baseline valuation we provided a partial forecast of the expected lifetime cost at the 2016 valuation of \$4,926bn (an increase of \$162bn). This forecast provided information about what the result would be if the actual experience over the last 12 months was exactly in line with all the assumptions

made for the baseline valuation and there were no changes to the valuation assumptions about the future experience.

The forecast was based on the 30 June 2015 lifetime cost and allowed for the following adjustments:

- Expected payments during 2015/16 were deducted: These were deducted as only payments from July 2016 onwards are included in the lifetime cost at June 2016.
- Adjustment for discounting to 30 June 2016: This adjusted the lifetime cost to be in June 2016 'current dollar values' (rather than June 2015 'current dollar values').

The initial forecast was partial in that it only included information for the individuals who were part of the 2015 valuation population and expected to also be part of the 2016 valuation population. A complete forecast would need to include the full 2016 population, adding records for newborn children and those migrating into the country and removing records for those emigrating.

Updated forecast

As the first step of understanding the change in the lifetime cost result we have updated the initial forecast to take into account information on:

- Births during the 2015-16 year
- The changes in population at other ages based on the net migration
- Indexation of payments over the year – updating the indexation assumptions to reflect the actual indexation applied over the year and an updated view of future inflation

The impact of births and net migration are to increase the lifetime cost by \$47bn and \$26bn respectively. The actual indexation over the year has been lower than expected and so allowance for this has acted to reduce the lifetime cost by around \$135bn.

All of these elements are external to the welfare system itself and outside of the management control of the Department. This updated forecast is \$62bn lower than the initial forecast and provides a benchmark to which the 2016 valuation result can be compared.

Further changes in the assessment of June 2016 lifetime cost

The 2016 lifetime cost of \$4,514bn is a reduction of around \$350bn from the updated forecast.

This reduction arises as a result of a combination of changes which influence the valuation result. They include:

- Differences between the actual and expected experience over the 2015-16 year. This influences the numbers of people in each class of the population at 30 June 2016.
- Revisions to the valuation model assumptions which reflect:
 - Updated information on the actual experience, such as changes to the expected rates of movement between two classes or changes to the average amount of payments being received when people are in a particular class.
 - Updated information on external drivers of welfare utilisation, such as future unemployment rates
 - Changes to the policy settings
- Changes to the valuation model which are independent of the underlying experience and reflect the methodology improvements implemented at this valuation.

We included these changes within the following items in Figure 25, and further explanation is provided below.

- **Method refinements:** At this second valuation of the welfare system we have implemented a number of changes to improve the valuation model. These changes have been discussed in sections 4 and 5. They include the changes to the payment category definitions, changes to add class characteristic variables into the model and refined approaches to developing many of the underlying model assumptions. The overall effect of these changes is a lifetime cost reduction of **\$39bn**.
- **Updated number and profile of people in each class (compared to the expected position):** This allows for the number and profile of people in each class differing from what was expected based on the June 2015

valuation. In particular there were slightly less people than expected in some of the income support classes. This experience resulted in a decrease in the lifetime cost of around **\$19bn**.

The decrease in lifetime cost seen here is reflective of class transition experience over the last year differing from the assumptions used for the previous valuation. This experience has been used to form an updated view on future transitions and this results in a further decrease in lifetime cost as the updated view is flowed through to the class assumptions for the current valuation. This is discussed further in the point below.

The experience seen in this item also in part reflects the operational activity relating to the Disability Support Pension eligibility assessment process (see section 5.2). In particular we have seen a reduction in the number of people in the Disability Support Pension class and this has contributed to the decrease in the lifetime cost.

- **Updates to class and demographic assumptions (\$157bn decrease):** This component of the change reflects the updates made to the partnering, children and educational attainment assumptions and those made to the class movement assumptions. These updates reflect the latest experience captured in the administrative data and also reflect the explicit consideration of the impact of the new modelling variables on the class movements.

The impacts of the demographic and class movement assumption sets are closely inter-related owing to the iterative nature of the model, with changes in person characteristics influencing class movements which in turn influence expectations of the class movements the following year. The long-term nature of the model also means that the impacts are highly geared, with quite subtle changes in single year assumptions building up to material impacts when compounded over peoples full future lifetime.

Noting the very high number of individual assumptions within these assumptions sets (age-based assumptions for people in each class with each potential mix of risk characteristics) it is not practical to isolate the impact of every individual assumption change, however we have identified the main factors underlying the changes from these assumptions are:

- Around a \$40bn decrease from updating the demographic assumptions to reflect more recent experience. This included a decrease in the projected proportion of women with children, resulting in decreased projected numbers of people in Class 3 Parents and Class 7 Non IS Family.
- Around a \$70bn decrease from changes to entry rates of which the most significant change was a reduction in the assumed entry rate into Class '2 Working Age'.
- Other changes in the assumptions for movements from the active classes, including a decrease in the assumptions for the number of subsequent transitions into Class 4 Carers, Class 5 Disability Support and Class 8 Non IS Carer (around a \$40bn decrease).

The changes to the underlying assumptions are reflective of recent experience.

- **Updates to utilisation and payment assumptions:** Based on recent experience, there has been an increase in average payment sizes outside of changes which can be explained by movements in indexation. This may suggest that a higher proportion of welfare recipients have been receiving payments for the full year (rather than for just part of the year). In particular we have noted a trend of increased payment levels for working age payments (above the increases which would be expected due to payment indexation). The estimated impact of this is an increase in the lifetime cost of **\$34bn**.
- **Policy changes:** The reduction of **\$28bn** reflects the changes in policy settings which have occurred over the past year. The main elements of this are:
 - Family Tax Benefit Part B – primary earner income limit reduced from \$150,000 to \$100,000 per year (\$9bn reduction).
 - Removal of Family Tax Benefit Part B for couple families with a youngest child aged 13 and over (\$4bn reduction).
 - Cessation of the Large Family Supplement (\$4bn reduction).
 - Changes to Family Assistance Law affecting Child Care Benefit (CCB) approved Family Day Care (FDC) services (\$7bn reduction).
 - Student Start-up Loan (SSL) replaced the Student Start-up Scholarship (SSS) (\$4bn reduction).

At the previous valuation we made allowances for a number of upcoming policy changes including the pension age changes, changes to the pension asset test, changes to the Schoolkids Bonus and changes to

the Income Support Bonus. We have continued to make allowance for these and estimates have not changed substantially. As such these items do not make a material contribution to the change in the lifetime cost at this valuation.

- **Economic module:** the economic module is newly introduced at this valuation. The module itself has minimal impact on the valuation result, however in conjunction with introducing the module we have changed the assumption of the long term unemployment rate from an implicit assumption of being a continuation of recent experience, which has been around 6%, to an explicit assumption of a 5% rate. This suggests entries to the welfare system in future years will be lower than assumed for the baseline valuation and exits will be somewhat higher. The effect of this change is a lifetime cost reduction of **\$142bn**. This is discussed further in section 7.4 below.

7.3 Summary of overall change in lifetime cost

Total lifetime cost results

In this section we provide further information on the overall change in lifetime cost by showing how this can be broken into the change in population and the change in the average lifetime cost per person. This is effectively a simplified presentation of the changes outlined in the previous section, with these elements being aligned to give more of a focus on the impact of the changes rather than the specific model changes which have been made.

The total lifetime cost of \$4,514bn is a decrease of \$250bn (or 5.3%) compared to the baseline valuation. This was primarily driven by a decrease in the average lifetime costs of 6.4%, partially offset by an increase to the total population of 1.2%. The table below shows further details of this for the whole population.

Table 21: Change in overall lifetime cost

	Total	Income Support		Non-Income Support	
		Non Age Pension	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$4,764bn				
Jun-16 Total Lifetime Cost	\$4,514bn				
Change in Total Lifetime Cost	-\$250bn (5.3%)				
Change due to Population	+1.2%				
Change due to Average Lifetime Cost	-\$13k (6.4%)	-\$9k	< \$1k	-\$1k	-\$2k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economic module	-\$6k	-\$3k	-\$2k	-\$1k	< \$1k
- Impact of policy changes	-\$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of other changes	-\$6k	-\$6k	+\$1k	+\$1k	-\$1k

The population included in the model increased by 1.2%. The changes in welfare recipients for the year were discussed in section 6.5 and an increase of 0.5% was seen across all welfare recipients. The non-welfare recipient population increased by 1.6% as a result of the increase in the Australian estimated resident population.

The reduction in the **average lifetime cost** can be broken down as follows:

- The **change in inflation** encompasses an increase in the average lifetime cost as a result of inflation over the year (which brings the costs into June 2016 values), offset by a decrease in the lifetime cost as a result of a decrease in the expected future indexation allowed for in the projections. The overall impact of this on the average lifetime cost is relatively neutral.
- The impact of the **economic module** is a decrease in the average lifetime cost of around **\$6k**. As discussed in the previous section the main impacts of this were a decrease in the projected number of people in Class '2 Working Age', and a flow on decrease in the number of projected transitions from Class 2 into other income support classes including age pension, which results in a further decrease in the lifetime cost. The table above indicates that the main impacts are to the Income Support payments shown, which is in line with our previous observation.
- The impact of the **policy changes** is a decrease in the average lifetime cost of around **\$1k**. This reflects the changes in policy settings over the last year. The main changes relate to family supplements and the

Overall results

replacement of the Student Start-up Scholarship with the Student Start-up Loan. This was discussed in more detail in the previous section.

- The impact of the **other changes** is a decrease in the average lifetime cost of around **\$6k**. The largest driver of this is the changes to the class assumptions, which have led to a decrease in the projected number of people in Class '2 Working Age', 3 Parents, 5 Disability Support, 7 Non IS Family and 8 Non IS Carer. This item also incorporates the impacts of methodology changes and the update to payment and utilisation assumptions.

Class level lifetime cost results

The changes seen do not impact on people in each class in the same way. For instance, the reduction in future entry rates into the Working Age class has a much greater impact on people not currently receiving welfare than on current disability support pension and aged pension recipients.

Furthermore, when new predictive variables are introduced to the model, the impact is typically fairly neutral for the full population. However the new variables will result in more differentiation between those who are expected to have higher persistency in the welfare system and those who are expected to have lower persistency in the welfare system. The addition of the new variables this year has led to improved identification of groups within some of the income support classes (particularly classes 3, 4 and 5) who are projected to have higher persistency in the welfare system and this has led to increased lifetime costs for these classes. Conversely the new variables have also resulted in better identification of the groups of the population with lower expected persistency in the welfare system and a reduced lifetime cost for the non-income support and non-welfare recipient classes.

The table below shows a class level summary of the changes in population and average lifetime cost. These contribute to the total change discussed above.

Table 22: Summary of changes in lifetime cost by class

Population segment	Jun-15 Lifetime Cost (\$bn)	Jun-16 Lifetime Cost (\$bn)	Change in lifetime cost (\$bn)	Change in lifetime cost (%)	Change in lifetime cost – population change component	Change in lifetime cost – ave lifetime cost change component (%)	Change in lifetime cost – ave lifetime cost change component (\$'000)
Current welfare recipients							
- 1 Studying	97	82	-15	-15.4%	-0.3%	-15.1%	-37
- 2 Working age	410	401	-10	-2.4%	+1.2%	-3.5%	-11
- 3 Parenting	191	207	+16	8.6%	+1.0%	7.5%	+33
- 4 Carers	109	119	+10	9.0%	+2.3%	6.5%	+27
- 5 Disability Support	338	352	+14	4.0%	-3.8%	8.1%	+34
- 6 Pension Age	507	518	+11	2.2%	+2.2%	0.0%	< 1
- 7 Non IS Family	342	301	-41	-11.9%	+0.5%	-12.3%	-27
- 8 Non IS Carer	42	41	-1	-2.3%	+0.8%	-3.1%	-7
- 9 Non IS Other	87	74	-13	-14.8%	-3.2%	-12.0%	-19
<i>Total current welfare recipients</i>	<i>2,123</i>	<i>2,095</i>	<i>-28</i>	<i>-1.3%</i>	<i>+0.5%</i>	<i>-1.8%</i>	<i>-5</i>
Non welfare recipients							
- 10 Previous welfare recipients	680	653	-27	-4.0%	+7.0%	-10.3%	-18
- 12 Rest of Australian Population	1,961	1,766	-196	-10.0%	-0.2%	-9.8%	-16
<i>Total previous welfare recipients</i>	<i>2,641</i>	<i>2,418</i>	<i>-223</i>	<i>-8.4%</i>	<i>+1.6%</i>	<i>-9.9%</i>	<i>-16</i>
Australian resident population	4,764	4,514	-250	-5.3%	+1.2%	-6.4%	-13

This change in average lifetime cost is broken down below into the changes relating to inflation, changes relating to the economic module and other changes.

Table 23: Breakdown in average lifetime cost changes by class

Population segment	Change in lifetime cost – ave lifetime cost change component (\$'000)	Impact of change in inflation on ave lifetime cost (\$'000)	Impact of change in economic module on ave lifetime cost (\$'000)	Impact of policy changes on ave lifetime cost (\$'000)	Impact of other changes on ave lifetime cost (\$'000)
Current welfare recipients					
- 1 Studying	-37	< 1	-14	-3	-21
- 2 Working age	-11	< 1	-13	-1	+3
- 3 Parenting	+33	< 1	-9	-6	+48
- 4 Carers	+27	< 1	-4	-1	+31
- 5 Disability Support	+34	< 1	< 1	< 1	+33
- 6 Pension Age	< 1	< 1	< 1	< 1	< 1
- 7 Non IS Family	-27	< 1	-7	-2	-19
- 8 Non IS Carer	-7	< 1	-3	-1	-3
- 9 Non IS Other	-19	< 1	-4	-1	-13
<i>Total current welfare recipients</i>	-5	< 1	-5	-1	+1
Non welfare recipients					
- 10 Previous welfare recipients	-18	< 1	-7	< 1	-11
- 12 Rest of Australian Population	-16	< 1	-7	-1	-8
<i>Total previous welfare recipients</i>	-16	< 1	-7	-1	-9
Australian resident population	-13	< 1	-6	-1	-6

As can be seen from the tables above, the majority of the overall \$250bn decrease in lifetime cost is for **non-welfare recipients** (classes 10 and 12) which showed a decrease of **\$223bn**. This is the result of a \$16k (or 9.9%) decrease in average lifetime costs, partially offset by a 1.6% increase in the population in these classes. The decrease in average lifetime cost is as a result of the impact of the economic modules and the other changes, which were discussed above. Together these factors have reduced our assessment of the proportions of time that people in these classes may receive income support in future.

The change in the lifetime cost relating to current welfare recipients was a decrease of **\$28bn** or 1.3%. This is driven by a \$5k (or 1.8%) decrease in the average lifetime cost, partially offset by a 0.5% increase in the welfare recipient population.

- At an overall level the \$5k decrease in the average lifetime cost of the current welfare recipients is driven by the impact of the economic module. The largest impacts of the economic module can be seen for studying, working age and parenting payment recipients. This is because these groups have a relatively high chance of using working age payments in future and so are most impacted by the changes in projected unemployment rates.
- The impact of the policy changes over the year resulted in a decrease in the average lifetime cost of \$1k for current welfare recipients. The main policy changes relate the family supplements and the replacement of the Student Start-up Scholarship with the Student Start-up Loan. The largest impacts can be seen in classes 1, 3 and 7.
- The impact of the other changes varies considerably across the different classes:
 - The other changes have resulted in an increase in the average lifetime costs for classes 3, 4 and 5. This is in part a result of an increased persistency for people currently in these classes as a result of including new predictive variable information in the model, as discussed above.
 - The other changes have resulted in a decrease in average lifetime costs for classes 7, 8 and 9. In particular we have seen a decrease in the lifetime cost for working age income support payments for this group. This is, in part, a result of this group being less likely to exit the welfare system and later re-enter into the Working Age class following the decrease to the entry assumptions into that class.
 - For similar reasons the other changes have resulted in a decrease for class 1, since people in this class are typically young and likely to exit the welfare system at some point in the future.

As can be seen above there is some class level variation in the change in population over the year. Notably the number of people in the Disability Support Pension class has reduced by 3.8% which is likely to be in part a result of the tightened eligibility assessment process which has reduced the number of new entrants into this class. We also note that there has been a 2.3% increase in the number of people in the Carer class – this growth is in line with recent experience.

We have included further commentary on the changes in population and average lifetime cost in the discussion of the results for each class in sections 8, 9 and 10.

7.4 Impact of the introduction of the economic module

The economic module adjusts the results of the model to be more reflective of economic conditions expected over the long term timeframe covered by the model.

The selected central assumption allows for the expected impact of the unemployment rate decreasing from its current level of around 6% to a long term assumption of 5%. This compares to the implicit assumptions used in the baseline valuation of the future economic environment being similar to recent experience. This change results in a decrease in the lifetime cost of \$142bn, compared to the lifetime cost before this adjustment. The main reasons for this decrease in lifetime cost are:

- A decrease in the projected number of people in Class '2 Working Age', as a result of decreased projected entries into this class and increased projected exits out of the class.
- The flow on effect of less people being projected to transition from Class 2 into other income support classes, which results in a further decrease in the lifetime cost.
 - This includes a reduced rate of future utilisation of the age pension, since analysis has shown that people not receiving income support payments are less likely to draw on the age pension later in life, most likely as they will have greater opportunity to save to become self-sufficient in retirement.

The selection of a long term unemployment rate of 5% is a key area of judgement and has a significant impact on the lifetime cost. We have set out the impact of possible alternative scenarios below.

Table 24: Sensitivity of current liabilities to changes in economic module assumptions

Long term unemployment rate assumption	Change in lifetime cost, non-Age Pension component	Change in lifetime cost, Age Pension component	Total change in lifetime cost (\$)	Total change in lifetime cost (%)
4% (1% decrease from base assumption)	-\$78bn	-\$38bn	-\$116bn	-2.6%
5% (base assumption)	-	-	-	-
6% (1% increase from base assumption)	+\$99bn	+\$41bn	+\$140bn	+3.1%
7% (2% increase from base assumption)	+\$213bn	+\$80bn	+\$293bn	+6.5%

The scenarios above show a range of lifetime cost impacts from a reduction of \$116bn based on the lowest unemployment rate scenario shown, to an increase of \$293bn based on the highest unemployment rate scenario shown.

7.5 Areas of sensitivity and uncertainty

Limitations of the valuation

The valuation explores the cost of future welfare payments over the remaining natural lifetimes of the model population on the basis that the currently legislated policy persists over that timeframe. Whilst this exercise is intended to provide useful information it is important to understand its limitations.

The payment system changes frequently. Hence the scenario contemplated in the valuation of current policy continuing will be unlikely to eventuate in practice. As time progresses further into the future, the potential for different policies to be put in place is greater and so differences between actual and projected payments are likely to be larger.

The valuation explores the use of the welfare system allowing for expected demographic changes and considering the broader economic environment. Other external factors may influence the demands on the system. These factors extend as far as changing patterns of life and work; changes in the composition of

households; changes in mix of industries and work opportunities; impacts of trends in population health and healthcare driving changes in demand for supports and behavioural changes from individuals and in terms of the informal supports provided between members of different generations. The extremely long term nature of the projected payments within the model means that all these factors and others that we have not yet contemplated are likely to influence the use of the welfare system in future years and hence impact the liabilities. We have not considered such trends explicitly.

Uncertainty

For each person, their actual life outcomes and the welfare payments received are uncertain. This is reflected in the assumption sets adopted in the valuation model which are probabilities of different events occurring throughout people's lives and the likely costs of the resultant life trajectories. For each group of people and the population as a whole the valuation results presented above represent the mean of the lifetime costs derived from the range of modelled future outcomes.

Many of the assumptions underlying the actuarial valuation are developed by considering patterns of past use of the welfare system. In some cases the past experience has been volatile and in others the experience has varied from year to year, most likely as a result of policy changes. Some policy changes are recent and not fully reflected in the observed experience; people may also behave differently in the future than they have in the past. These considerations mean that the assumptions are inherently uncertain and the actual future experience may differ from that modelled.

The long term nature of the lifetime cost results means they are highly sensitive to some of the assumptions. In particular:

- The assumed mortality rates and mortality improvements have a systemic impact on the whole population. Small changes to future mortality rates mean that, on average, people receive the age pension for a different length of time and this can impact the lifetime costs materially.
- The inflation and discounting assumptions also have an extremely large impact on the lifetime cost results. Many of the payments are not received until many years into the future and for some of the population are concentrated in the latter part of people's lives. This means small changes in the indexation and discount rates can have a large impact on the lifetime cost.

The impact is greatest for changes to the discount rate as this impacts all future payments over all timeframes. It is greater for changes to MTAWA than changes in the CPI as the payments that occur later in people's lives are indexed by MTAWA and hence have a longer average duration.

An important part of the analysis has been to use risk based assumptions to achieve a differentiation in the lifetime cost results for different groups of the population, with these being more reflective of their underlying risk profile, to the extent that this is captured within the variables modelled. The differentiation has been improved at this valuation with the inclusion of a number of class characteristic variables.

Whilst the use of risk characteristic variables improves the explanatory power of the modelling, and has been extended since the baseline valuation, the analysis demonstrates that not all of the variation in welfare utilisation for different people can be explained by the risk characteristics included. Although there may be opportunities to continue to include some further variables in future valuation there will be a limit to the extent to which variation between groups and individuals can be explained.

A number of the risk based characteristics are dynamic in nature. Examples in the valuation include educational attainment, partnering status, number and age profile of children, and details of care recipients. Quite small variation in adopted parameters can have a significant compounding effect over the long periods of time projected. An important validation step has been to check the reasonableness of the distributions of these parameters across the projected population into future years. What represents reasonable is ultimately a subjective judgement. Where possible we have attempted to validate with other external reference points. Changes in profile may also impact on the predictive strength of the characteristic over time. For example, obtaining a university degree may not be as powerful an influence on lifetime earnings and employment as it was for earlier generations, due to a greater proportion of the population obtaining a degree and the changing composition of the economy.

Similarly, the class and payment utilisation variables which are used to project future welfare utilisation are themselves dynamic and the lifetime cost is sensitive to variations in these assumptions and there is uncertainty as to how well the adopted assumptions reflect the likely future experience of the population under the current policy settings.

By its nature the lifetime cost assessment for the rest of the Australian population group may be even more uncertain than the lifetime cost for people currently and recently in receipt of Commonwealth payments. This comprises those segments of the population who have either never been in receipt of Commonwealth payments or who have not been in the last three years. As a result, less is known about the current situation and characteristics of people in these segments. Furthermore their projected future consumption of welfare is generally further into the future than for current and recent welfare recipients. The further out into the future the costs are projected, the more uncertain they become for the range of reasons discussed above.

We have illustrated the sensitivity to the key valuation model assumptions in the section below.

Sensitivity

The lifetime cost results are sensitive to the underlying assumptions. To illustrate these sensitivities we have tested a range of alternate assumptions and the results are presented below.

Table 25: Sensitivity of current liabilities to changes in assumptions

Assumption set	Sensitivity test	Change in lifetime cost, non-Age Pension component	Change in lifetime cost, Age Pension component	Total change in lifetime cost (\$)	Total change in lifetime cost (%)
Mortality	Removal of mortality adjustments for specific population groups	+\$50bn	+\$43bn	+\$93bn	+2.1%
Mortality	Increase future mortality improvements by 25%	+\$17bn	+\$96bn	+\$113bn	+2.5%
Mortality	Remove future mortality improvements	-\$92bn	-\$504bn	-\$596bn	-13.2%
Economic	Discount rate increases 1% to +7%	-\$336bn	-\$673bn	-\$1,008bn	-22.3%
Economic	Discount rate reduces 1% to +5%	+\$462bn	+\$1,095bn	+\$1,557bn	+34.5%
Economic	Long term CPI assumption increases by 1% (from 2.5% to 3.5%, starting from 2023/24)	+\$156bn	-	+\$156bn	+3.5%
Economic	Long term CPI assumption reduces by 1% (from 2.5% to 1.5%, starting from 2023/24)	-\$120bn	-	-\$120bn	-2.6%
Economic	Long term MTAWA assumption increases by 1% (from 4% to 5%, starting from 2023/24)	+\$155bn	+\$884bn	+\$1,039bn	+23.0%
Economic	Long term MTAWA assumption reduces by 1% (from 4% to 3%, starting from 2023/24)	-\$114bn	-\$571bn	-\$685bn	-15.2%
Aged pension	Adjustment to reflect an expected increase in future numbers of part pensioners is removed	+\$2bn	+\$35bn	+\$37bn	+0.8%
Entry and exit rates	Rates of movement from the rest of the population to the active classes increase by 10% for ages up to retirement age	+\$79bn	+\$17bn	+\$96bn	+2.1%
Entry and exit rates	Rates of movement from the rest of the population to the active classes increase by 10% for retirement age and above	+\$8bn	+\$65bn	+\$73bn	+1.6%
Entry and exit rates	Rates of movement from the active classes to the rest of the population increase by 10%	-\$42bn	-\$11bn	-\$53bn	-1.2%
Simulation run	Largest deviation from the presented results over 10 full simulation runs, using different sets of random numbers for each run (see below)	\$1bn	\$1bn	\$2bn	+0.04%

Age pension sensitivities

In section 5.8 we noted that the age pension costs may vary in future as a result of the expected future trend of an increased number of part pensioners over time as people reach retirement with more superannuation assets.

We have allowed for this trend in the valuation results through making an explicit adjustment to increase the proportion of part pensioners entering the Age Pension class in future years. To illustrate the sensitivity to this assumption we have assessed the change in lifetime costs that would occur if we had not made the adjustment. Removing the adjustment would increase the liabilities by 0.8% (applying this adjustment has reduced the lifetime cost by 0.8%).

Simulation run differences

The valuation is based on a simulation method which simulates a possible future scenario for each individual. The model uses random numbers in order to determine the details of the simulation for each individual.

The overall and class level results presented in this report are based on a simulation run of one simulation per person. We considered this number of simulations sufficient owing to the substantial numbers of people within each of these population groups. Where results are presented for smaller groups of people, such as for the groups of interest, the model has been run with a minimum of 100,000 simulations in total (for instance, this is equivalent to 100 simulations per person for a group of 1,000 people or lower numbers for larger groups).

If the model is re-run using an alternative set of random numbers then the simulated future scenario for each individual will change. However as the results are based on a large number of individuals and therefore a large number of simulations, we would expect that the overall results and class level results would only change by a small proportion. Hence, simulation run differences are expected to be a much less significant source of uncertainty in the overall results than the uncertainty associated with the model assumptions (as illustrated in the sensitivities table).

In order to test this we have run the model ten times using different sets of random numbers. When the total lifetime cost was compared across these ten runs, the largest deviation from the presented results was \$2bn, or 0.04% of total lifetime cost. This comparison was also carried out at a class level and the largest deviation in average lifetime cost from the presented results was less than \$1k for each class.



8 Results for income support recipients

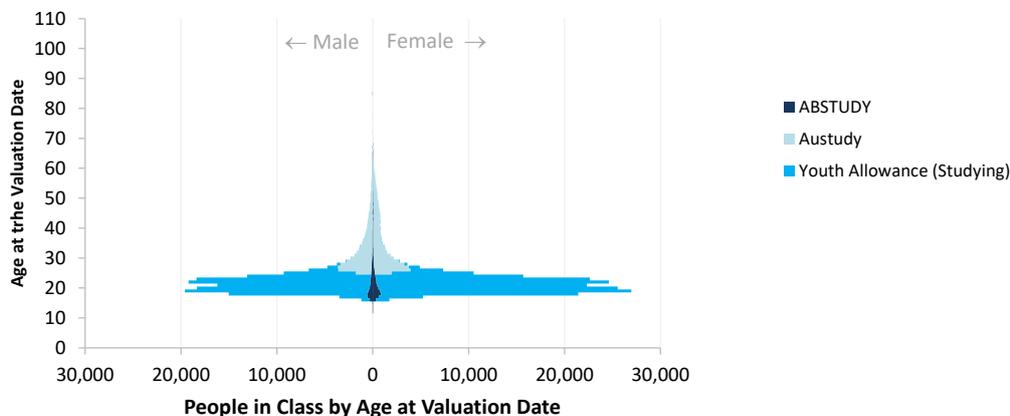
In this section, for each welfare class, we present information regarding the profile of the people in that class and a breakdown of the payments received during 2015/16. We then discuss the key considerations for the setting of the main class movement and payment type assumptions that influence the future outcomes for the class. Finally, we present results based on the application of the assumptions to the people currently in the class using the valuation model.

8.1 Studying Payment recipients

What does the data tell us about people receiving Studying payments?

There were 390,207 people (4.8% of current welfare recipients) in the Studying class in the 2016 model population. The following chart shows a breakdown of the number of people in the Studying class by age, gender and payment type.

Figure 26: 2016 profile of people in Class 1 – Studying (age/gender/payment type)



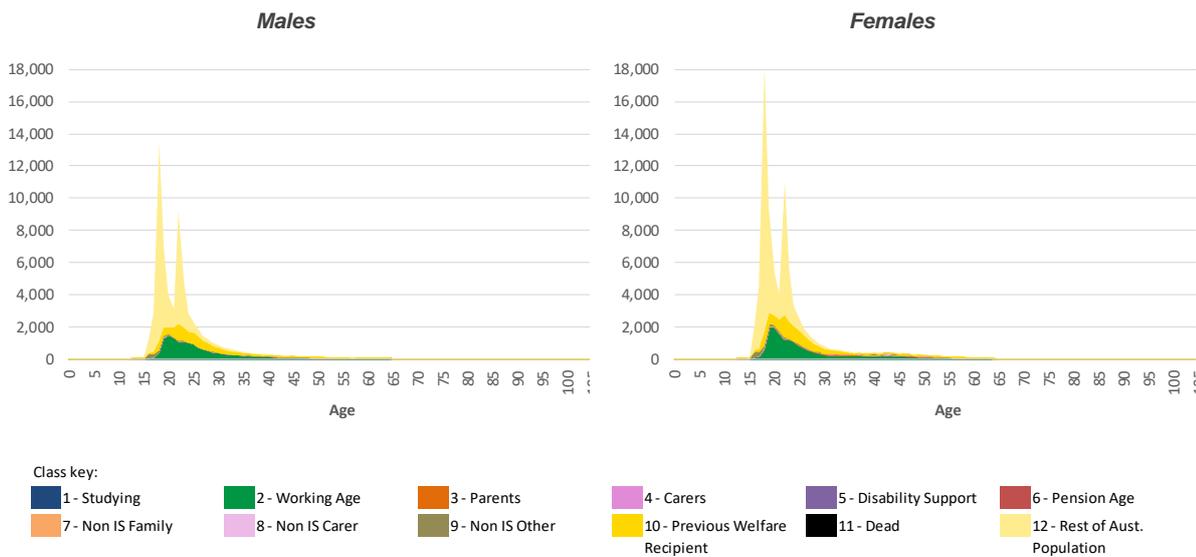
From the chart, we can see that there are a mix of both men and women, albeit with more women at younger ages. The people in the class are mostly in the age range 15 to 30, although there are some people receiving these payments at most ages through to retirement age.

The vast majority of people in the Studying class are on Youth Allowance (if aged up to 24) or Austudy (if over 24 years old). There are a small number of Indigenous people on ABSTUDY across all ages.

Movements into this class

Over the last 3 years, an average of 144,300 people (around 37% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this group by age, gender and previous class.

Figure 27: Number of people entering Class 1 – Studying (annual average over last 3 years)

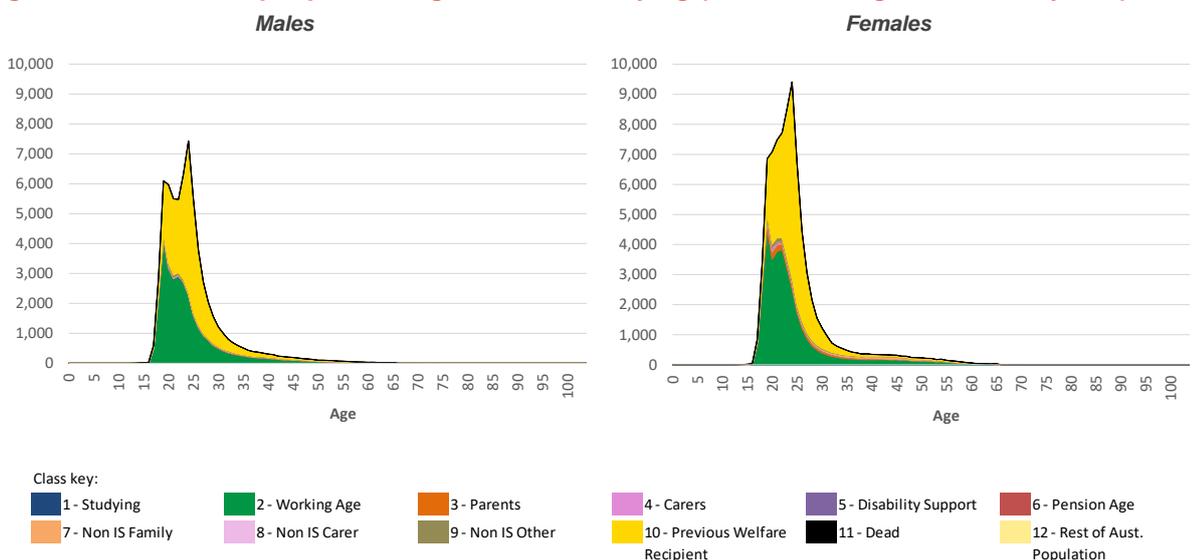


We can see that most people enter this class directly from outside the welfare system, many of whom have never received welfare payments before. This is not unexpected, given the age profile and nature of benefits in this class. Of the people who enter this class from within the welfare system, most people come from the Working Age class.

Movements out of this class

Over the last 3 years, an average of 145,500 people (37%) per annum have transitioned out of the Studying class. The following charts show the breakdown of this group by age, gender and destination class.

Figure 28: Number of people leaving Class 1 – Studying (annual average over last 3 years)

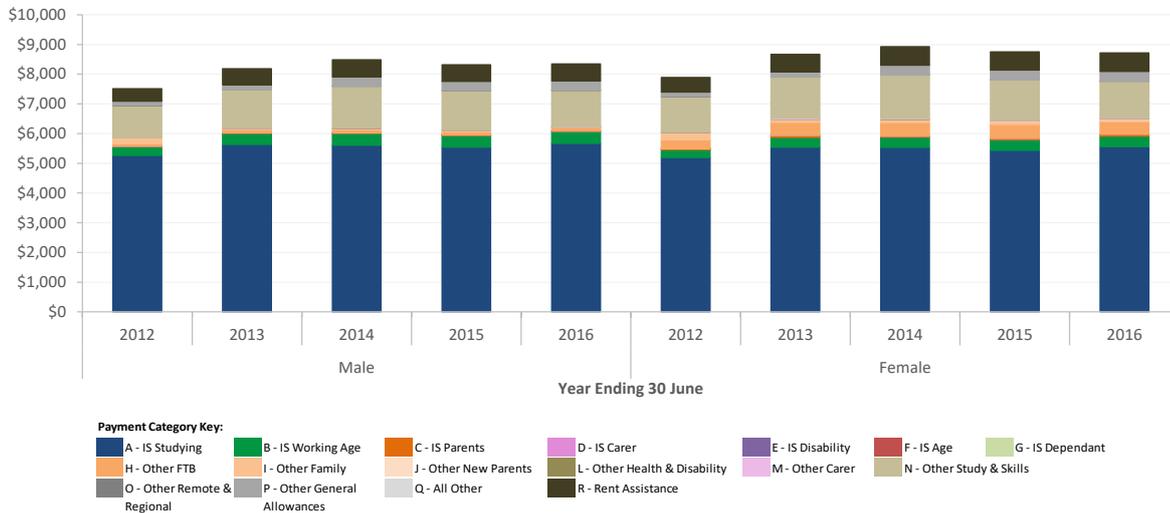


We can see that people in this class show a high level of mobility; not only are 37% of the people in the class today new to the class in the last year, but a significant proportion of the people in this class transition out of the welfare system each year. Notwithstanding these dynamics, there are material proportions of people who transition to the Working Age payment class on leaving the Studying class.

Payments received

During 2015/16, people in this class received a total of \$3.3 billion. This is 3.0% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 29: Average payments per person in Class 1 – Studying (restated to 2015/16 \$ values)



During 2015/16, the average payment made was \$8,600 with slightly higher average payments being made to women as a result of them being more likely to also be claiming FTB and other family payments alongside the main study payment and study supplements.

What have we taken into account in fitting assumptions?

We have adopted class movement, utilisation and payment assumptions through consideration of the risk factors that influence the experience. At this valuation, we have also incorporated several new class characteristic variables, namely the payment type received and an indicator for whether the person has had any earnings from employment.

Class movement assumptions

Movements in and out of Studying have been fairly stable in recent years. Upon leaving the Studying class most people tend to move to either working age payments or exit the system.

In determining class movement assumptions we have considered a number of characteristics, including information about people’s family composition, educational attainment, duration in the class, and detail of other payment types and supplements received. The education level, age of recipient and additional supplements received over the year contain the most significant information in explaining class movements.

Both men and women appear to have a lower probability of remaining in class at ages 25 and up. Upon leaving the class the relative risk of moving to working age payments increases with age while the likelihood of exiting the system is greatest around age 25.

People with higher education level are more likely to leave the Studying class, although they may not necessarily leave the welfare system immediately. Many people with a higher education level transition to working age payments, although subsequent to that they are more likely to exit the welfare system than those with a lower education level (discussed further in section 0).

People receiving other general allowances in addition to the main studying payments tend to be more likely to continue studying. Those who leave quicker than average are more likely to transition onto working age payments, while those who stay in the Studying class longer are more likely to exit the system. People who do not have employment earnings are also more likely to remain on income support and transition to working age payments. Unsurprisingly we can also see that parents are more

likely to move into the parenting or family non IS classes rather than exit and people who partner during the year are more likely to exit or move into one of the non-income support classes.

Payment utilisation and size assumptions

For the Studying class, many people utilise the ‘Other study and skills’ payment category alongside their primary income support payment as well as rent assistance. These payments are the main drivers of the cost. The utilisation model for ‘Other study and skills’ takes into account age, previous utilisation, level of education attained and the number of years in the class. FTB also contributes to the total cost for this class for the small proportion that utilise it.

For the main studying payment the average size increases slightly with age, possibly as a direct result of the higher payment levels for older people (e.g. Austudy rates are higher than Youth Allowance) and for people with children.

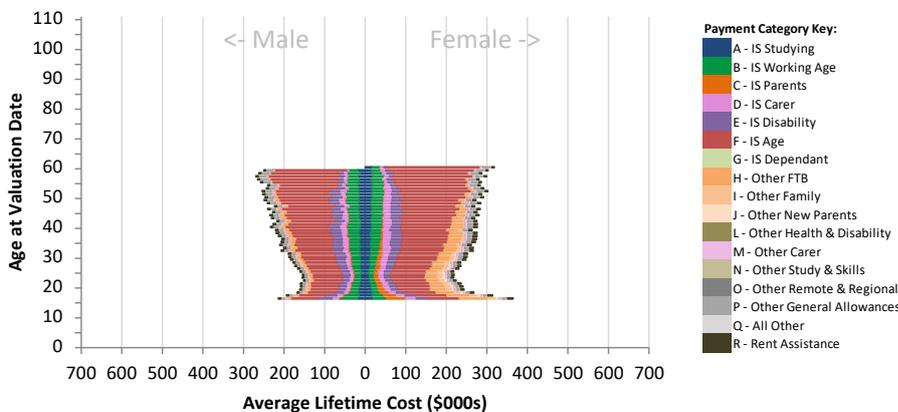
The studying payments model differentiates the size of payments made to different people in the class by considering factors including their age and gender, earnings indicator, partner status, education level, whether they changed class during the year and the person’s duration in the class and in the whole welfare system. Some of these factors simply reflect the person’s likelihood of receiving payments for the full year rather than part of it, and the most likely underlying payment type applicable. Factors such as partner status and earnings directly impact the payment rate applicable.

What does the model show for people in the Studying class?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$82bn** (or **1.8%** of the total lifetime cost). The average lifetime cost for people in this class is **\$210,000**. The variation by age and gender illustrated in the figure below.

Figure 30: Average lifetime cost by age and gender (Class 1)



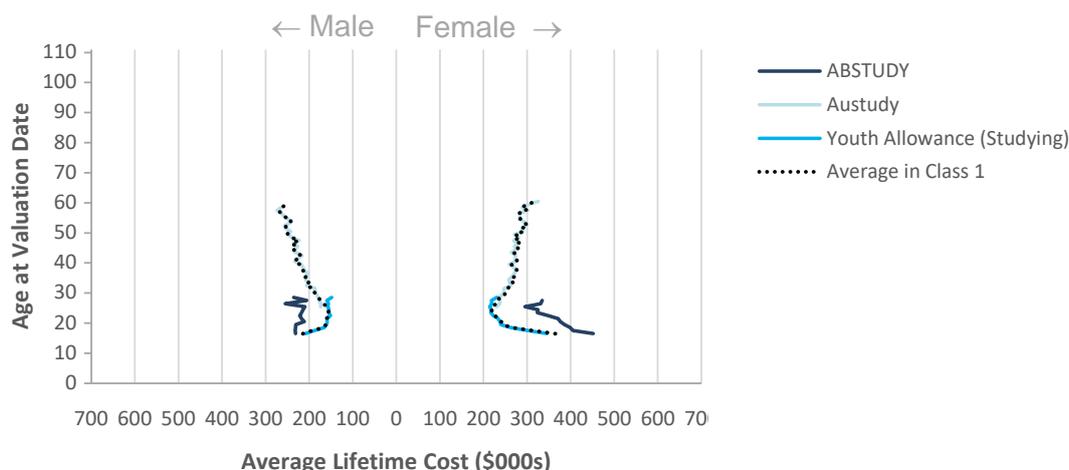
This is the lowest average lifetime cost of the pre-retirement income support classes, despite the people in this class generally being younger and thus having a longer future lifetime.

We can see that the most substantial part of this cost is for the age pension. This component of the average lifetime cost is lower for younger people as their time of retirement is further away and because younger people are more likely to exit and may later draw a lower level of age pension.

The next most apparent feature is the difference between the average lifetime costs for men and women. Women have higher costs through most of the age range as they are more likely to receive FTB or other family payments. For both men and women there are additional cost components for all the main income support payment types reflecting the probability of people moving from the current Studying class onto these payments. There are some differences between the genders, in particular reflecting the differential chances of moving onto parenting payments versus working age payments.

The chart below compares the average future lifetime cost for the groups of people in the class receiving different payment types.

Figure 31: Average lifetime cost by age, gender and payment type (Class 1)



Note: Lines are only shown for ages where there are sufficient numbers of people. The black dotted line is the average across all payment types, and corresponds to the average lifetime cost (total of all payment categories) shown in Figure 30 above.

From the chart, we can see that those receiving Abstudy payments have noticeably higher average lifetime costs than the other people in this class. This reflects that this group of Indigenous people are more likely to stay within the welfare system in the future.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$82bn is a reduction of \$15bn compared to the baseline valuation. This was primarily driven by a reduction in the average cost (as opposed to a change in population in this class):

- The number of people in this class has remained relatively similar to the previous valuation due to expected growth being offset by higher exits than expected.
- The average cost has reduced by \$37,000 (15.1%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by grouped payment category.

Table 26: Breakdown of change in average lifetime cost for Class 1 by payment category

	Total	IS			Non IS	
		Studying	Other (excl. Age Pension)	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$97bn					
Jun-16 Total Lifetime Cost	\$82bn					
Change in Total Lifetime Cost	-\$15bn (15.4%)					
Change due to Population	-0.3%					
Change due to Average Lifetime Cost	-\$37k (15.1%)	-\$1k	-\$23k	-\$1k	-\$5k	-\$6k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	-\$14k	< \$1k	-\$9k	-\$2k	< \$1k	-\$2k
- Impact of policy changes	-\$3k	< \$1k	< \$1k	< \$1k	-\$2k	-\$1k
- Impact of other changes	-\$21k	< \$1k	-\$14k	< \$1k	-\$3k	-\$4k

Note that payment categories H, I and J have been included in family supplements and the remaining non income support payment categories in other supplements.

The reduction in average lifetime cost has been primarily driven by:

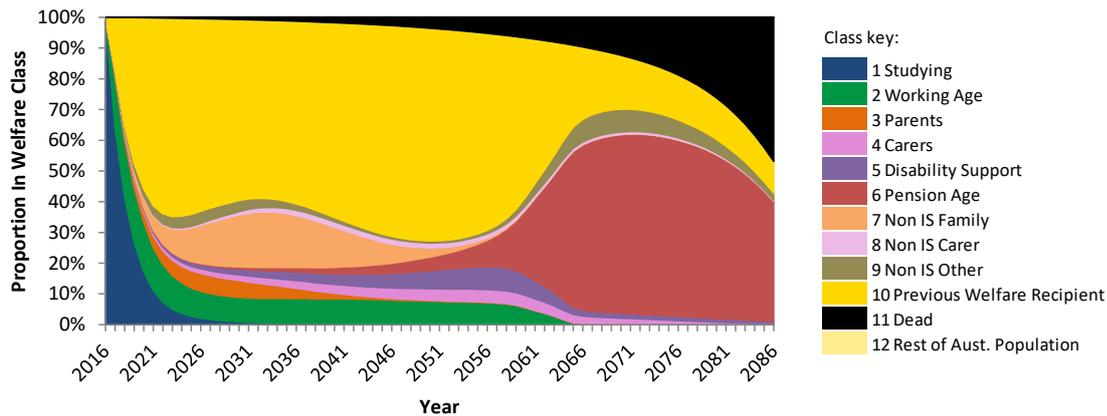
- Lower transition rates into working age as a result of both:
 - Reductions to the adopted re-entry rates into working age; and
 - The reduction in the assumed long term unemployment rate;

- A reduction in transitions into the disability support pension, which impact the Studying class as they have a reduced likelihood of moving into this class later in life.
- A smaller part of the decrease is from reductions to future supplements, this is mostly a flow on effect from the reductions in future income support utilisation, however a small part of this (approximately \$3k) reflects the changes to FTB and student supplements.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 32: Expected future trajectory for people in Class 1



Some observations we can make based on our analysis are that:

- Most people (around 90%) exit the class over the next 5 years however only around half of those present today are expected to leave the payment system completely over this timeframe. Of the rest:
 - many move onto working age payments and some onto parenting payments
 - small proportions move onto Carer payment and Disability Support Pension
- Of the group who exit over the next 5 years, a proportion later return primarily to class '7 Non IS Family' over the following 10 years, presumably as they have their families and receive FTB and family payments
- A small proportion (around 2%) of people currently in this class will still be in this class in 10 years' time (either by remaining in this class throughout this time, or by exiting and returning). It may be worth exploring which types of people remain on these payments for extended periods
- Around 20% or more of the original group receive some form of income support payment in each projected year over the average lifetime of the group
- After 30 years, just over 20% of the original class are projected to be on some form of income support payment. This proportion increases beyond that point in time as more people progress to the age pension.

Duration

The average future life expectancy for people in the Studying class is **67** years. This reflects the relatively young age profile of people in this class.

The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 27: Expected durations in welfare system for people currently in Class 1

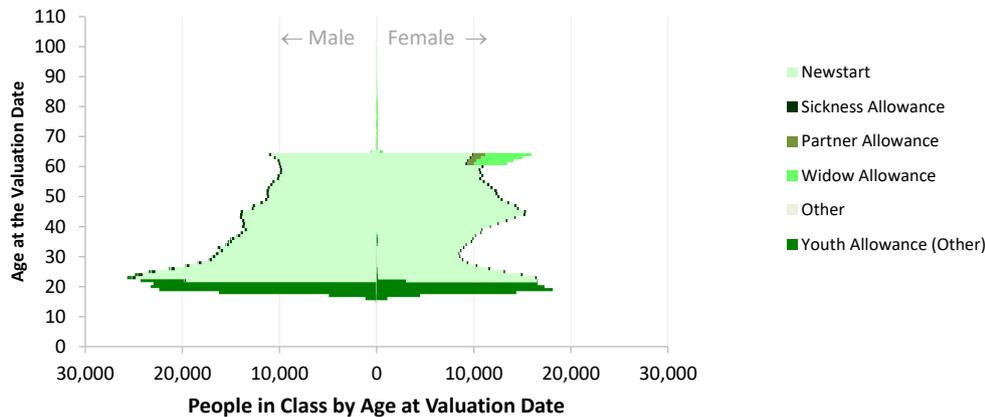
	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	11	16%
- Aged pension (class 6)	17	25%
Years with non-income support payments only	7	10%
Years not receiving any welfare payments	32	49%
Total	67	100%

8.2 Working Age Payment recipients

What does the data tell us about Working Age people?

There were 1,317,538 people (16.4% of current welfare recipients) in the Working Age class in the 2016 model population. The following chart shows a breakdown of the number of people in the Working Age class by age, gender and payment type.

Figure 33: 2016 profile of people in Class 2 – Working Age (age/gender/payment type)



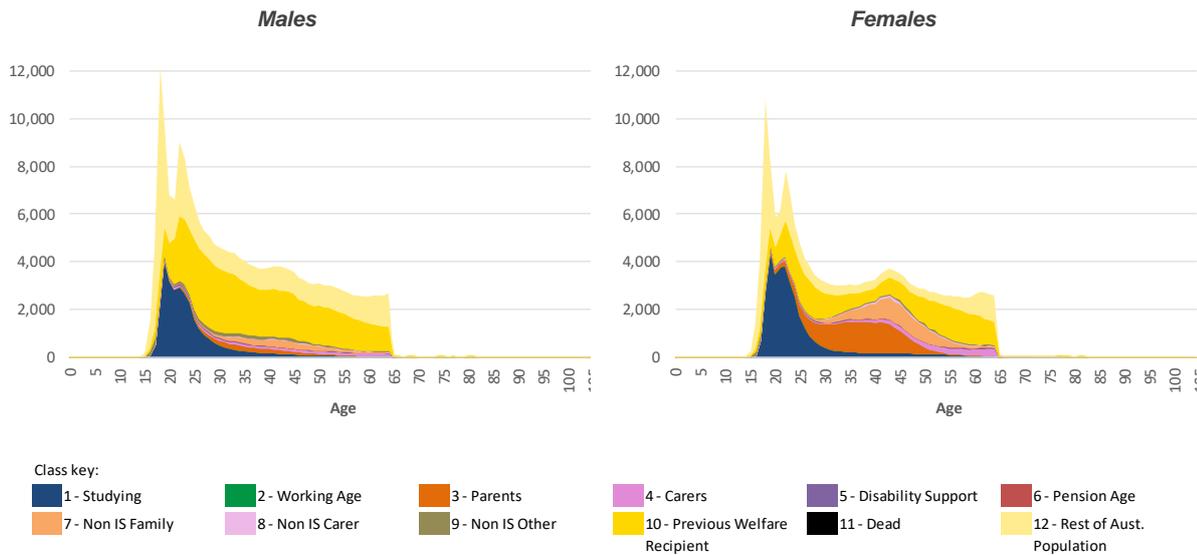
From the chart, we can see that there are a mix of both men and women, albeit with more men than women at younger ages which may be because more women are receiving Parenting or Studying payments. The numbers in the class peak for people in their twenties and then gradually reduce up to pension age. This pattern is particularly evident for men; for women the shape is different as many women transition to receiving parenting payments.

The vast majority of people in the Working Age class are on Youth Allowance (if aged up to 21) or Newstart Allowance (if over 21 years old). The remaining people are mostly on Sickiness Allowance; there are also a small number of people (mostly women) at the older ages still accessing Partner Allowance and Widow Allowance although these will decrease over time as these benefits are gradually phased out.

Movements into this class

Over the last 3 years, an average of 391,200 people (around 30% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this by age, gender and previous class.

Figure 34: Number of people entering Class 2 – Working Age (annual average over last 3 years)

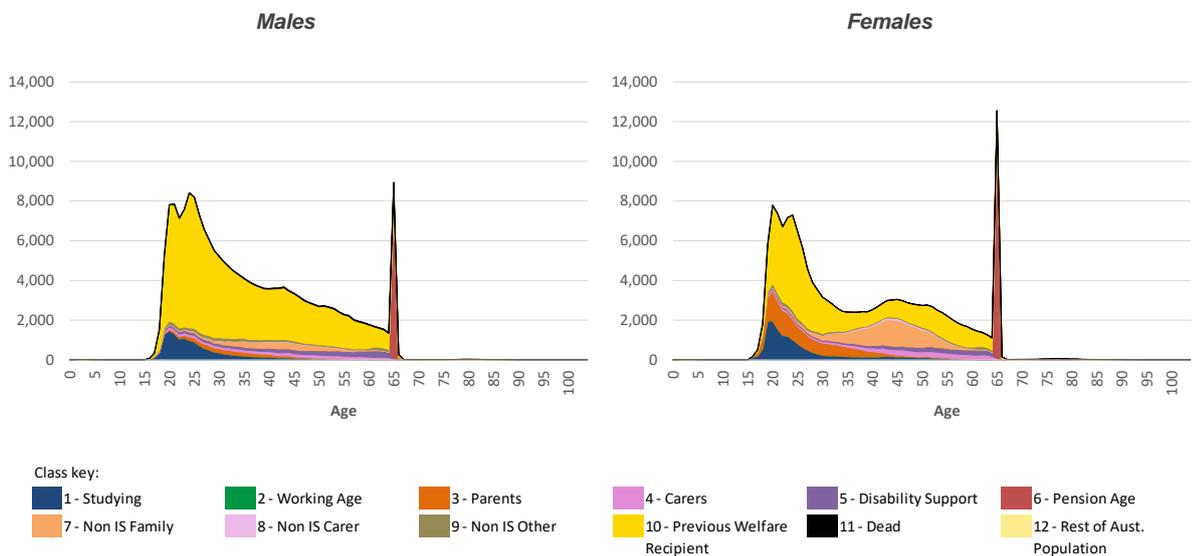


We can see that people in this class primarily came from outside the welfare system, many of whom had previously accessed welfare payments. Of the people who entered this class from within the welfare system, most people at the younger ages came from Studying, while women aged 25 or above generally come from Parents or Non IS Family.

Movements out of this class

Over the last 3 years, an average of 364,000 people (28%) per annum have transitioned out of the Working Age class. The following charts show the breakdown of this by age, gender and destination class.

Figure 35: Number of people leaving Class 2 – Working Age (annual average over last 3 years)

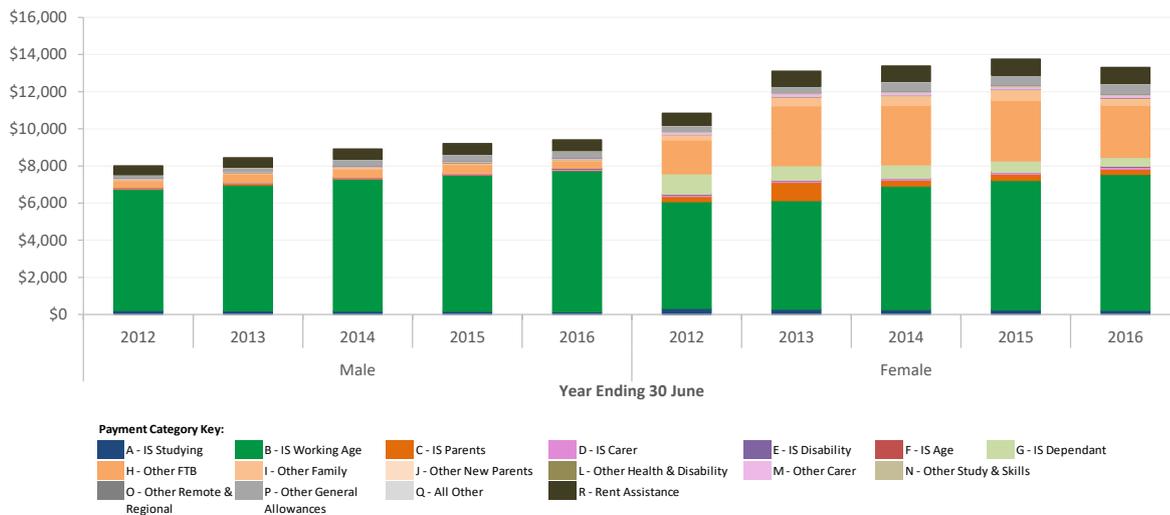


We can see that people in this class show some mobility, with a mixture of exits from the system and movements to a range of other classes. Most people who leave this class but remain in the system tend to transition to class '1 Studying' (at the younger ages), class '6 Pension Age' (at retirement) and, for women, classes '3 Parenting' and '7 Non IS Family'.

Payments received

During 2015/16, people in this class received a total of \$14.8 billion. This is 13.2% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 36: Average payments per person in Class 2 – Working Age (restated to 2015/16 \$ values)



During 2015/16, the average payment made was \$11,200 with considerably higher average payments being made to women (\$13,300) than men (\$9,400). As can be seen from the chart above, this is because of their greater propensity to receive FTB and family payments alongside the main working age payment.

The Working Age class also contains a small group of dependants, being people receiving either Partner Allowance or Widow Allowance. The eligibility criteria for these payments are such that this group are all age 60 or above at the valuation date and almost all women. The contribution of the payments made to this group can be seen in the female section of the chart above.

What have we taken into account in fitting assumptions?

We have adopted class movement, utilisation and payment assumptions through consideration of the risk factors that influence the experience. At this valuation, we have also incorporated several new class characteristic variables, namely the payment type received and an indicator for whether the person has had any earnings from employment.

Class movement assumptions

In setting the class movement assumptions we have observed a slight but steady increase in the proportion of individuals remaining in this class year on year from 2012 onwards. This may partially be a flow-on effect of policy changes that reduce the ease of transitioning to other classes, such as to the Parenting class, or to the Disability Support Pension class.

For the assumptions for movements out of this class, we have considered combination of factors, both those relating to the recipient (e.g. age, gender, education level, partnering status, employment earnings indicator, number of dependent children, and age of youngest child) and those relating to how the recipient interacts with the system (e.g. payment type, how long they've been in the class, previous payment class, and detail of other payment types and supplements previously received).

Whether a person has employment earnings or not is the most significant predictor of remaining in class and therefore of a higher average lifetime cost. Recipients who are receiving some employment income are more likely to either transition out of the system or to a non-income support class rather than remain on income support. The payment type variable was also predictive, with people receiving Sickness Allowance having a higher likelihood of exiting working age payments; these people appeared to fall into one of two categories – those whose illness is temporary and are more likely to move off income support, and those with a longer term illness or disability who move into disability support.

Other factors which have a significant impact on a person's trajectory are: the highest level of education attained, their previous payment class, the length of time spent receiving working age payments, and the number of dependent children. Those who have attained a higher level of education in either a bachelor's degree or higher are relatively more likely to exit the system than those with a lower level of education attained, whereas recipients who transitioned to the Working Age class from within the

welfare system are less likely to exit the system. This may be an indication that some recipients are at risk of becoming entrenched and remaining dependent on welfare payments in the longer term.

Payment utilisation and size assumptions

In terms of the payment utilisation assumptions, many people receive FTB and family payments and some receive other study and skills payments, all alongside their main income support and other living and pension supplements. The working age payment, FTB and rent assistance make up most of the overall cost. We have therefore focused on developing risk based models for these payment categories, and have adopted foundation assumptions based on age and gender only for some of the smaller payment categories. We have also developed risk based models for the utilisation of Other Family and Other New Parents.

In addition to age and gender of recipient, the FTB and family payment models take into account partner status, number of children, age of youngest child, earnings indicator, previous welfare class and utilisation. The utilisation model for rent assistance includes factors such as number and age of children, Indigenous status, partner status, education level and earnings indicator. Some of these factors are a reflection of financial hardship and therefore the likelihood of requiring rent assistance.

For the payment models we have fit risk models for the main working age income support and FTB payment categories. The working age income support model recognises information which impacts people’s payment levels and the number of weeks on payment during the year, including partner status and the duration in class. For the main working age payment, the average annual payment increases slightly with age, which may simply be a reflection of older people being more likely to be in the class for the full year. We have observed a continued increase in the main working age payment average size over time. This is likely caused by longer durations on benefit, and may also be related to having a higher number of older people in the class owing to the increase in female retirement age and tightening of the DSP eligibility criteria. Our average payment assumptions have been based on the average of the experience over the last 2 years, giving credibility to the more recent higher experience.

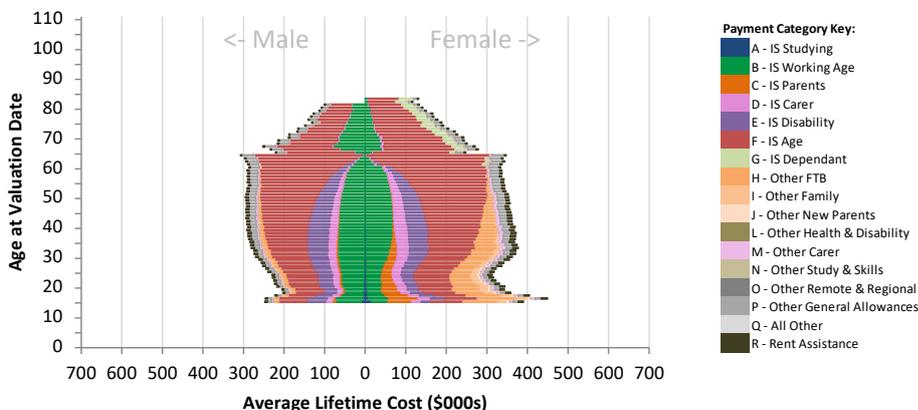
The FTB payment model takes into account factors such as previous welfare utilisation, years in class, age of youngest child, number of children and partner status. The average size for FTB payments increases with age, peaking in the late thirties and reducing thereafter. This is likely a reflection of the change in the age of their dependent children as welfare recipients get older.

What does the model show for the current Working Age group?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$401bn** (or **8.9%** of the total lifetime cost). The average lifetime cost for people in this class is **\$304,000**. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 37: Average lifetime cost by age and gender (Class 2)



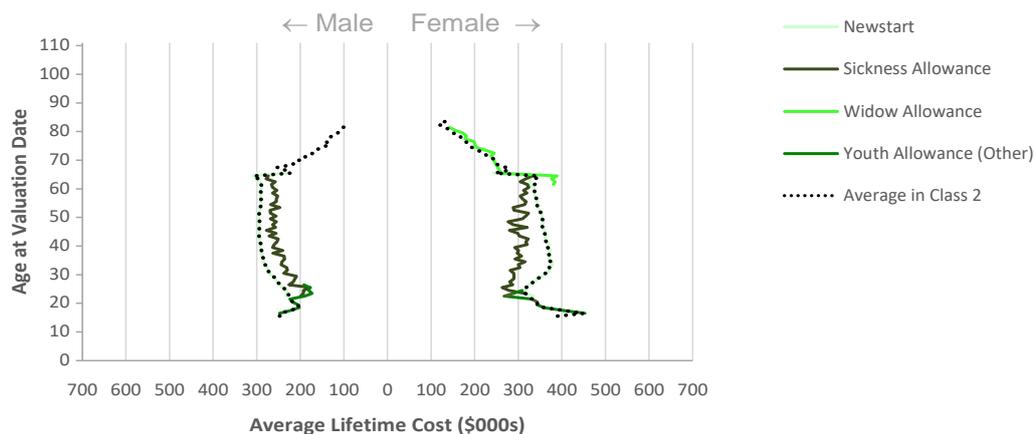
The vast majority of people in this class are in the age range 15 to 65. The other people in this class are generally receiving some of the smaller payment types such as special benefit and sickness allowance.

The largest part of the lifetime cost is from the age pension (note that we expect to see this across most of the classes). As a proportion of the total lifetime cost, the age pension component increases with age up to age 65, as most people under retirement age are expected to enter the age pension on retirement.

The other main components of the lifetime cost are for working age payments, disability support pension, and carer payments. Parenting, FTB and family payments are also significant for women up to around age 50.

The chart below compares the average future lifetime cost for the groups of people in the class receiving different payment types.

Figure 38: Average lifetime cost by age, gender and payment type (Class 2)



Notes:

Lines are only shown for ages and payment types where there are sufficient numbers of people. The black dotted line is the average across all payment types, and corresponds to the average lifetime cost (total of all payment categories) shown in Figure 37 above.

As most people in this class are receiving Newstart payments, the Newstart line is very close to the Class 2 average.

From the chart, we can see that people on Sickness Allowance have a significantly lower cost than the overall average in this class (which is predominantly people on Newstart), possibly reflecting the temporary nature of this payment type. People remaining on Youth Allowance above age 21 also tend to have a lower average cost compared to those who have transitioned onto Newstart.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$401bn is a reduction of \$10bn compared to the baseline valuation. This was primarily driven by a reduction in the average cost (as opposed to a change in population in this class):

- The number of people in this class has increased slightly since the previous valuation, with expected growth being offset by lower entries than expected (particularly from previous welfare recipients).
- The average cost has reduced by \$11,000 (3.5%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by grouped payment category.

Table 28: Breakdown of change in average lifetime cost for Class 2 by payment category

	Total	IS			Non IS	
		Working Age	Other (excl. Age Pension)	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$410bn					
Jun-16 Total Lifetime Cost	\$401bn					
Change in Total Lifetime Cost	-\$10bn (2.4%)					
Change due to Population	+1.2%					
Change due to Average Lifetime Cost	-\$11k (3.5%)	-\$5k	-\$3k	+\$2k	-\$3k	-\$2k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	-\$13k	-\$5k	-\$3k	-\$3k	< \$1k	-\$1k
- Impact of policy changes	-\$1k	< \$1k	< \$1k	< \$1k	-\$1k	< \$1k
- Impact of other changes	+\$3k	< \$1k	< \$1k	+\$4k	< \$1k	< \$1k

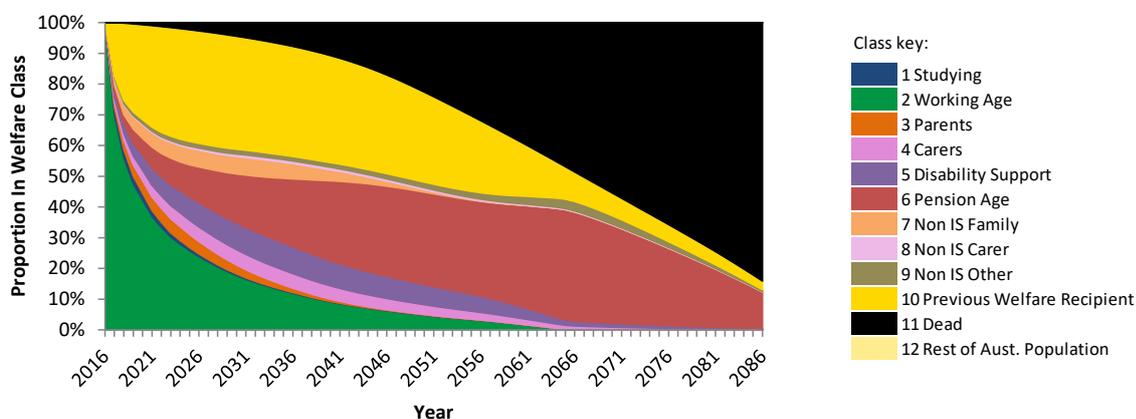
The reduction in average cost has been primarily driven by the reduction in the assumed long term unemployment rate which has resulted in:

- An increase in exits from Working Age as more people are assumed to find employment and hence cease requiring income support;
- A decrease in future re-entries back into the welfare system, in particular re-entries back onto working age payments; and
- A flow on impact onto other income support categories.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 39: Expected future trajectory for people in Class 2



Some observations we can make based on our analysis are that:

- About 40% of the people currently in the Working Age class will stop receiving any income support over the next 5 years. Most of these people will stop receiving any payments; the rest will keep receiving one or more of the family payment categories.
- Over the same timeframe, of the people who stay on income support payments, around 60% remain on the working age payment. The remainder either retire (and move onto the age pension) or move onto parenting, carer or disability payments.
- 37% of the people currently in this class will still be in this class in 5 years' time (either by remaining in this class throughout this time, or by exiting and returning). This figure reduces to 24% by 10 years' time.

Results for income support recipients

- After 35 years, around 45% of the original group are projected to be on some form of income support payment.

Duration

The average future life expectancy for the Working Age class is **49** years. This reflects that the age profile of this class is well distributed across the working ages. The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 29: Expected durations in welfare system for people currently in Class 2

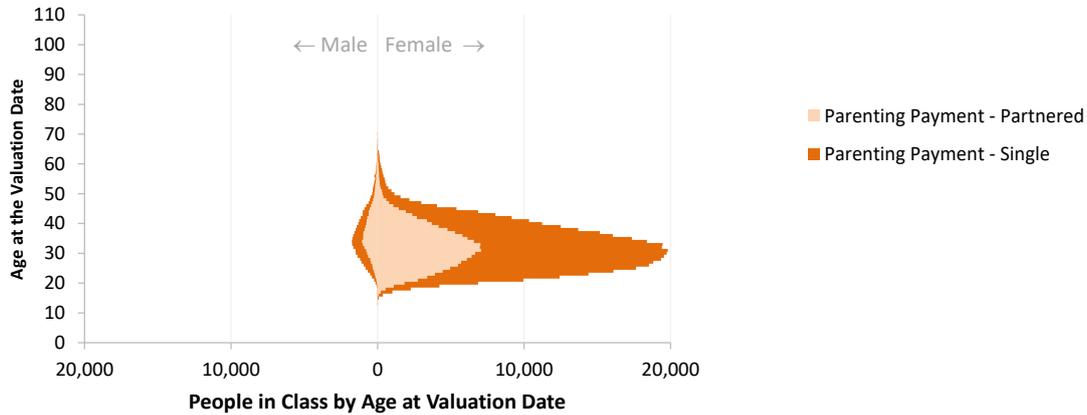
	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	13	27%
- Aged pension (class 6)	17	35%
Years with non-income support payments only	3	6%
Years not receiving any welfare payments	16	32%
Total	49	100%

8.3 Parenting Payment recipients

What does the data tell us about Parenting payment recipients?

There were 436,585 people (5.4% of current welfare recipients) in the Parenting class in the 2016 model population. The following chart shows a breakdown of the number of people in the Working Age class by age, gender and payment type.

Figure 40: 2016 profile of people in Class 3 – Parents (age/gender/payment type)

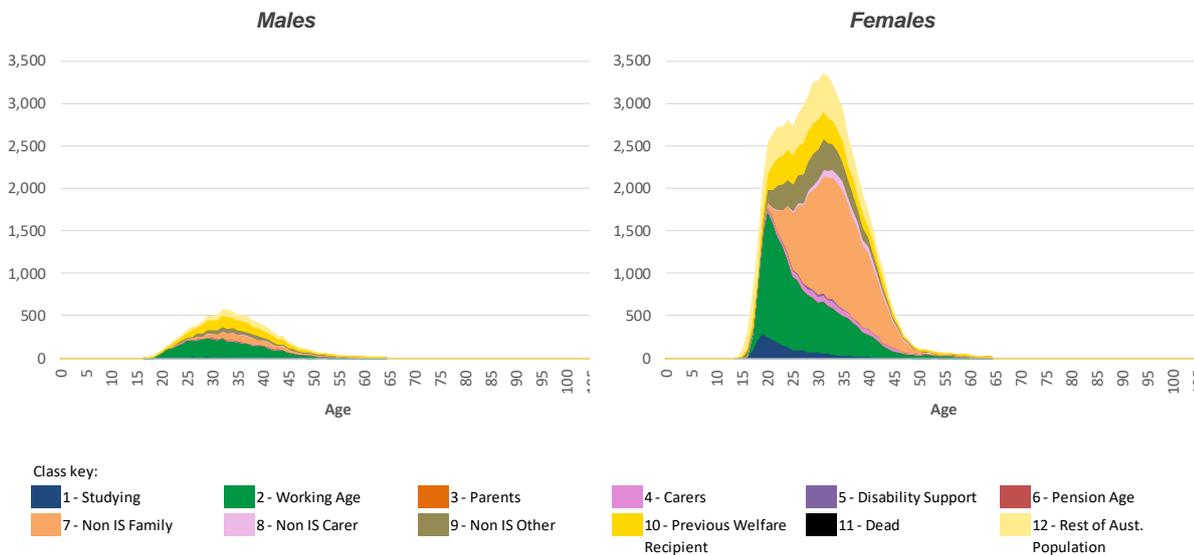


The people in this class are predominantly women and in the age range 15 to 50. The majority (67%) of the people in this class are single.

Movements into this class

Over the last 3 years, an average of 80,900 people (around 19% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this by age, gender and previous class.

Figure 41: Number of people entering Class 3 – Parents (annual average over last 3 years)

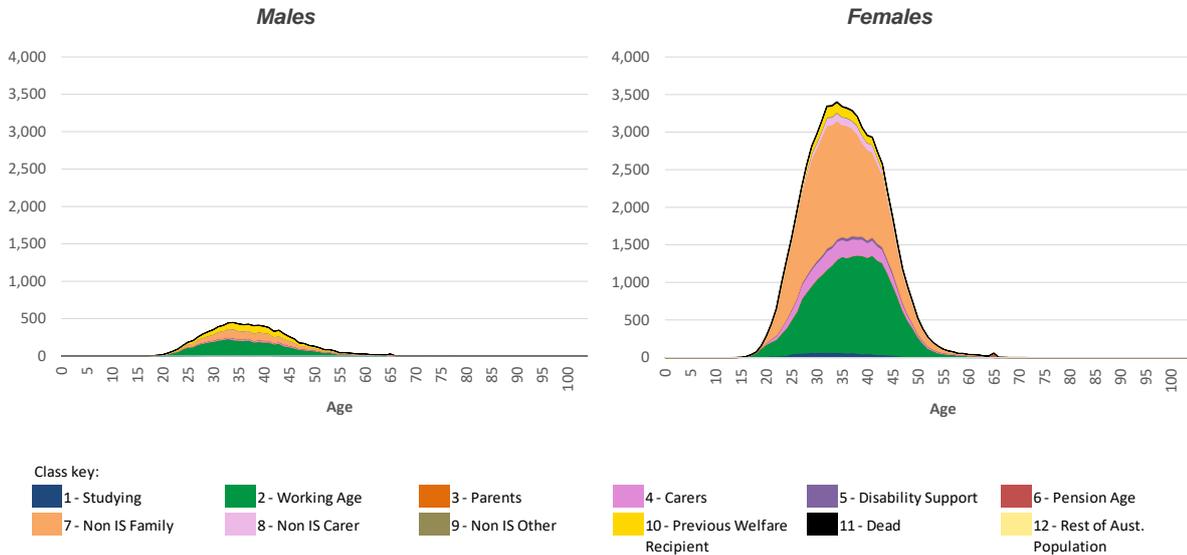


We can see that people in this class primarily came from the Working Age class or, for women, also the Non IS Family class. There are also material numbers coming directly from outside the welfare system and, for women, from Non IS Other (these are presumably people who have just started to receive FTB or other family payments and are similar to those in Non IS Family).

Movements out of this class

Over the last 3 years, an average of 78,800 people (18%) per annum have transitioned out of the class. The following charts show the breakdown of this by age, gender and destination class.

Figure 42: Number of people leaving Class 3 – Parents (annual average over last 3 years)

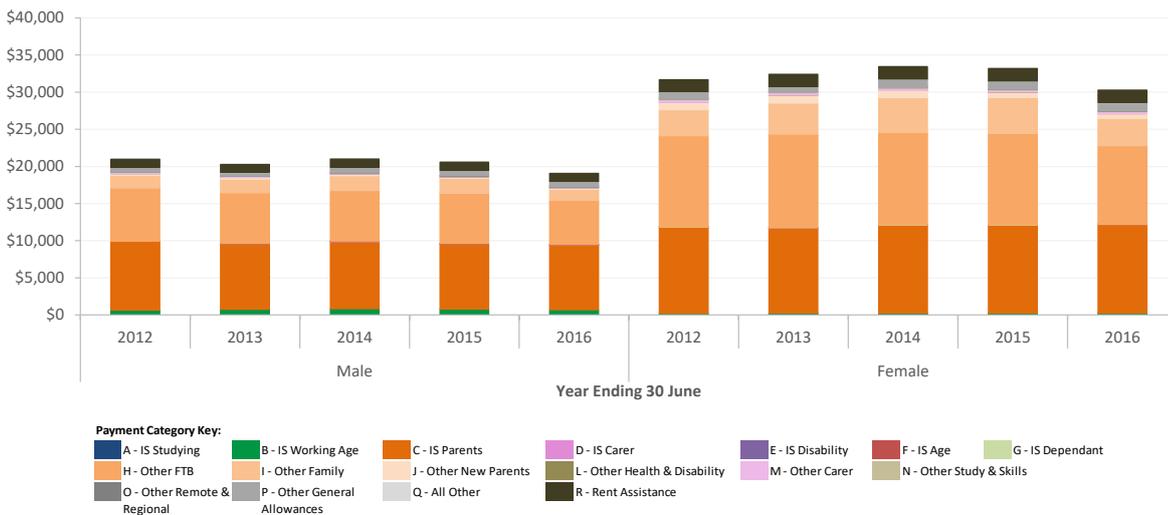


We can see that people in this class show considerable mobility. However note that many people exit to other active classes upon ceasing to meet the eligibility criteria for parenting payment, which is linked to the age of the person’s youngest qualifying child. The most common destinations are the Working Age and Non-IS family classes. Only a small proportion of people exit the system directly from this class.

Payments received

During 2015/16, people in this class received a total of \$12.8 billion. This is 11.5% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 43: Average payments per person in Class 3 – Parents (restated to 2015/16 \$ values)



As shown in the chart above, the average amount per person for 2015/16 is around 9% lower than prior years. This is likely due to the payments in the 2015/16 year being understated, as it will not fully reflect all FTB and family payments which can be received as part of an income tax assessment post 30 June.

People in this class receive some of the highest average annual payments. The average payment made in 2014/15 (noting the potential understating of 2015/16) was \$32,200 with considerably higher average

payments being made to women (\$33,200) than men (\$20,600). The average payment is significantly higher for women than men as a result of them being more likely to receive FTB and family (child care) payments in addition to the main payment. The rate of the parenting payment itself is also higher on average for women as a higher proportion of women are receiving the single rather than the partnered rate.

What have we taken into account in fitting assumptions?

We have adopted class movement, utilisation and payment assumptions through consideration of the risk factors that influence the experience. At this valuation, we have also incorporated several new class characteristic variables, namely the payment type received and an indicator for whether the person has had any earnings from employment.

Class movement assumptions

Parenting payments eligibility has been significantly influenced in the last five years by the removal of grandfathering provisions regarding the age of youngest child. As a result, the rates of men and women staying in the Parenting class was significantly lower around 2012 to 2013. Since then, the transition rates have been relatively stable. As such, we have generally relied on the most recent (and more stable) 3 years of experience when setting assumptions.

The model uses a combination of terms including the age, gender, partnership status, age of youngest child, and detail of other payment types and supplements previously received. The most significant terms are those covering the age of youngest child (specifically for ages between five and eight inclusive), and whether they are receiving parenting payment single or partnered (which is highly correlated with their partnership status).

For the assumptions for movements out of this class, we observed that most people stay in the class from year to year and then leave when their youngest child is between five and eight. This reflects the parenting payment eligibility conditions and also changes in behaviour once the children reach school age.

In terms of other factors, we observed that people are more likely to move to the Working Age class as age increases, while people receiving parenting payment partnered are generally more likely to exit the system than those on the single payment.

Payment utilisation and size assumptions

For the payment utilisation assumptions, the majority of people receive both FTB and family payments and some others receive the new parents' payments, all alongside their main income support, pension supplements and rent assistance. We have developed risk based models for the utilisation of FTB, family, new parents and rent assistance.

In addition to age and gender, the FTB, family and new parents utilisation models include factors such as number and age of children, partner status and previous welfare utilisation. The utilisation model for rent assistance considers number and age of children, Indigenous status, partner status, education level and earnings indicator.

The FTB and family payments make up around half of the overall cost, with the main parenting payment representing around 35% to 40% of the overall cost. For the main parenting payment the average size reduces slightly with age. This may simply be a reflection of older people being more likely to be partnered.

For the payment models we focussed on modelling the payment levels for the main income support payments, FTB and family payments categories. The size model for the main income support payment includes information on number and age of children, payment type, earnings indicator, previous welfare utilisation and duration in current class.

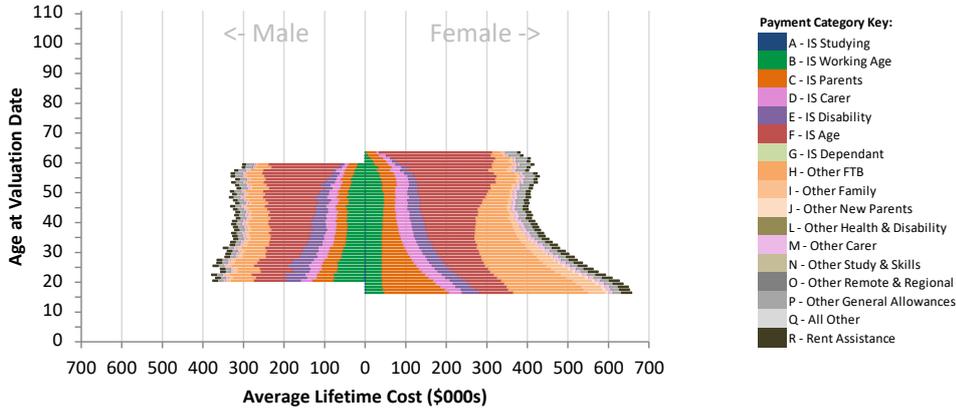
The FTB and family payments size models take into account factors such as age and number of children, education level and earnings. Most of these factors reflect the criteria that determine the most likely underlying payment rate applicable.

What does the model show for current Parenting payment recipients?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$207bn** (or **4.6%** of the total lifetime cost). The average lifetime cost for people in this class is **\$475,000**, a significantly higher amount than for the Studying or Working Age class. The variation by age and gender illustrated in the figure below.

Figure 44: Average lifetime cost by age and gender (Class 3)



There is significant variation by age and gender illustrated in the figure above.

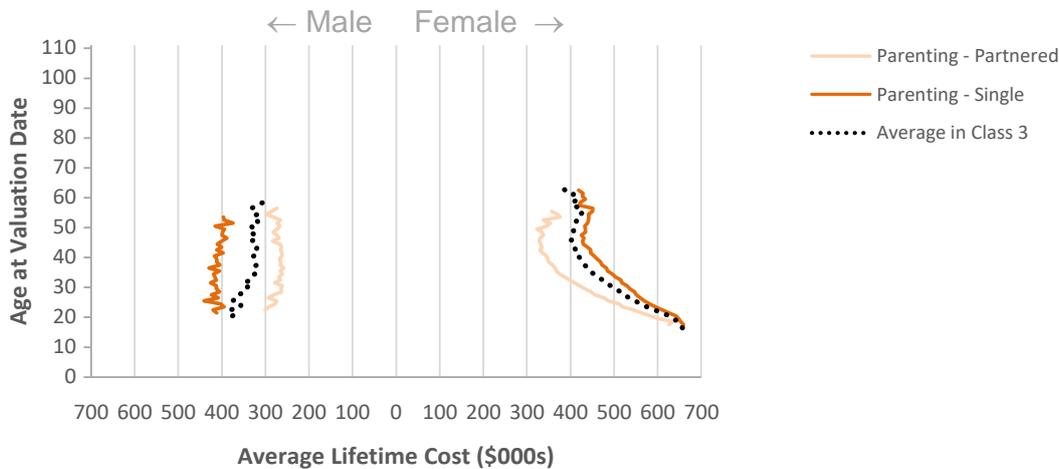
For men the average lifetime cost is much lower than for women (**\$332,000 vs. \$485,000**). This reflects the previous observation, that women typically receive higher annual payments as a result of receiving more FTB and family payments.

The average lifetime costs are higher for the younger people in the class, especially the younger women. This is because they are more likely to stay on the parenting and FTB payments for longer and also may be more likely to transition to other types of income support.

The average lifetime costs also have small but clear contributions from both disability support and carer payments. These reflect the likelihood of people in the Parenting class to move into these classes in future years.

The chart below compares the average future lifetime cost for the groups of people in the class receiving different payment types.

Figure 45: Average lifetime cost by age, gender and payment type (Class 3)



Note: Lines are only shown for ages where there are sufficient numbers of people. The black dotted line is the average across all payment types, and corresponds to the average lifetime cost (total of all payment categories) shown in Figure 44 above.

From the chart, we can see that single people have a higher average lifetime cost than partnered people. This primarily reflects that single people are more likely to use other types of income support (in particular working age and disability support) compared to partnered people. This is further explored in section 14.1.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$207bn is an increase of \$16bn compared to the baseline valuation. This was primarily driven by an increase in the average cost, although an increase in the number of people in this class also contributed:

- The number of people in this class has increased slightly since the previous valuation as a result of slightly lower than expected movements out of the class over the year.
- The average cost has increased by \$33,000 (7.5%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 30: Breakdown of change in average lifetime cost for Class 3 by payment category

	Total	IS			Non IS	
		Parenting	Other (excl. Age Pension)	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$191bn					
Jun-16 Total Lifetime Cost	\$207bn					
Change in Total Lifetime Cost	+\$16bn (8.6%)					
Change due to Population	+1.0%					
Change due to Average Lifetime Cost	+\$33k (7.5%)	+\$10k	+\$6k	+\$3k	+\$13k	+\$2k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	-\$9k	< \$1k	-\$4k	-\$2k	-\$1k	< \$1k
- Impact of policy changes	-\$6k	< \$1k	< \$1k	< \$1k	-\$6k	< \$1k
- Impact of other changes	+\$48k	+\$10k	+\$10k	+\$5k	+\$20k	+\$3k

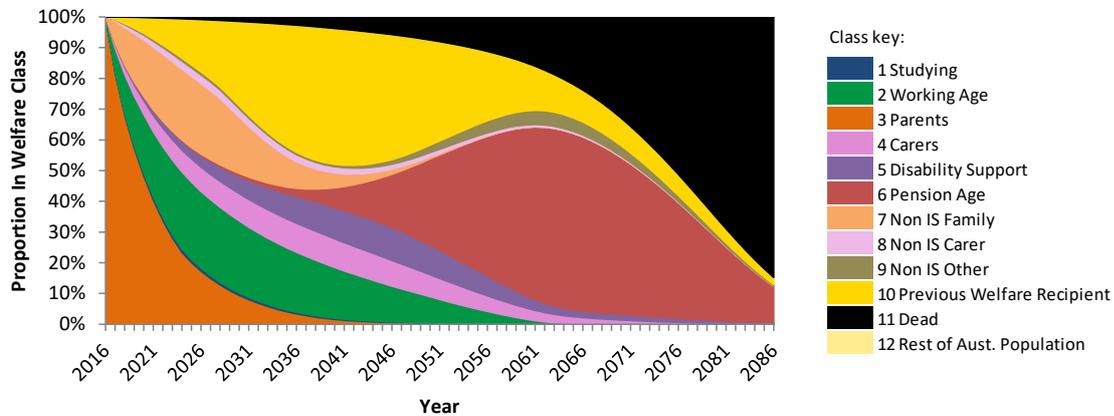
The increase in average cost has been primarily driven by:

- An increase in the assumed probability of people remaining in the Parenting class in response to recent experience, which leads to a longer duration receiving income support and family supplements;
- The impact of enhancing the projection model to include employment earnings – this leads to increased differentiation between population subgroups which are expected to have high persistency and subgroups which are expected to have low persistency. The high persistency subgroups within this class are contributing to this increased averaged lifetime cost, their identification results in a higher expected level of future income support payments both in the Parenting class and once they have transitioned out of the Parenting class.
- A lower long term unemployment rate assumption, which reduces the projected future duration on income support (particularly working age benefits).
- Policy changes to FTB and child care have had a decreasing impact on the average size for family supplements. The more refined modelling of the utilisation of FTB, family and new parents payments has contributed to the increased contribution of family supplements to the lifetime cost. The new models are better able to reflect people's specific family composition.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 46: Expected future trajectory for people in Class 3



We can see the expectations are that:

- There is a steady reduction in numbers of current parenting payment recipients remaining on those payments.
 - Most of the reduction takes place over the next 10 years
 - This is related to the current and future family composition of the people in this class and specifically the link between parenting payment eligibility and the age of a person’s youngest child.
- As people exit this class a significant proportion move first to the Non IS Family class (i.e. they receive only FTB or child care payments).
- 30-40% of people currently in the class will move into another income support class when they exit parenting payment. The most common next income support destination is working age, followed by carer or DSP.
- After 35 years, around 55% of the original group are projected to be on some form of income support payment

Duration

The average future life expectancy for the Parents class is **57** years. This reflects that the age profile of this class is well distributed across the ages 20 to 50.

The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 31: Expected durations in welfare system for people currently in Class 3

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	19	33%
- Aged pension (class 6)	17	31%
Years with non-income support payments only	6	11%
Years not receiving any welfare payments	14	25%
Total	57	100%

8.4 Carers (Income Support)

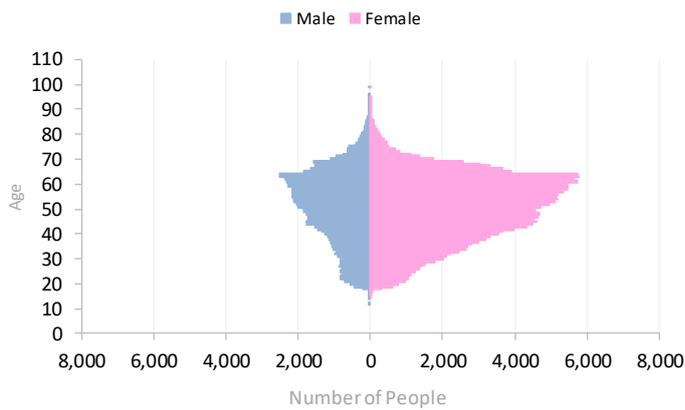
This class includes people receiving the Carer Payment in 2015/16 as their last income support payment. People receiving Carer Allowance only, an income supplement, are in the non-income support carers class, Class 8.

What does the data tell us about Carers?

There were 271,541 people (3.4% of current welfare recipients) in the Carers class in the 2016 model population.

The following chart shows a breakdown of the number of people in the Carers class by age and gender.

Figure 47: 2016 profile of people in Class 4 – Carers (age/gender)

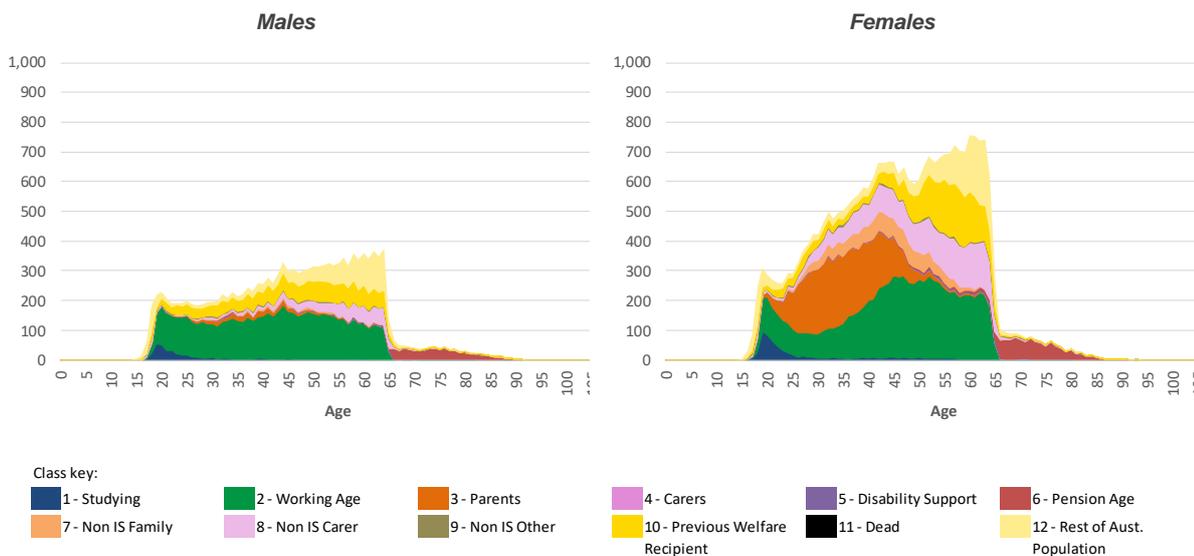


This class included significantly more women than men. The numbers in the class increase by age up to pension age and then reduce as most retire; however there are material numbers of people in the Carers class who are above retirement age.

Movements into this class

Over the last 3 years, an average of 40,600 people (around 15% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this by age, gender and previous class.

Figure 48: Number of people entering Class 4 – Carers (annual average over last 3 years)



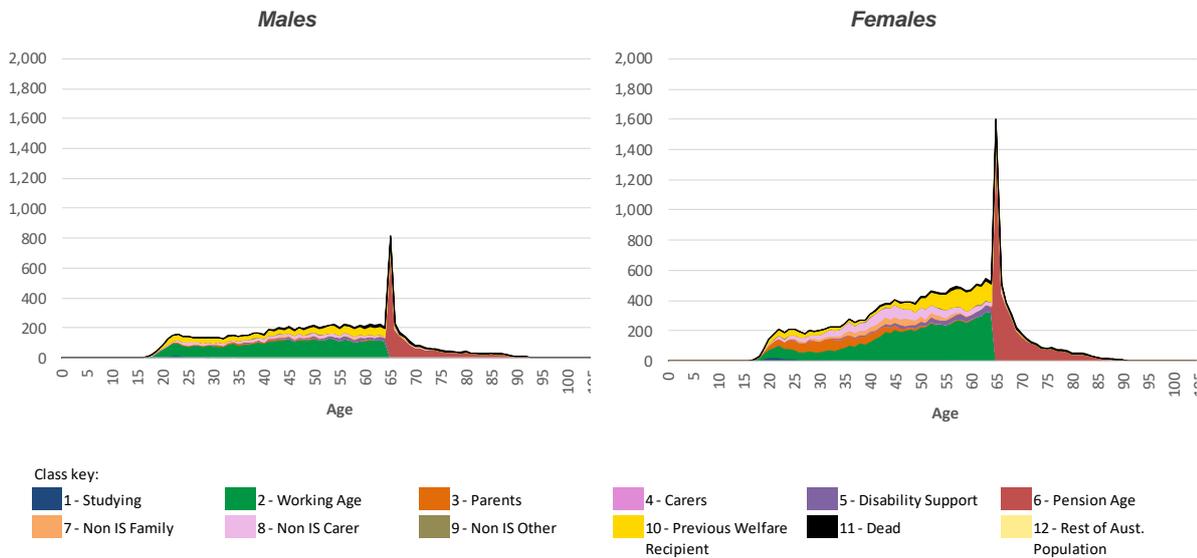
We can see that people in this class primarily came from another income support class, in particular from Working Age or, for women, Parents. A material proportion also enter this class having previously

been in the Non-Income Support Carers class. As age increases, a larger proportion of people (re-)enter the welfare system directly into this class.

Movements out of this class

Over the last 3 years, an average of 30,100 people (12%) per annum have transitioned out of the income support Carers class. As this is consistently less than the number of entrants it is not surprising that the class is growing. The following charts show the breakdown of this by age, gender and destination class.

Figure 49: Number of people leaving Class 4 – Carers (annual average over last 3 years)

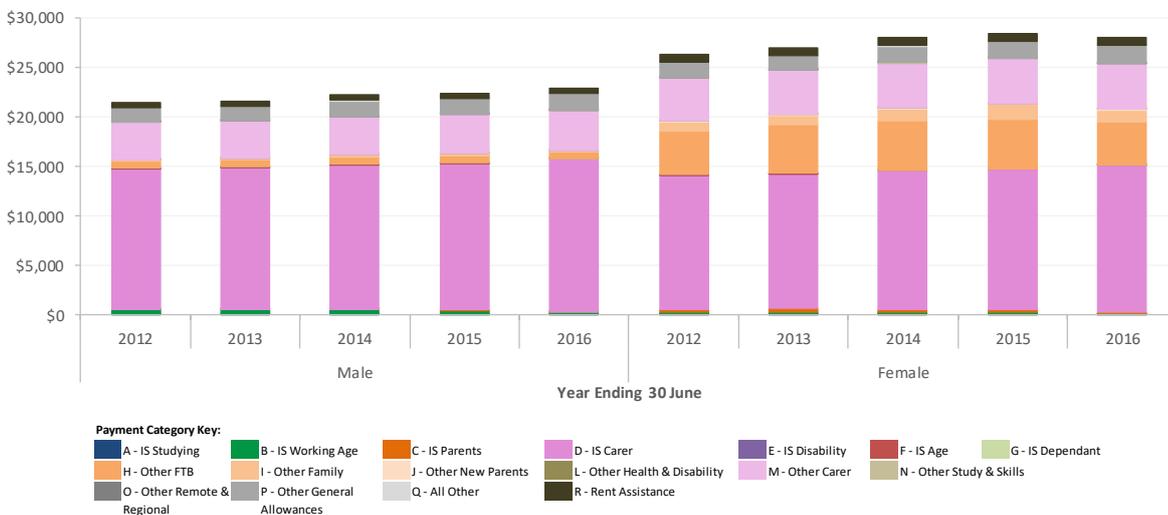


We can see that people in this class show more limited mobility. The main exits from the class are through retirement or movement to the Working Age class; only a small proportion of people from the class directly exit the welfare system. Some women also exit to the Parenting or Non-Income Support Carers classes.

Payments received

During 2015/16, people in this class received a total of \$7.2 billion. This is 6.5% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 50: Average payments per person in Class 4 – Carers (restated to 2015/16 \$ values)



People in this class receive some of the highest average annual payments. The average payment made in 2015/16 was \$26,500 with considerably higher average payments being made to women (\$28,100) than men (\$22,900), as a result of women being more likely to also be claiming FTB and other family payments.

What have we taken into account in fitting assumptions?

We have adopted class movement, utilisation and payment assumptions through consideration of the risk factors that influence the experience. At this valuation, we have also incorporated several new class characteristic variables, namely the care recipient's age, medical condition and relationship to carer.

Class movement assumptions

In developing the class movement assumptions for people in this class we observed that Carer is a very 'sticky' class, with more than 80% of recipients remaining in the class in any year. This is more so in recent years, after the introduction of allowances to supplement Carer income.

The model uses a combination of terms including the age, gender, partnership status, age of youngest child, care recipient characteristics, employment earnings indicator, and detail of other payment types and supplements previously received. The most significant variables for this model were whether the recipient had received a bereavement or crisis payment recently, their partnership status, the employment earnings indicator, and the care recipient's medical condition and relationship to carer.

Carers were more likely to leave this class if they had received a bereavement or crisis payment, which may be an indicator for the person being cared for passing away. Younger recipients were also more likely to leave to another income support class if they were single, perhaps reflecting that single carers have less assets and support, increasing their need and likelihood of meeting eligibility criteria for another income support payment.

Recipients caring for someone with cancer are more likely to leave the class, presumably because cancer patients either pass away or go into remission in a relatively short time frame compared to those with long-term conditions such as psychological conditions or intellectual disabilities. Of the younger carers, those that are caring for a partner are more likely to be long term recipients of income support.

People persist in this class up to and frequently beyond retirement age. Recipients who are within a year of being eligible for retirement or older are most likely to remain in this class if they are caring for a parent and most likely to transition to the age pension if they are caring for a child.

Payment utilisation and size assumptions

For the payment utilisation assumptions almost everyone in this class receives carers allowance or supplement as well as their carer payment and many of the people of parenting age also receive FTB and family payments, especially the women. Most also receive other general supplements and a portion receive rent assistance.

Around 55% of the annual cost is from the main carer payment and the amount of this is fairly consistent across people of all different ages, decreasing slightly with age. Conversely the utilisation of the FTB and family payments varies considerably by age with a clear concentration in the typical parenting age range.

We have continued to observe increases in the main carer payment average size over time. This is likely caused by longer durations on benefit, leading to a greater proportion of full year payments. Our average payment assumptions have again been based on the average of the experience over the last 2 years.

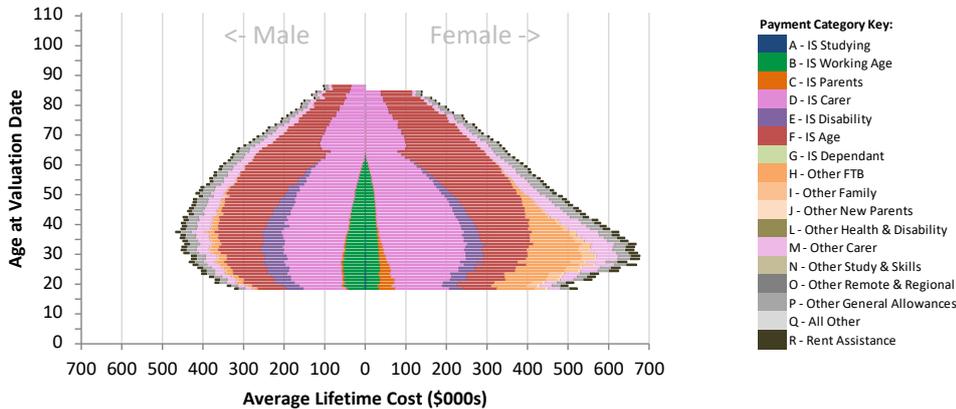
The model of payment levels for the main carer payment is a relatively simple model which includes details of the person's partner status and duration in class. These factors are correlated to their payment level and likelihood of receiving a full year rather than part year of payments.

What does the model show for Carers?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$119bn** (or **2.6%** of the total lifetime cost). The average lifetime cost for people in this class is **\$438,000**. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 51: Average lifetime cost by age and gender (Class 4)



For both genders these average lifetime costs include significant amounts of the carer payment and age pension and contributions from a range of supplementary payment categories. The costs are noticeably higher for women than men and especially so for those at young to mid ages. This arises from higher additional costs of FTB and family payments and from more women transitioning to parenting payments.

The average lifetime cost pyramid shows a small discontinuity at age 65 but then continues through the full age range reflecting the composition of people in the class. The discontinuity arises as many people move to the Age Pension class once they are over this age. For the small proportion of people who continue in this class once they are above their pension age, the average lifetime cost is mainly comprised of a mix of carer payments and the age pension.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$119bn is an increase of \$10bn compared to the baseline valuation. This was primarily driven by an increase in the average cost, although an increase in the number of people in this class also contributed:

- The number of people in this class has increased in line with our previous expectation for this class where numbers were expected to grow if the recent class entry experience continued.
- The average cost has increased by \$27,000 (6.5%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 32: Breakdown of change in average lifetime cost for Class 4 by payment category

	Total	IS			Non IS	
		Carer	Other (excl. Age Pension)	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$109bn					
Jun-16 Total Lifetime Cost	\$119bn					
Change in Total Lifetime Cost	+\$10bn (9.0%)					
Change due to Population	+2.3%					
Change due to Average Lifetime Cost	+\$27k (6.5%)	+\$13k	+\$7k	< \$1k	+\$4k	+\$3k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	-\$4k	< \$1k	-\$1k	-\$1k	< \$1k	< \$1k
- Impact of policy changes	-\$1k	< \$1k	< \$1k	< \$1k	-\$1k	< \$1k
- Impact of other changes	+\$31k	+\$13k	+\$8k	< \$1k	+\$5k	+\$3k

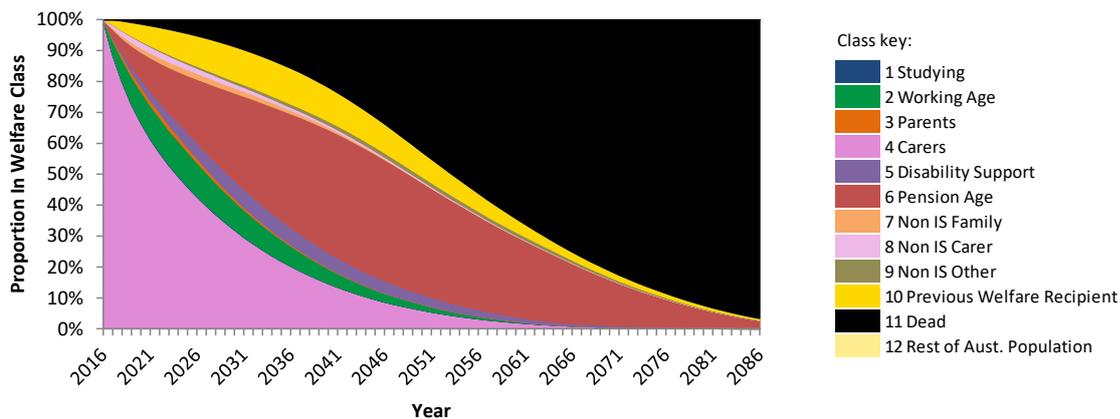
The increase in average cost has been primarily driven by:

- A gradual increase in the persistency rate of people in the Carers class over time, resulting in a longer projected duration on Carer payments (as well as income support in general);
- The impact of enhancing the projection model to include employment earnings – this leads to increased differentiation between population subgroups which are expected to have high persistency and subgroups which are expected to have low persistency. The high persistency subgroups within this class are contributing to this increased averaged lifetime cost, their identification results in a higher expected level of future income support payments.
- A lower long term unemployment rate assumption, which slightly reduces the projected future duration on working age benefits.
- The more refined modelling of the utilisation of FTB, family and new parents payments has contributed to the increased contribution of family supplements to the lifetime cost. The new models are better able to reflect people’s specific family composition.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 52: Expected future trajectory for people in Class 4



The model projections indicate that:

- More than 60% of the people in this class are expected to remain there for the next 5 years (or exit and subsequently return) and over 40% are expected to still be receiving the carers payment pension in 10 years’ time.
- For those who exit over the next 10 years:

Results for income support recipients

- Around two thirds of these move onto another income support payment. The biggest destination is age pension, although a material proportion of people move onto working age payments.
- Most of the remainder either exit the system or die.
- After 35 years, the majority of the original group are projected to either be on some form of income support payment (46%) or dead (45%).

Duration

The average future life expectancy for the income support Carer class is **37** years. This reflects that a significant proportion of this class is approaching retirement age. The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 33: Expected durations in welfare system for people currently in Class 4

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	16	42%
- Aged pension (class 6)	16	43%
Years with non-income support payments only	1	4%
Years not receiving any welfare payments	4	11%
Total	37	100%

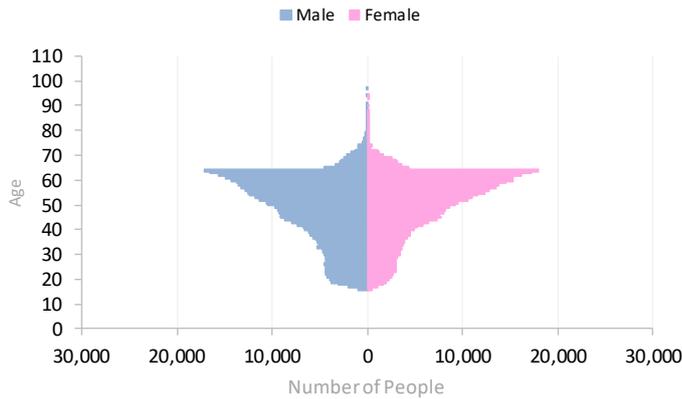
8.5 Disability Support Pensioners

What does the data tell us about Disability Support Pensioners?

There were 781,816 people (9.7% of current welfare recipients) in the Disability Support Pensioners (DSP) class in the 2016 model population.

The following chart shows a breakdown of the number of people in the Disability Support Pension class by age and gender.

Figure 53: 2016 profile of people in Class 5 – Disability Support (age/gender)

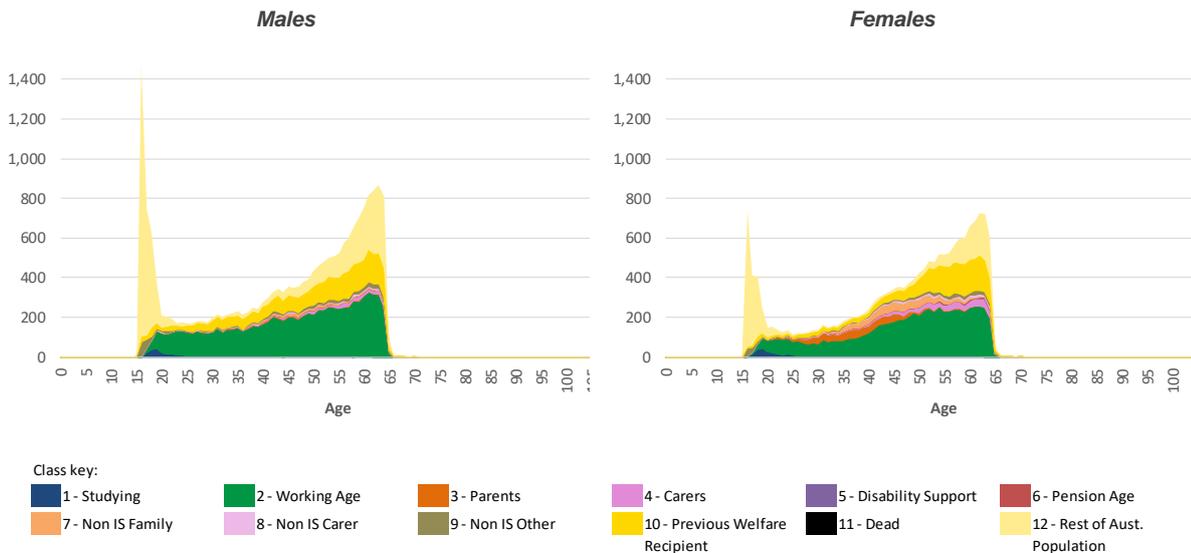


There are slightly more men than women in this class. The numbers in the class increase by age up to pension age and then reduce as most retire.

Movements into this class

Over the last 3 years, an average of 37,000 people (around 4% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this by age, gender and previous class.

Figure 54: Number of people entering Class 5 – Disability Support (annual average over last 3 years)



We can see that people in this class primarily came from the Working Age class, with the remainder mostly coming from outside the welfare system. The number of entries into DSP increases with age, up until retirement age.

We have observed a strong decreasing trend in the number of people entering this class over the last five years. The following table shows the number of entrants into this class over the last five years.

Table 34: Number of people entering Class 5 – Disability Support in the last 5 years

Financial Year	Male	Female	Total	% Reduction vs Previous Year
2011/12	32,188	28,097	60,285	
2012/13	29,924	26,797	56,721	-6%
2013/14	27,799	23,738	51,537	-9%
2014/15	22,757	18,840	41,597	-19%
2015/16	10,179	7,648	17,827	-57%

Note the figure for 2015/16 is likely to be materially impacted by data maturity and hence the reduction for this year will be less when the data is fully mature.

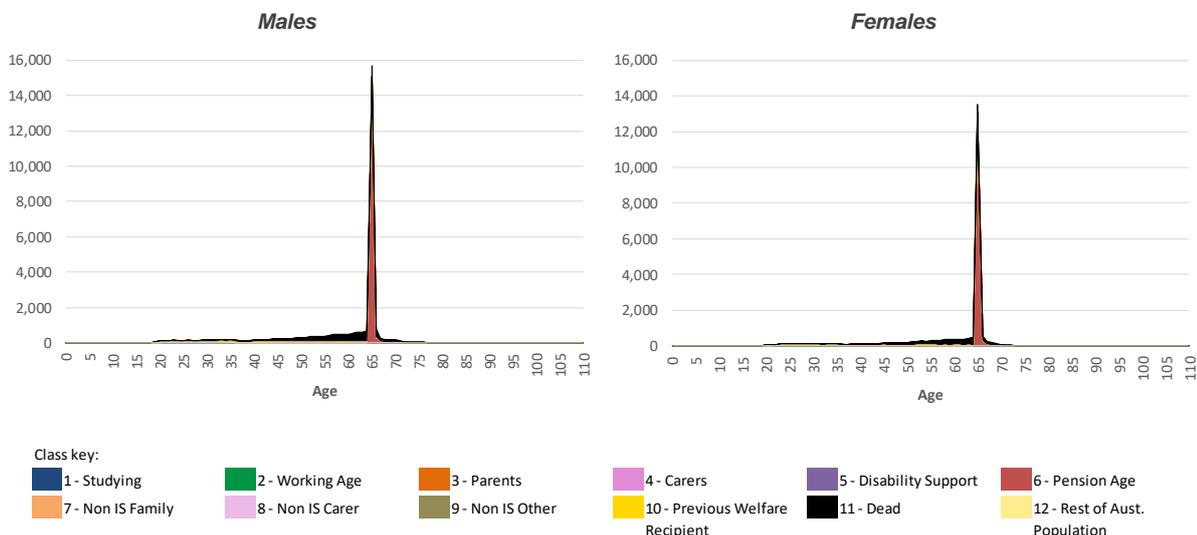
We have discussed this with the Department and understand this experience is likely to be a reflection of a series of policy changes that have been made over recent years, all tightening the eligibility criteria for the Disability Support Pension.

The reductions have varied across the different primary medical conditions, for example there was only a small reduction in entries for cancer-related conditions, but larger reductions for musculoskeletal and connective tissue disorders and poorly defined cause/chronic pain. Further insights are provided in section 14.3.

Movements out of this class

Over the last 3 years, an average of 52,900 people (6%) per annum have transitioned out of the Disability Support Pension class. The following charts show the breakdown of this by age, gender and destination class.

Figure 55: Number of people leaving Class 5 – Disability Support (annual average over last 3 years)



We can see that people in this class show very limited mobility. The main exits from the class are through retirement or death. Notwithstanding this, in the 2015/16 year, we have observed a material number of people aged under 40 exit the class, mainly into the other income support classes. This is a result of medical reviews conducted by the Department of Human Services (DHS), which are likely to result in a higher exit rate (relative to historical levels) in the short term. This experience can be seen in the table below, which shows the historic number of people leaving the Disability Support Pension class prior to retirement age.

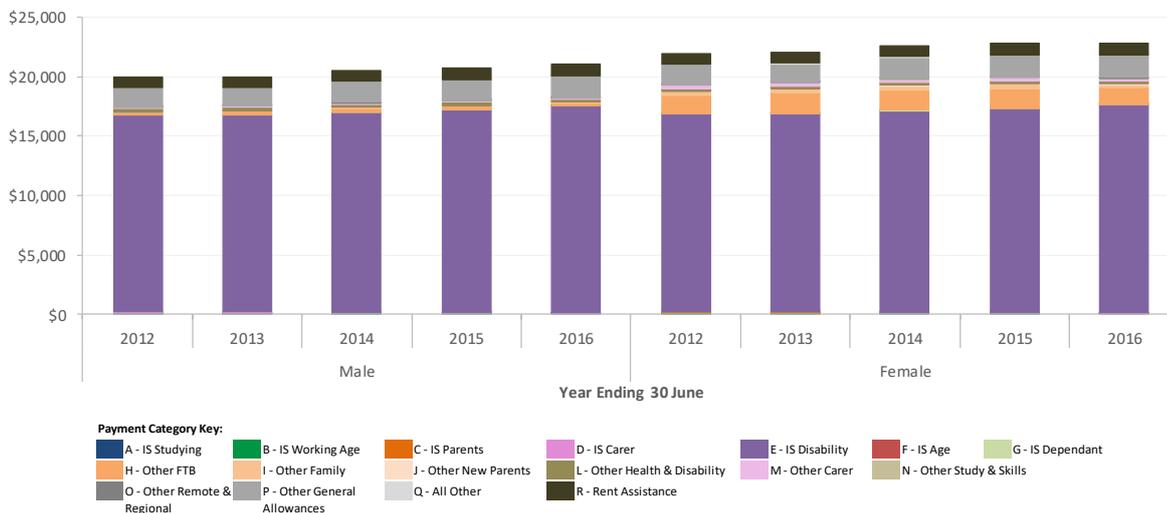
Table 35: Number of people leaving Class 5 – Disability Support prior to retirement in the last 5 years

Financial Year	Remaining in Class 5	Leaving Class 5 to an income support class	Leaving Class 5 and no longer on income support	Total
2011/12	715,329	1,181	20,029	736,539
2012/13	723,613	1,285	19,190	744,088
2013/14	720,280	1,186	18,044	739,510
2014/15	712,624	1,732	17,991	732,347
2015/16	694,181	5,378	17,890	717,449

Payments received

During 2015/16, people in this class received a total of \$17.4 billion. This is 15.6% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 56: Average payments per person in Class 5 – Disability Support (restated to 2015/16 \$ values)



The average payment made in 2015/16 was \$21,800 with slightly higher average payments being made to women than men, as a result of them being more likely to also be claiming FTB.

What have we taken into account in fitting assumptions?

We have adopted class movement, utilisation and payment assumptions through consideration of the risk factors that influence the experience. At this valuation, we have also incorporated newly provided information on whether the person received employment earnings and the primary medical condition of the DSP recipient.

Class movement assumptions

As discussed earlier, we noted that the movements into this class have been reducing year by year. This is the case for movements from all other classes, including entries from previous welfare recipients and the rest of the Australian population. This was observed at the baseline valuation, and the trend has continued in the 2015/16 with a large reduction in entries.

The results are highly sensitive to class transition assumptions given the long term nature of the projection model. As such, we have referenced the second latest year (2014/15) when determining assumptions for transitions into the Disability Support Pension class, which allows for the observed reducing trend but not to the extent observed in the latest year.

For existing DSP recipients, up until 2014/15, experience had been relatively stable with a very high proportion of people remaining on benefits for long periods of time; the persistency in class had grown slightly in the few years leading up to the baseline valuation. As discussed earlier, there have been a material number of people leaving the class in the latest year as a result of medical reviews being conducted by DHS. Given the long term nature of the projection model, we have therefore excluded the latest year of experience in determining long term transition assumptions. However, the lower number of people receiving DSP at the valuation date is reflected in the model population.

At this valuation, we have developed risk based class transition assumptions to allow for factors other than age and gender (such as the primary medical condition of the DSP recipient), although we note that the main movement out of this class is at retirement which is already allowed for in the foundation assumptions. Those few recipients who do leave the class (other than to move to class 6) tend to exit the system or return to the class they had been in previously, perhaps indicating a small subset of recipients with a temporary disability.

Those most likely to leave the class were those who had employment earnings, although such recipients are more likely to move to a non-income support class than to completely exit the system. This is an indication that people with a disability who find employment are likely to require some additional support, at least in the short term. Recipients with musculo-skeletal conditions or cancer were more likely to leave the class, whereas recipients with intellectual disabilities were more likely to remain on DSP.

Payment utilisation and size assumptions

For the payment utilisation assumptions around 5% to 10% of people receive FTB and Family payments, and around 10% receive Other Health & Disability payments. Almost everyone receives other general supplements.

The majority of the annual cost (around 80%) is from the main disability support payment. The remainder of the cost is mainly in the FTB, rent assistance and general supplement payment categories.

The main Disability Support Pension payment sizes have a slight downward shape by age; this may be a reflection of older people being more likely to be partnered which has a lower rate. Also lower rates are paid to people under 21. We have also observed an overall increase in the main disability support payment average size over the last 3 years. This is likely caused by longer durations on benefit. In recognition of the variations in past experience, the selected average payment assumptions have been based on the average of the experience over the last 2 years.

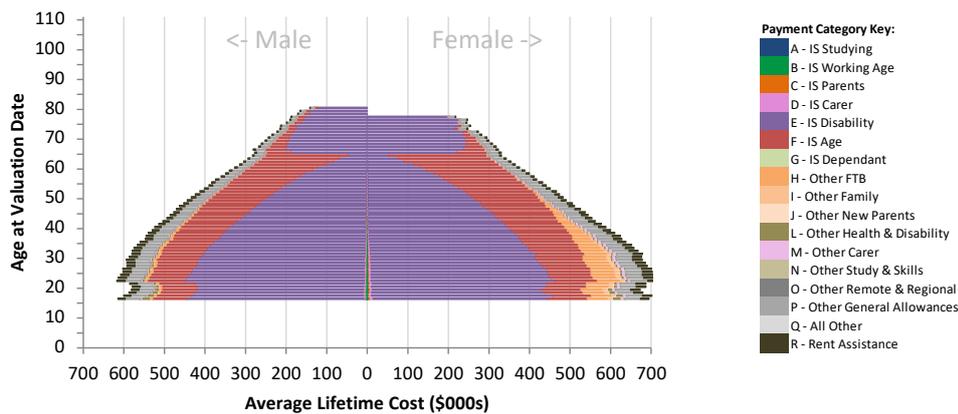
The model of payment levels for the main disability support pension is a relatively simple model which includes partner status, duration in class and earnings indicator. These factors are correlated to the persons' payment level and likelihood of receiving a full year rather than part year of payments.

What does the model show for current Disability Support Pensioners?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$352bn** (or **7.8%** of the total lifetime cost). The average lifetime cost for people in this class is **\$450,000**. It is interesting to note that this class represents around 10% of current welfare recipients but represents a greater proportion, 17%, of total lifetime costs for current welfare recipients. This is because these welfare recipients are less likely than average to exit the system. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 57: Average lifetime cost by age and gender (Class 5)



We can see that the most substantial part of this average lifetime cost is for the disability support pension itself, with the age pension also being a key component of the average lifetime cost for people below pension age. At all ages a number of supplements that are paid alongside the pension also contribute to the cost.

The average lifetime cost is higher for younger people with a steady reduction as people age. This is a reflection of the extremely high persistency in the payment system for people in this class – as people are not expected to exit the system, the main determinant of the lifetime cost is then the expected duration of the person’s future lifetime.

The average lifetime cost pyramid shows a change at age 65 as most people would leave this class and instead be in the Age Pension class once they are over this age. For the small proportion of people who continue in this class once they are above their pension age, the lifetime cost is comprised primarily of the disability support pension. This simply reflects the reduced likelihood of them transitioning to the age pension at some later stage.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$352bn is an increase of \$14bn compared to the baseline valuation. This was driven by an increase in the average cost, partially offset by a decrease in the number of people in this class:

- Both higher exits (most likely a result of the medical reviews) and lower new entrant numbers into DSP (likely a result of the tightened eligibility assessment process) have contributed to a lower number of people (population) in this class. These changes do not directly impact the average lifetime cost for those people remaining in the class.
- The average cost has increased by \$34,000 (8.1%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 36: Breakdown of change in average lifetime cost for Class 5 by payment category

	Total	IS			Non IS	
		Disability Support	Other (excl. Age Pension)	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$338bn					
Jun-16 Total Lifetime Cost	\$352bn					
Change in Total Lifetime Cost	+\$14bn (4.0%)					
Change due to Population	-3.8%					
Change due to Average Lifetime Cost	+\$34k (8.1%)	+\$23k	< \$1k	+\$8k	< \$1k	+\$3k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of policy changes	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of other changes	+\$33k	+\$23k	-\$1k	+\$8k	< \$1k	+\$3k

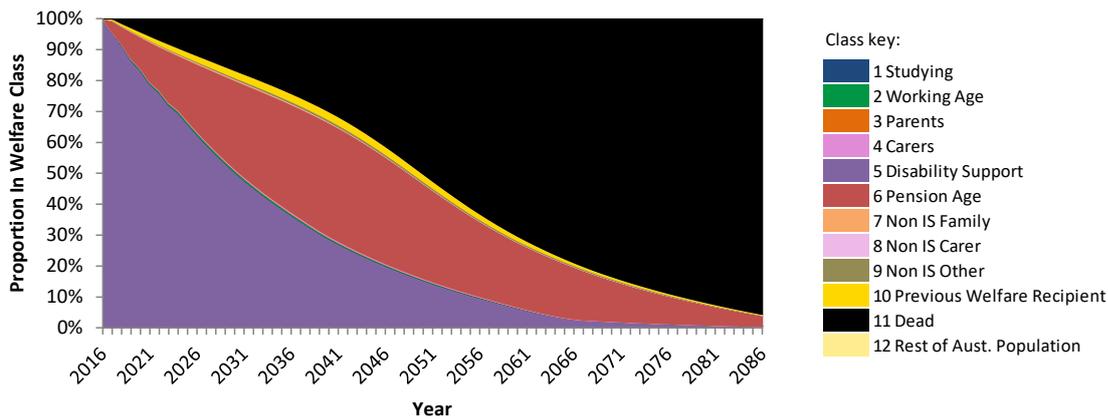
The increase in average cost has been primarily driven by:

- The impact of using the revised mortality assumptions for this class, which increases the length of people’s future lifetime for those people who do not have cancer (typically those people entering this class at younger ages).
- The impact of enhancing the projection model to include the medical condition. This leads to increased differentiation between population subgroups which are expected to have high persistency and subgroups which are expected to have low persistency. The high persistency subgroups within this class are contributing to this increased averaged lifetime cost, their identification results in a higher expected level of future income support payments.
- A flow on impact onto other payment categories, in particular a higher proportion of people remaining on DSP resulting in a higher proportion also receiving the age pension after retirement.

Future outcomes

In developing the valuation results, the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 58: Expected future trajectory for people in Class 5



This reinforces the observation that most people only exit this class through death or retirement.

- More than 60% of the people in this class are expected to remain there for the next 10 years (or exit and subsequently return) and 36% are expected still to be receiving disability support pension in 20 years’ time.
- 55% of the people currently in the class are expected to be receiving either DSP or age pension in 30 years’ time (and are most likely to also do so for all the intervening years).

Duration

The average future life expectancy for the Disability Support class is **34** years. This reflects that a significant proportion of this class is approaching retirement age.

The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 37: Expected durations in welfare system for people currently in Class 5

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	18	52%
- Aged pension (class 6)	15	43%
Years with non-income support payments only	0	1%
Years not receiving any welfare payments	1	3%
Total	34	100%

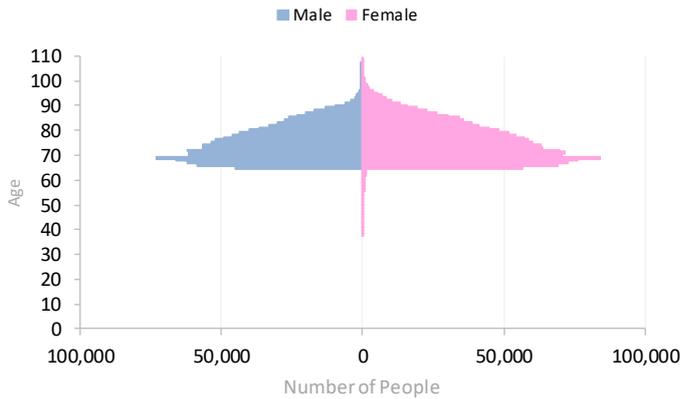
8.6 Age Pensioners

What does the data tell us about Age Pensioners?

There were 2,550,939 people (31.7% of current welfare recipients) in the Age Pension class in the 2016 model population; it is the biggest income support class by a considerable margin.

The following chart shows a breakdown of the number of people in the Age Pension class by age and gender.

Figure 59: 2016 profile of people in Class 6 – Pension Age (age/gender)

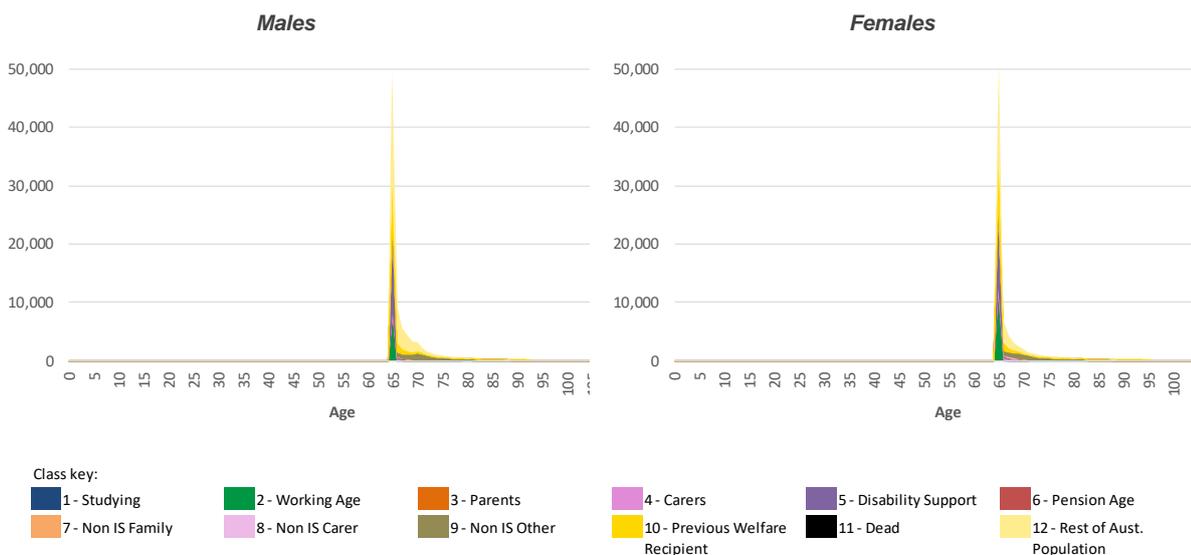


The class includes a mix of both men and women albeit with slightly more women. This is most likely a result of greater female longevity. The vast majority of people in the class are past pension age, however a small number of younger people have been included through their receipt of the wife pension.

Movements into this class

Over the last 3 years, an average of 164,700 people (around 6% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this by age, gender and previous class.

Figure 60: Number of people entering Class 6 – Pension Age (annual average over last 3 years)



From the charts, we can see that the majority of people enter the class on reaching their age pension qualifying age (pension age). Prior to entering the Age Pension class these people were in a mix of classes, both inside and outside the welfare system. Those arriving from elsewhere in the welfare

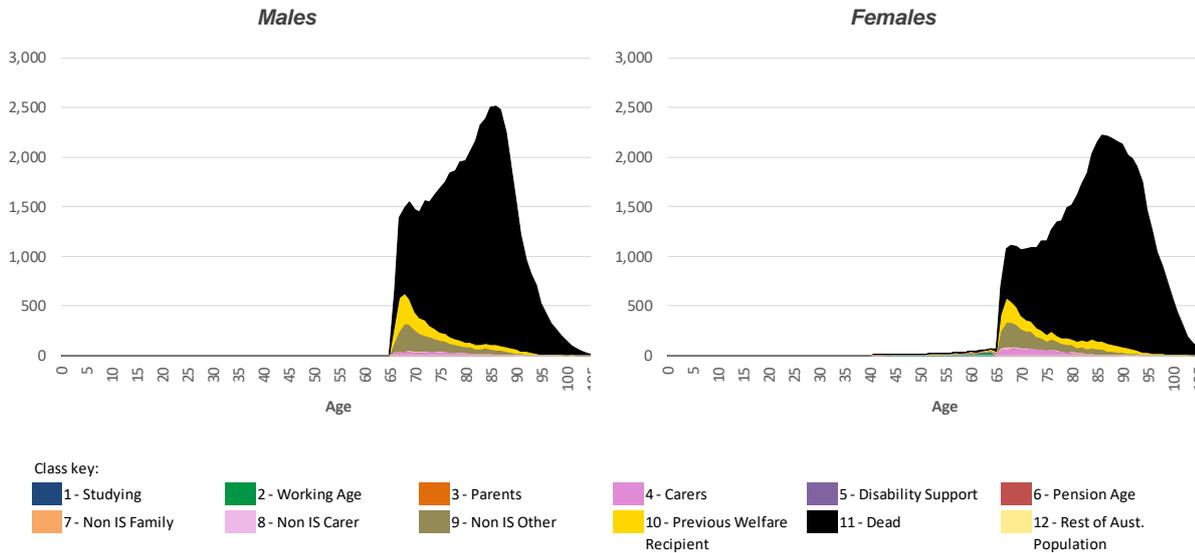
Results for income support recipients

system were mostly from the Working Age or Disability Support Pension classes (these being the main pre-retirement classes available to older working age people).

Movements out of this class

Over the last 3 years, an average of 104,900 people (4%) per annum have transitioned out of the Pension Age class. The following charts show the breakdown of this by age, gender and destination class.

Figure 61: Number of people leaving Class 6 – Pension Age (annual average over last 3 years)

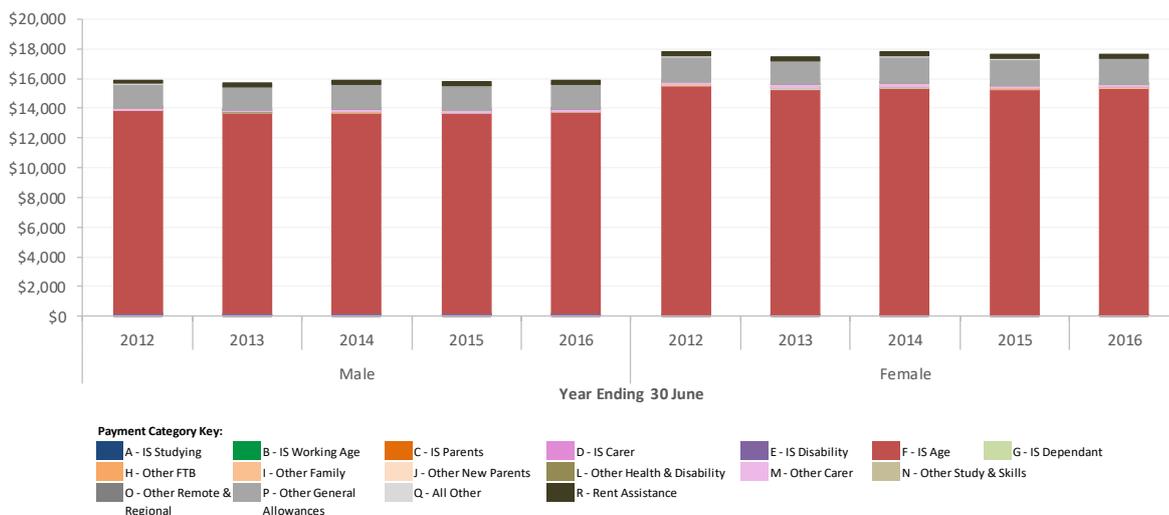


A small number of people leave the class (presumably as a result of changes in their personal circumstances), otherwise people exit at the end of their lives.

Payments received

During 2015/16, people in this class received a total of \$44.6 billion. This is 40.0% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 62: Average payments per person in Class 6 – Pension Age (restated to 2015/16 \$ values)



The average payment made in 2015/16 was \$16,800. The average payments are slightly higher for women than men, possibly as a result of more of them receiving the single rate.

What have we taken into account in fitting assumptions?

The main movement out of this class is through mortality, and the majority of the annual cost (over 85%) is from the main age pension payment. Thus, our focus for this class was in developing risk based assumptions for the main age pension payment and in understanding the trends in the mix of pensions that will occur in future years.

Class movement assumptions

People from all welfare classes generally move into the Age Pension class on reaching age pension qualifying age ('pension age'). Once in the Age Pension, people generally stay there until death, with only a small number of movements to the Carer class and a small number of exits. Hence, class movements, other than mortality, were modelled using foundation assumptions that take into account age and gender only.

Payment utilisation and size assumptions

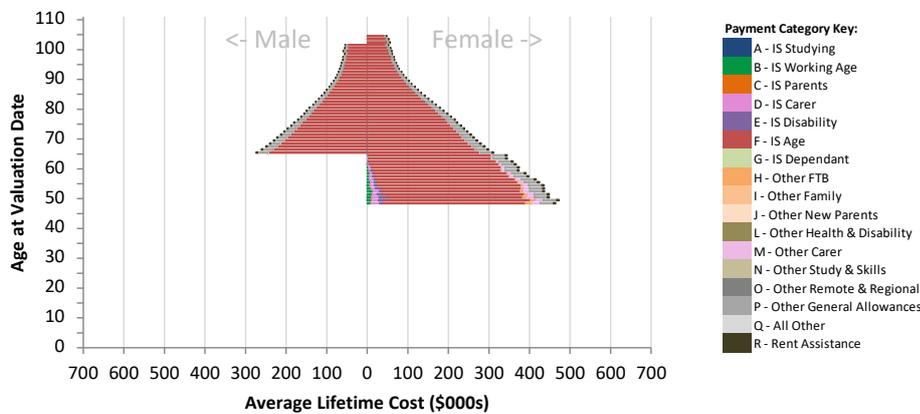
Our approach for modelling the main age pension payment is described in detail in section 5.8. This reflects a number of risk characteristics including the persons' partner status, the age at which they entered the Age Pension class and whether they entered from another income support class. After the main income support age pension payments, the other general allowance category is the largest component of the cost and has been modelled as a loading to the main pension.

What does the model show for current Age Pensioners?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$518bn** (or **11.5%** of the total lifetime cost). The average lifetime cost for people in this class is **\$203,000**. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 63: Average lifetime cost by age and gender (Class 6)



The pyramid or 'inverse funnel' shape illustrates the reductions in average lifetime cost as age increases. This is simply a function of the expected future lifetimes for people who have currently reached the ages shown. The average lifetime costs range from around **\$290,000** for people at age 65 to around **\$90,000** when people reach age 90. As can be seen, almost all of the cost is from the age pension; the remainder is the cost of the pension supplements and living allowance payment types (e.g. energy supplement) that are paid alongside the pension.

There are very small numbers of people in this class below retirement age (approx. 10,000 people or around 0.4% of the class). Typically these are people receiving the wife pension. The existence of this group extends the pyramid to younger ages and the average lifetime costs are larger again as a result of the combined effect of the longer future lifetime and the expectation of this group being highly likely to remain in the class for the remainder of their lifetimes.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$518bn is a slight increase of \$11bn compared to the baseline valuation. This has been primarily driven by an increase in the number of people in this class compared to the previous valuation:

- The number of aged pensioners has increased by 2.2%; this is in line with expectations and is a result of changes in underlying demographics.
- The average cost has not changed significantly since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 38: Breakdown of change in average lifetime cost for Class 6 by payment category

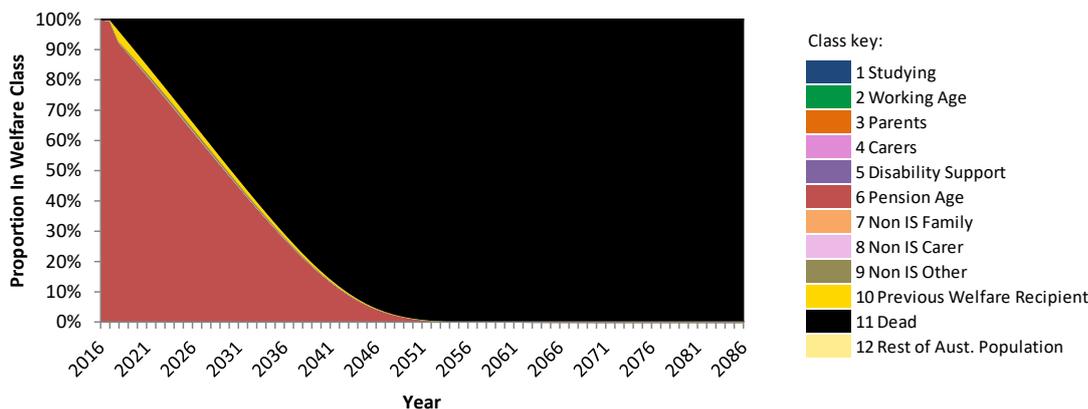
	Total	Income Support		Non-Income Support	
		Non Age Pension	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$507bn				
Jun-16 Total Lifetime Cost	\$518bn				
Change in Total Lifetime Cost	+\$11bn (2.1%)				
Change due to Population	+2.2%				
Change due to Average Lifetime Cost	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of policy changes	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of other changes	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k

As can be seen from the table most of the changes made at this valuation have minimal impact on the lifetime cost assessment for the older group of people who comprise this class.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 64: Expected future trajectory for people in Class 6



We can see that a very small proportion of this class exit and, as is intended for age pensioners, the rest stay on the payment for their remainder of their natural lives.

Duration

The average future life expectancy for the Age Pension class is 15 years. This reflects the age profile of this class. The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 39: Expected durations in welfare system for people currently in Class 6

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	<1	0%
- Aged pension (class 6)	14	95%
Years with non-income support payments only	<1	1%
Years not receiving any welfare payments	<1	3%
Total	15	100%

9 Results for non-income support recipients

9.1 Non income support – Family

People are in this class if they have not received any income support payment in the financial year but have received a FTB, family or new parent payment.

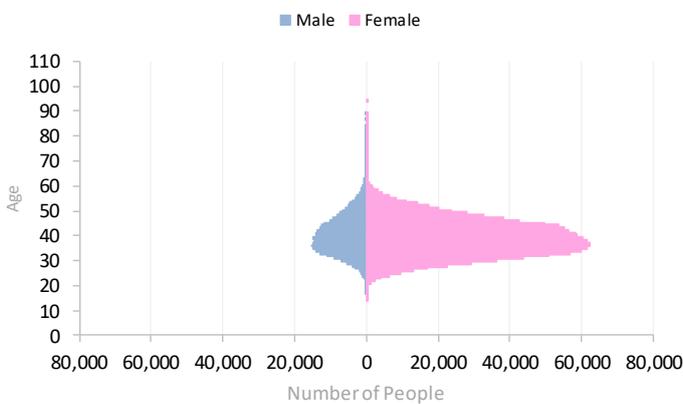
The precise definition of this class includes a one year timing lag as explained in section 3.4. This means that people typically enter the class via class 9 and spend a year in that class before moving to class 7 for the remainder of the period during which they are receiving any of the family payment categories.

What does the data tell us about the Non IS Family class?

There were 1,553,941 people (19.3% of current welfare recipients) in the Non IS Family class in the 2016 model population.

The following chart shows a breakdown of the number of people in the Non IS Family class by age and gender.

Figure 65: 2016 profile of people in Class 7 – Non IS Family (age/gender)

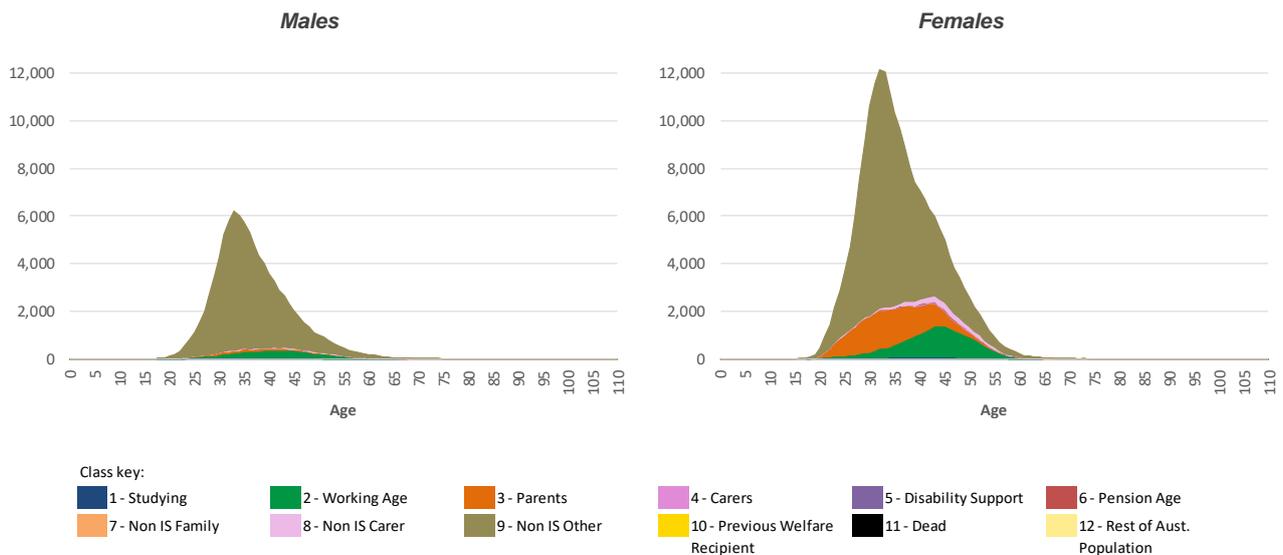


This class includes some men and a much greater number of women. The numbers are concentrated in the age range 20 to 60.

Movements into this class

Over the last 3 years, an average of 298,600 people (around 19% of the people in this class) per annum enter this class from another welfare class (note that due to the lagged definition, it is not possible to transition directly into this class from outside the welfare system). The following charts show the breakdown of this by age, gender and previous class.

Figure 66: Number of people entering Class 7 – Non IS Family (annual average over last 3 years)

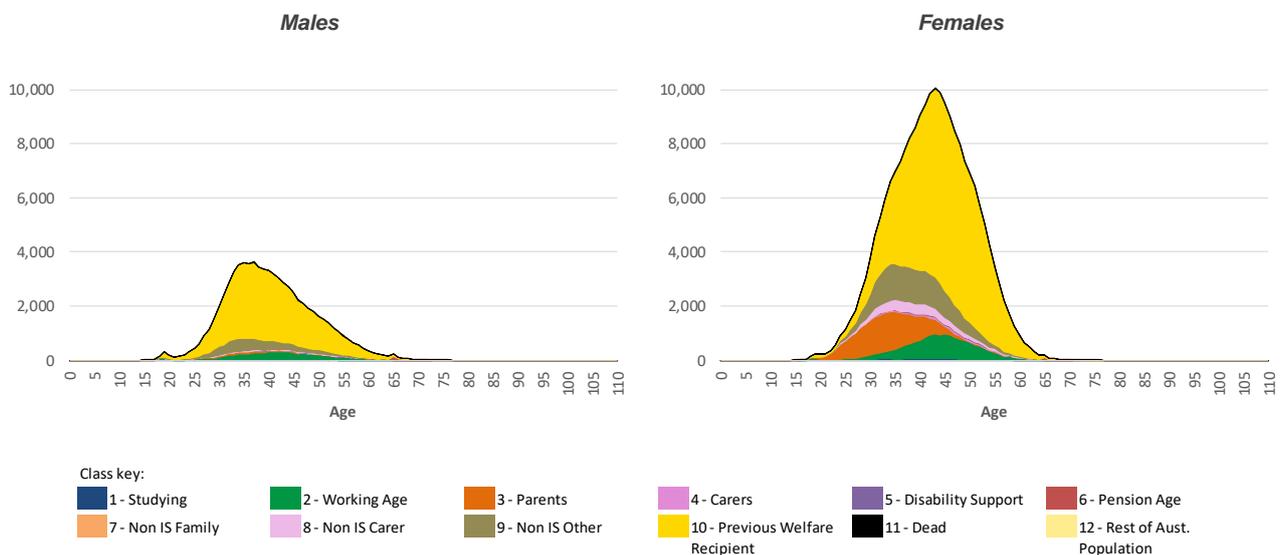


We can see that people in this class primarily came from class ‘9 Non IS Other’; this is usually around the time they first have children or take on care of children. For women, a proportion also enter from the Working Age and Parents classes; transitions from Parents are likely due to the welfare recipient’s dependent children becoming older than the eligibility age for parenting payments.

Movements out of this class

Over the last 3 years, an average of 287,100 people (19%) per annum have transitioned out of the Non IS Family class. The following charts show the breakdown of this by age, gender and destination class.

Figure 67: Number of people leaving Class 7 – Non IS Family (annual average over last 3 years)

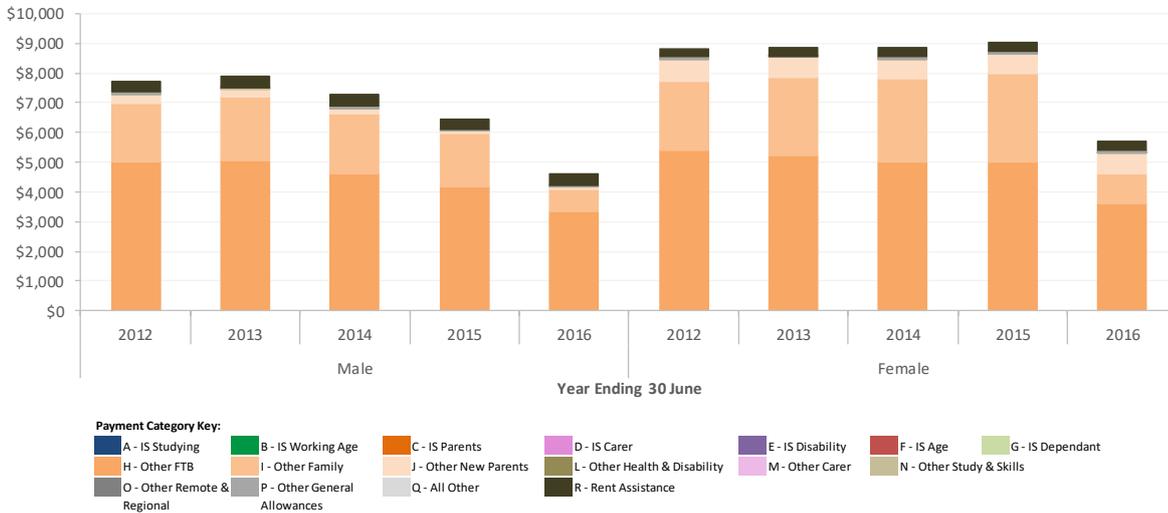


People in this class are relatively mobile, with people typically entering for a number of years and then exiting. Most people leaving this class will also cease to receive any other welfare payments. People often exit this class as their children grow up and no longer fulfil the FTB eligibility requirements or leave the household.

Payments received

During 2015/16, people in this class received a total of \$8.5 billion. This is 7.6% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 68: Average payments per person in Class 7 – Non IS Family (restated to 2015/16 \$ values)



As shown in the chart above, the average amount per person for 2015/16 is significantly lower than prior years. This is due to the latest year being understated, as it will not fully reflect all FTB and family payments as these can be received as part of an income tax assessment post 30 June.

The average payment made in 2014/15 (noting the understating of 2015/16) was \$8,500 with higher average payments being made to women (\$9,000) than men (\$6,500) partly as a result of them being more likely to also be claiming New Parents allowance. This average amount per person is much lower than that for people in the income support classes.

What have we taken into account in fitting assumptions?

We have adopted class movement, utilisation and payment assumptions through consideration of the risk factors that influence the experience.

Class movement assumptions

In undertaking the analysis to develop the class movement assumptions we noted that there have been many policy changes over recent years, with eligibility criteria tightened for both FTB A and FTB B. Offsetting these, FTB A payments increased for young dependants undertaking full time study, making it more financially beneficial than Youth Allowance. Altogether, these made entries into and exits out of Non-IS Family quite volatile in the past. However, in the latest two years, the class movement rates appear to be beginning to stabilise, and therefore we have generally based assumptions on the latest two years of experience.

At this valuation, we have further refined the model for class transitions to consider risk factors such as partnering status, number and ages of children, and detail of other payment types and supplements previously received.

Owing to the lagged definition of this class, it is not possible for someone who received FTB, family or new parent payments in the previous year to transition to Non IS Other or exit the system. While these people could move to an income support class, we found that they are most likely going to remain in this class (around 96% of them remain from year to year). For this group, those who left this class generally moved to the Parents class and were usually less than 30 years old, perhaps reflecting that this is the age group who are most likely to have children under the eligibility age threshold for parenting payments. Those who were single were more likely to move to an income support class (as opposed to remain in this class) compared to those who were partnered, perhaps reflecting that single people were more likely to be in financial hardship and hence require income support.

People who did not receive FTB, family or new parent payments in the previous year are not able to remain in this class by definition. These people mostly exit the system in the following year; those who do not exit are most likely to move to the Non IS Other class. Again, those who were single were more likely to transition into an income support class. People with children were also more likely to remain in the welfare system.

Payment utilisation and size assumptions

For the payment utilisation assumptions, most people receive FTB, family and other general allowances. Around 14% receive rent assistance payments and 10% also receive new parent payments. Very few people receive the remaining payment categories. At this valuation we have developed risk models for the utilisation for each of the abovementioned categories.

In addition to age and gender, the FTB, other family and new parenting utilisation models draw on a range of information including age of youngest child, whether people have children of different ages, partner status, duration in class and previous welfare utilisation. Together these factors reflect information on the household's eligibility for FTB and whether the individual is likely to be the person claiming on behalf of the household.

The utilisation model for other general allowances is a relatively simple model that takes into account gender and utilisation of FTB payments. In addition to age and gender, the utilisation model for rent assistance considers number and age of children, Indigenous status, partner status, education level and previous utilisation of this payment category.

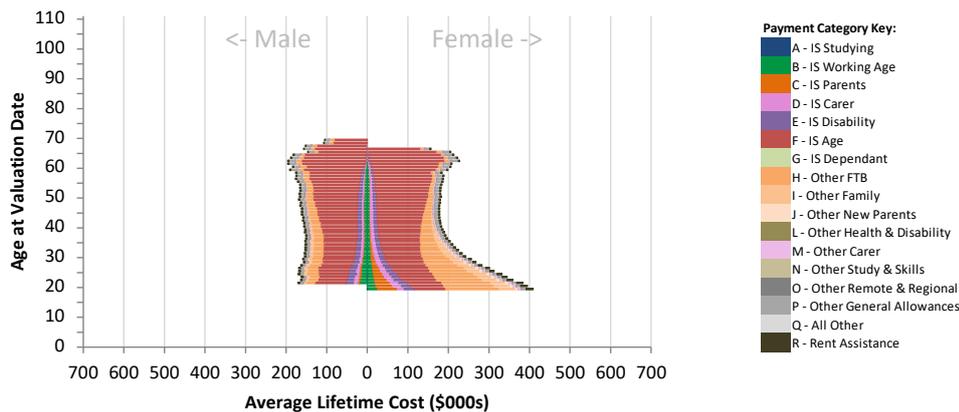
FTB (60%) and family payments (30%) comprise the majority of the cost and at this valuation, we have developed risk models for these payment categories. The average sizes for these payments generally decrease from age 40 onwards, likely related to children reaching the maximum eligible age for FTB. The overall average sizes of FTB have increased slightly over time, driven by an increase in the average payment size for FTB A payments. The risk models for FTB and family payments include factors such as number and age of children, partner status and previous welfare utilisation.

What does the model show for people currently in the Non IS family class?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$301bn** (or **6.7%** of the total lifetime cost). The average lifetime cost for people in this class is **\$194,000**, with the lifetime cost being higher for women (**\$202,000**) than for men (**\$159,000**). The variation by age and gender illustrated in the figure below.

Figure 69: Average lifetime cost by age and gender (Class 7)



The most substantial part of this average lifetime cost for both genders is for the age pension.

For women there are significant contributions from FTB and family payments. These are especially material for women in their late teens and twenties but then decline as ages increase. For people in their early forties and above, the differences between the costs for men and women are small.

The average lifetime cost pyramid shows a significant change at age 65 with much lower costs for older people:

- For people below age 65 - the age pension component of the average lifetime cost is significant as there is a high chance of the people moving onto the age pension as they reach pension age.
- For people above age 65 - to be above age 65 and still be in this class they cannot be receiving age pension at present. This means they are far less likely to receive the age pension in future than a typical person in the population and hence have a lower average lifetime cost.

For people significantly above age 65 the average lifetime costs reduce year on year as the future lifetime is shorter and the chances of moving into the Age Pension class at a future point in time are even lower.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$301bn is a decrease of \$41bn compared to the baseline valuation. This was driven by a decrease in the average cost (as opposed to a change in population in this class):

- The number of people in this class has remained relatively similar (0.5% higher) to the previous valuation, with expected exits from the class being offset by higher entries than expected.
- The average cost has decreased by \$27,000 (12.3%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 40: Breakdown of change in average lifetime cost for Class 7 by payment category

	Total	Income Support		Non-Income Support	
		Non Age Pension	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$342bn				
Jun-16 Total Lifetime Cost	\$301bn				
Change in Total Lifetime Cost	-\$41bn (11.9%)				
Change due to Population	+0.5%				
Change due to Average Lifetime Cost	-\$27k (12.3%)	-\$15k	-\$3k	-\$4k	-\$5k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economic module	-\$7k	-\$4k	-\$2k	< \$1k	< \$1k
- Impact of policy changes	-\$2k	< \$1k	< \$1k	-\$2k	< \$1k
- Impact of other changes	-\$19k	-\$12k	-\$1k	-\$2k	-\$4k

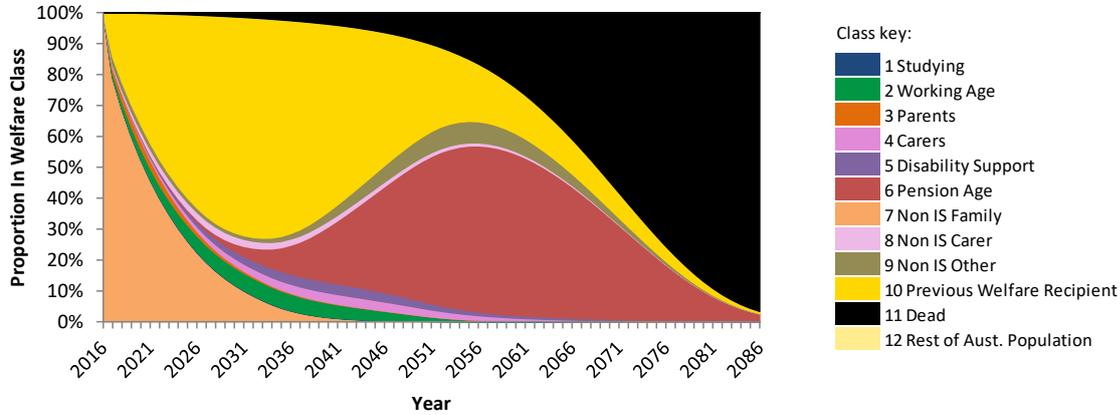
The reduction in average cost has been primarily driven by:

- Lower re-entries from outside the welfare system, reducing the likelihood of these people returning to income support (in particular working age payments) after they leave the system;
- Lower transition rates into disability support pension from most classes; and
- A reduction in the assumed long term unemployment rate, which reduces the likelihood of people utilising income support (in particular working age payments) in their future lifetime.
- The more refined modelling for the movements out of this class and for the utilisation of FTB, family and new parents payments has contributed to the reductions as the new models are better able to reflect people’s specific family compositions.
- Part of the reductions in family supplements is as a result of the policy changes to FTB and child care.

Future outcomes

In developing the valuation results, the projection model produces information on the expected transitions for people out of each class, as shown below.

Figure 70: Expected future trajectory for people in Class 7



We can see that:

- 46% of people are expected to stay in this class for the next 5 years (or exit and return) and 22% for the next 10 years. This pattern of behaviour is likely to be determined by the eligibility criteria for family tax benefit (linked to child ages) and child care benefits as these are the main payment types which cause people to be in this class.
- The majority of the people who exit this class exit the payment system.
- A small proportion of people move onto a different payment at the point they exit this class, with the most common destinations first being working age payments, then the two carer classes, and then later being the age pension.

Duration

The average future life expectancy for the Non IS Family class is **51** years. This reflects that the age profile of this class is well distributed across the ages 25 to 55.

The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 41: Expected durations in welfare system for people currently in Class 7

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	4	8%
- Aged pension (class 6)	16	32%
Years with non-income support payments only	9	17%
Years not receiving any welfare payments	22	43%
Total	51	100%

9.2 Non income support – Carers

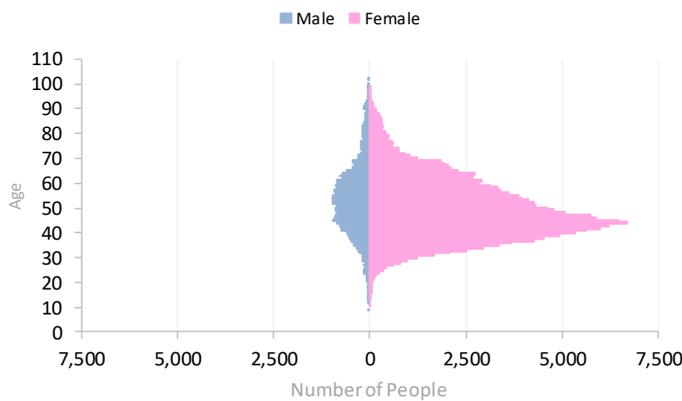
As noted previously, this class includes those people receiving Carer Allowance or Carer Supplement, who do not also receive any Carers Payment. People receiving the Carers Payment are in class 4 and have been discussed in section 8.4.

What does the data tell us about Non IS Carers?

There were 200,678 people (2.5% of current welfare recipients) in the Non IS Carers class in the 2016 model population; it is the smallest of all the classes.

The following chart shows a breakdown of the number of people in the Non IS Carers class by age and gender.

Figure 71: 2016 profile of people in Class 8 – Non IS Carers (age/gender)

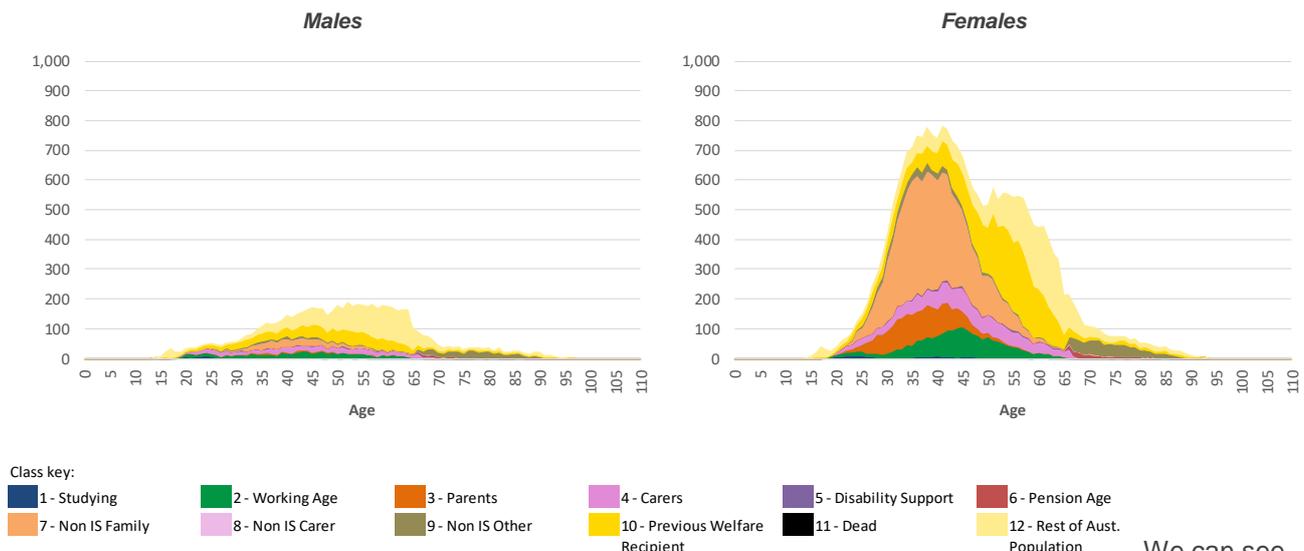


This class has many more women than men. The numbers in the class increase up to around age 45 and then reduce, however material numbers of people stay in the class after retirement age.

Movements into this class

Over the last 3 years, an average of 31,300 people (around 15% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this by age, gender and previous class.

Figure 72: Number of people entering Class 8 – Non IS Carers (annual average over last 3 years)



Class key:

- 1 - Studying
- 2 - Working Age
- 3 - Parents
- 4 - Carers
- 5 - Disability Support
- 6 - Pension Age
- 7 - Non IS Family
- 8 - Non IS Carer
- 9 - Non IS Other
- 10 - Previous Welfare Recipient
- 11 - Dead
- 12 - Rest of Aust. Population

We can see that women in this class primarily came from class '7 Non IS Family', but with material numbers also coming from Working Age, Parents and Carers (income support) as well. This is likely a result of women with children ceasing to become eligible for parenting and/or FTB payments as their children age.

Results for non-income support recipients

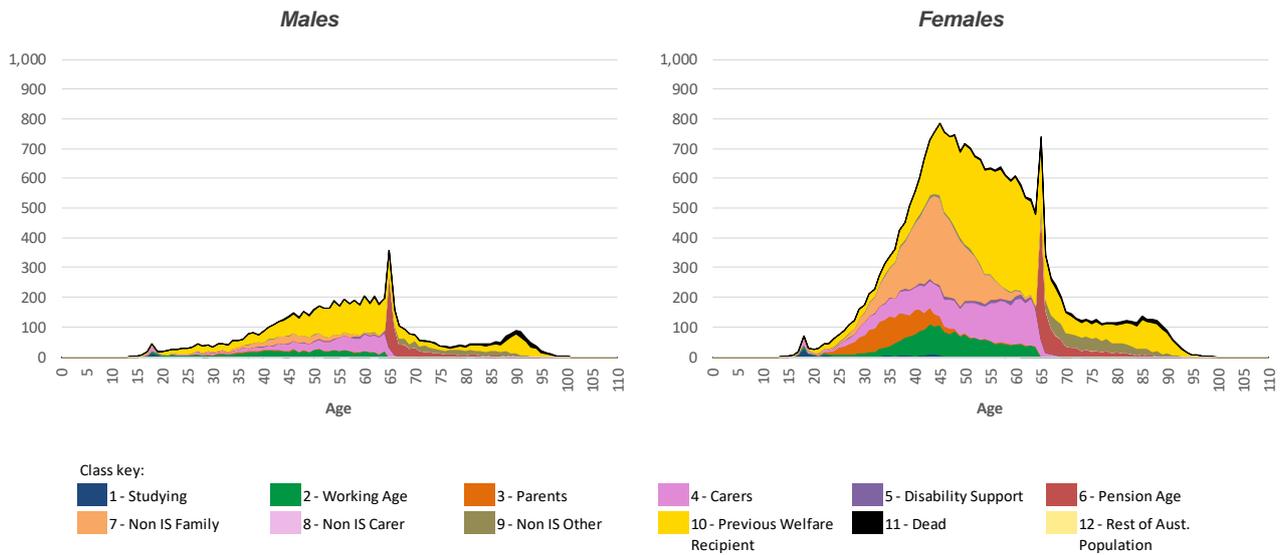
Men in this class primarily entered this class directly from outside the welfare system, although a small proportion had previously been in Working Age, Carer (income support) or Non IS Family.

As age increases, a larger proportion of people (re-)enter the welfare system directly into this class.

Movements out of this class

Over the last 3 years, an average of 32,000 people (16%) per annum have transitioned out of the Non IS Carers class, a similar number to those who have entered this class (31,300 p.a. on average). The following charts show the breakdown of this by age, gender and destination class.

Figure 73: Number of people leaving Class 8 – Non IS Carers (annual average over last 3 years)



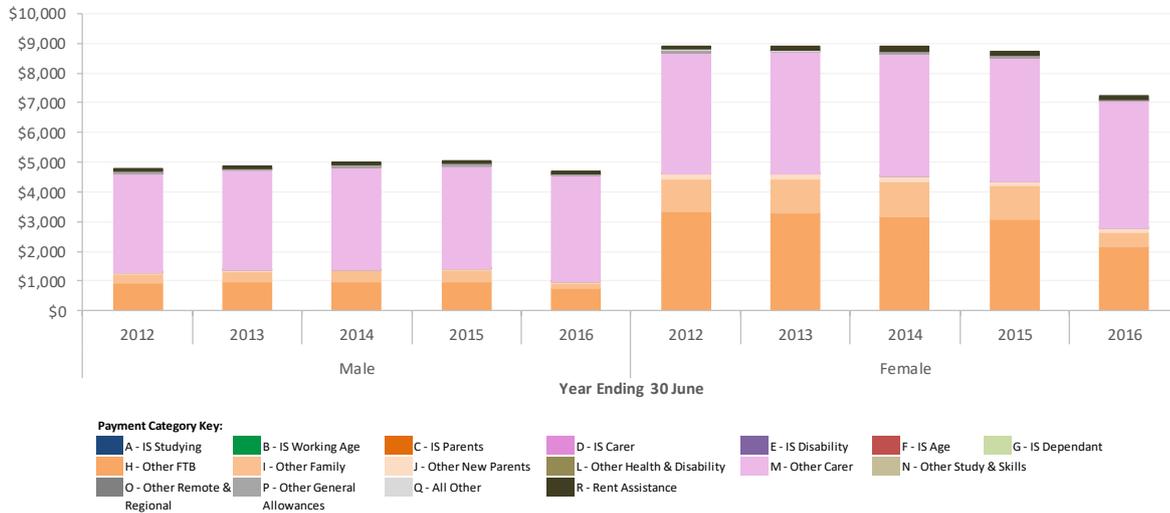
People leaving the Non IS Carers class typically exit the payment system or, for women, move to the Non IS Family class. A smaller proportion of people move to the carer class, Working Age class or (for women) the Parenting class.

People in this class have shown somewhat limited mobility; this is more so for women than for men. As people are typically caring for a partner, child or other adult (e.g. disabled person or parent) this may reflect a different mix of people being cared for.

Payments received

During 2015/16, people in this class received a total of \$1.4 billion. This is 1.2% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 74: Average payments per person in Class 8 – Non IS Carers (restated to 2015/16 \$ values)



As shown in the chart above, the average amount per person for 2015/16 is significantly lower than prior years, especially for women. This is due to the latest year being understated, as it will not fully reflect all FTB and family payments as these can be received as part of an income tax assessment post 30 June.

The average payment made in 2014/15 (noting the understating of 2015/16) was \$8,100 with higher average payments being made to women (\$8,700) than men (\$5,000) as a result of them being more likely to also be claiming FTB and family payments. This average amount per person is much lower than that for people in the income support classes.

What have we taken into account in fitting assumptions?

Similar to Income Support Carer, Non-IS Carer is a very stable and persistent class. In this class, everyone receives the carer allowance and/or supplement, while 30% of people receive the FTB, family and other living payments (with utilisation of these other payments primarily reflecting the typical ages during which people have children). Therefore, also noting the smaller numbers of people and payments made for this class, we have focused on developing risk based assumptions for class movements only, while retaining foundation assumptions based on age and gender for payment utilisation and size assumptions. For the class movement assumptions, we have incorporated several new class characteristic variables at this valuation, namely the number of adult and child care recipients.

Class movement assumptions

This is a stable class where most recipients stay in the class, but the experience is differentiated between that for those people who are at least a year below retirement age and those at or above retirement age.

For the younger group, any transitions are likely to be out of the system, but for those who remain the most common movements are into the Carer class or the Non IS Family class. Transitions to the Carer class are likely a reflection of the person being cared for becoming reliant on constant care and hence the recipient meeting eligibility criteria for income support. The previous class of the recipient was also a strong predictor; some people may be acting as a carer throughout but transitioning in and out of income support according to fluctuating employment circumstances, while others may only be temporary carers and exit the welfare system once their role as a carer ends. Carers becoming or remaining single were more likely to move out of this class. People with at least one child care recipient were more likely to move to an income support class (as opposed to those who only had adult care recipients, who were more likely to remain off income support or exit the welfare system altogether).

The older recipients generally remain in this class, leave the welfare system, or move to the age pension on retirement. The most significant variables in the model are those relating to the partnership status of the

recipient and whether have received other general supplements. Again, single people were more likely to move out of this class, whereas those who had received other supplements were (not surprisingly) less likely to leave the welfare system.

Payment utilisation and size assumptions

The carer allowance and supplement comprise around half the annual cost, with FTB (35% of cost) and family payments (10% of cost) comprising the majority of the remainder. The utilisation rates for FTB and family payments by age reflect the typical ages during which people have children.

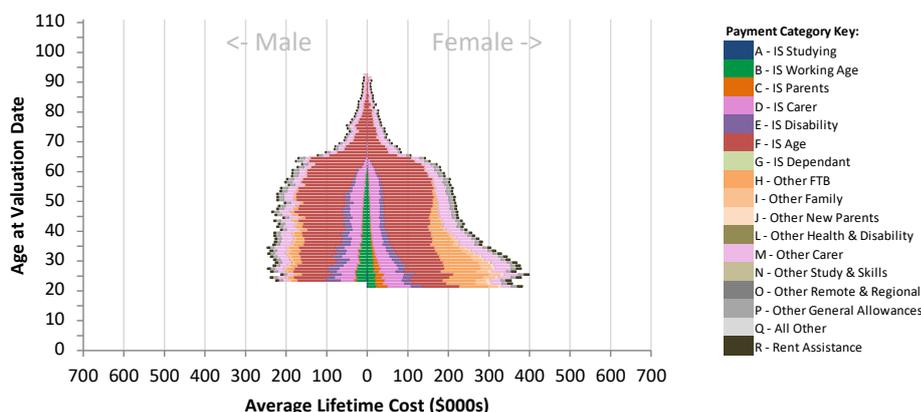
The average sizes by age generally increase through to age 40, then decrease for older ages. The shape of the average sizes by age may be related to the number of people typically being cared for at different ages, which impacts payment rates.

What does the model show for current Non IS Carers?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$41bn** (or **0.9%** of the total lifetime cost). The average lifetime cost for people in this class is **\$206,000**. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 75: Average lifetime cost by age and gender (Class 8)



The costs differ between genders with around \$178,000 for men and \$212,000 for women. We can see that a major part of the difference is for younger women and arises from their increased propensity to receive FTB and family payments.

The general shape of this pyramid is similar to that for the previous class (non IS family) with significant reductions in average lifetime costs once people pass pension age, reflecting that these people are not currently in receipt of age pension.

At the younger ages there are a myriad of contributions to the assessed average lifetime cost from working age, disability support, carer and parenting income support payments. This may indicate that some people in this class are quite close to becoming income support recipients and have material likelihoods of transitioning to these classes in future.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$41bn is a decrease of \$1bn compared to the baseline valuation. This was driven by a decrease in the average cost (as opposed to a change in population in this class):

- The number of people in this class has remained relatively similar (0.8% higher) to the previous valuation, with exits from class being slightly higher than expected.
- The average cost has decreased by \$7,000 (3.1%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 42: Breakdown of change in average lifetime cost for Class 8 by payment category

	Total	Income Support		Non-Income Support	
		Non Age Pension	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$42bn				
Jun-16 Total Lifetime Cost	\$41bn				
Change in Total Lifetime Cost	-\$1bn (2.3%)				
Change due to Population	+0.8%				
Change due to Average Lifetime Cost	-\$7k (3.1%)	-\$3k	< \$1k	-\$2k	< \$1k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	-\$3k	< \$1k	-\$2k	< \$1k	< \$1k
- Impact of policy changes	-\$1k	< \$1k	< \$1k	-\$1k	< \$1k
- Impact of other changes	-\$3k	-\$2k	< \$1k	-\$1k	< \$1k

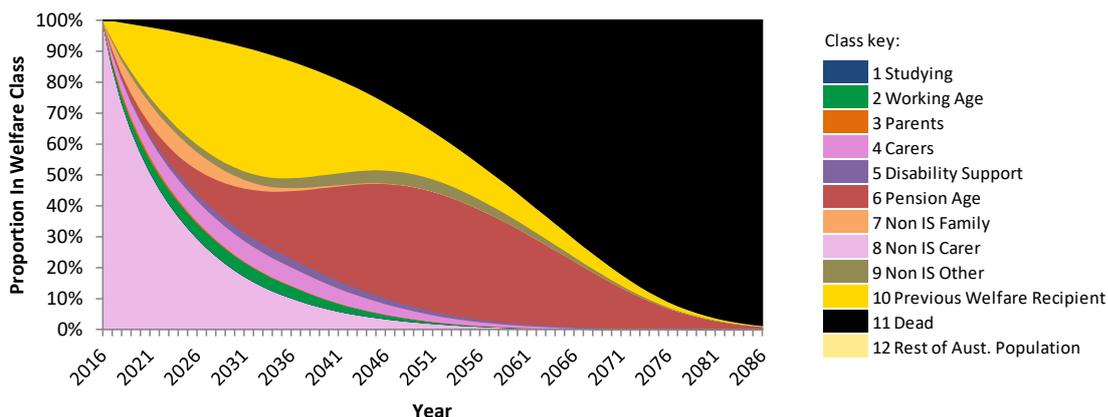
The reduction in average cost has been driven by:

- A small reduction in the projected future use of income support payments, as a result of a number of interrelated factors including:
 - Lower transition rates into disability support pension;
 - The inclusion of refined class movement models which has better differentiated people in class 8 as a lower persistency group and this has led to reductions in their likelihood of moving into income support classes at some point in the future, and
 - A reduction in the assumed long term unemployment rate, which reduces the likelihood of people utilising income support in their future lifetime.
- A decrease in the assumed proportion of people moving from this class into the Non IS Family class (and hence receiving family supplements), reflecting an observed downward trend in recent years.

Future outcomes

In developing the valuation results the projection model produces information on the expected transitions for people out of each class, as shown below.

Figure 76: Expected future trajectory for people in Class 8



We can see that:

- Around 70% of people exit the class over the next 10 years:
 - Around 40% of those currently present either die or exit the payment system
 - Approximately 15% of people move into a pre-retirement income support class with working age and carer being the most common.
 - A similar proportion either retire or move into the age pension and non IS family classes

It is interesting to note the distinct group who move from this class (which comprises people receiving carer allowance or carer supplement payments) into class 4 (which has those receiving carer payment).

Duration

The average future life expectancy for the Non IS Carers class is **39** years. This reflects that the age profile of this class is well distributed across most pre-retirement ages.

The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 43: Expected durations in welfare system for people currently in Class 8

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	4	10%
- Aged pension (class 6)	13	34%
Years with non-income support payments only	10	26%
Years not receiving any welfare payments	12	30%
Total	39	100%

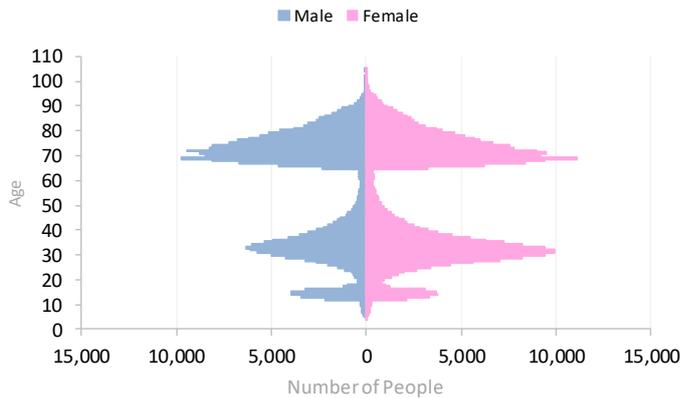
9.3 Non income support – Other

What does the data tell us about this class?

There were 543,327 people (6.8% of current welfare recipients) in the Non IS Other class in the 2016 model population.

The following chart shows a breakdown of the number of people in the Non IS Other class by age and gender.

Figure 77: 2016 profile of people in Class 9 – Non IS Other (age/gender)



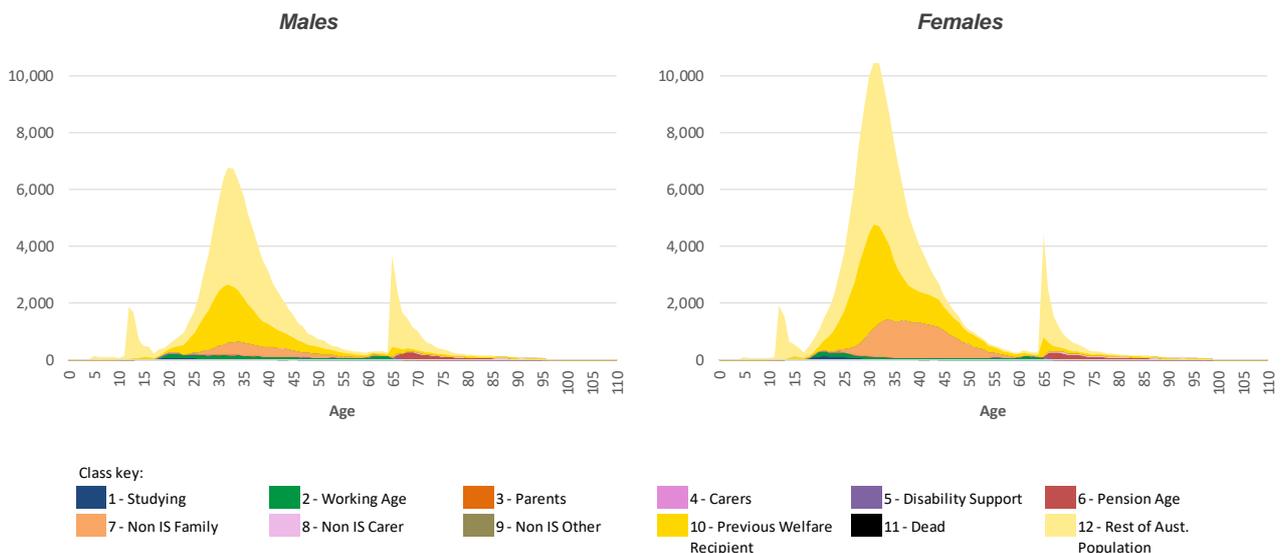
From the graph, we can see there are three distinct groups within the class:

- a group receiving payments such as school fees allowance or assistance to isolated children payments during their youth
- a group of parenting age who are predominantly female and are first year FTB, family or new parent payment recipients (and who subsequently move on to class 7), and
- a group of older people who are typically receiving energy supplements.

Movements into this class

Over the last 3 years, an average of 295,400 people (around 50% of the people in this class) per annum enter this class from another welfare class or from outside the welfare system. The following charts show the breakdown of this by age, gender and previous class.

Figure 78: Number of people entering Class 9 – Non IS Other (annual average over last 3 years)

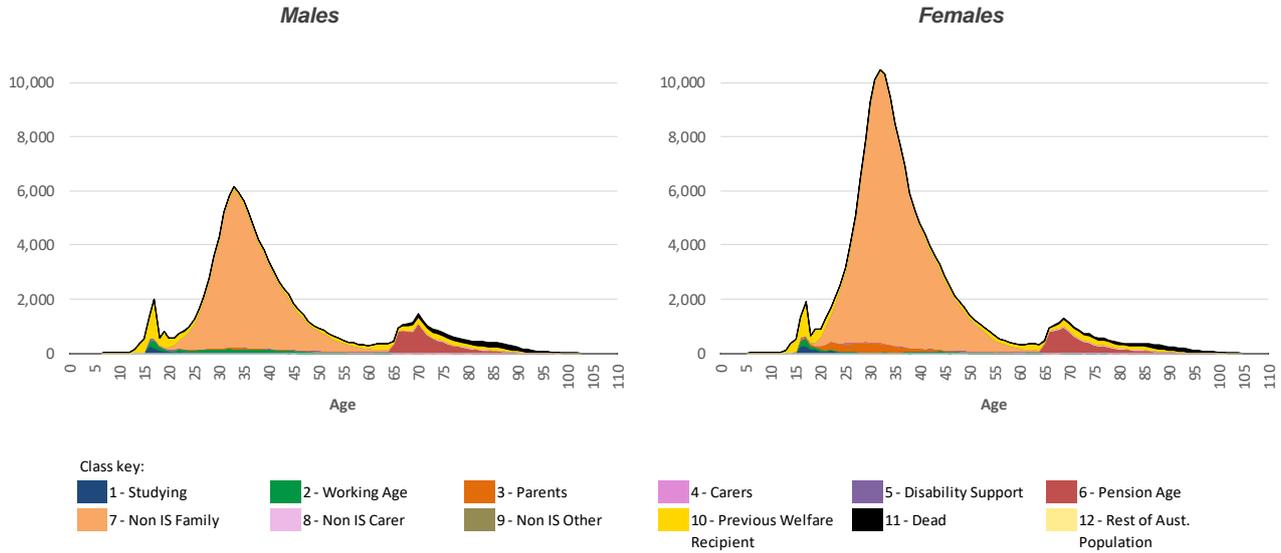


We can see that most people in this class primarily came directly from outside the welfare system, around half of which have never received any welfare payments before. The people who enter this class from other active classes typically do so from the Non IS Family class.

Movements out of this class

Over the last 3 years, an average of 300,100 people (50%) per annum have transitioned out of the Non IS Other class. The following charts show the breakdown of this by age, gender and destination class.

Figure 79: Number of people leaving Class 9 – Non IS Other (annual average over last 3 years)



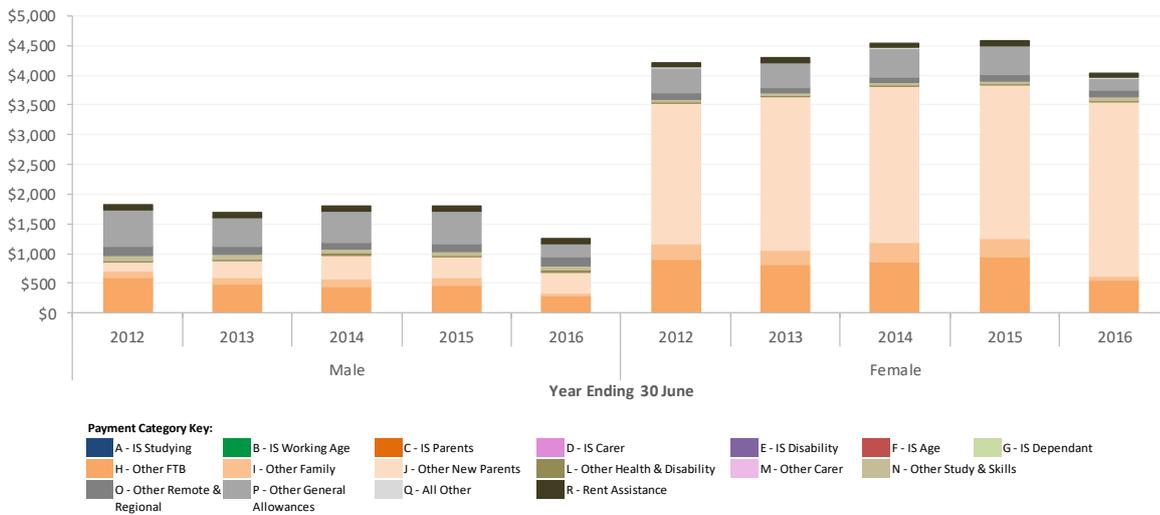
The mobility of this class varies significantly with age:

- The younger group are somewhat mobile, and when they exit this class they tend to exit the system or move onto Studying or Working age payments;
- The parenting group are highly mobile and tend to move into the Non IS family class a year after entering this class; and
- The older group typically stay, move into the age pension group or exit.

Payments received

During 2015/16, people in this class received a total of \$1.5 billion. This is 1.4% of the total payments made in 2015/16. The charts below show the average amount paid in a year to each person in this class.

Figure 80: Average payments per person in Class 9 – Non IS Other (restated to 2015/16 \$ values)

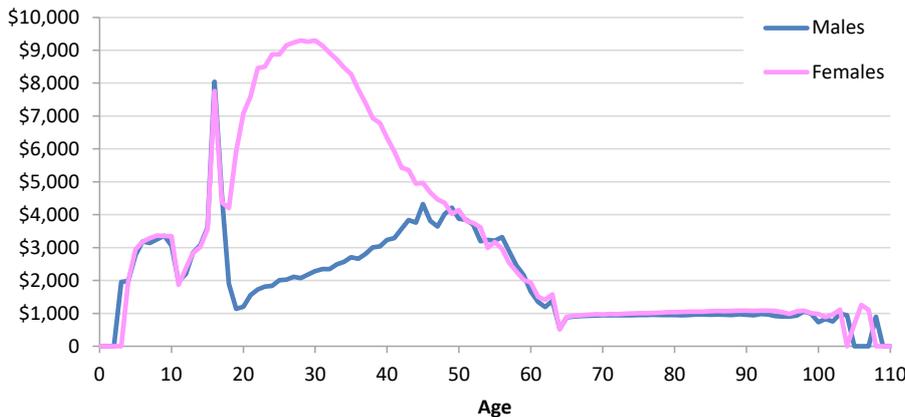


As for classes 3 'Parents', 7 'Non IS Family' and 8 'Non IS Carer', it is worth noting that the average payment for 2015/16 is somewhat understated. It will not fully reflect all FTB and family payments as these can be received as part of an income tax assessment post 30 June.

The average payment made in 2014/15 (noting the understating of 2015/16) was \$3,300 with a notable contribution from new parents payments, as people typically enter this class when they first have children. There are higher average payments being made to women (\$4,600) than men (\$1,800) as a result of women being more likely to be claiming new parents payments, FTB and other family payments. Note this is a much lower average annual payment than for the income support classes and is the lowest of all classes.

The average payments per person varies substantially depending on which of the sub-groups the recipient is in. This is illustrated in the chart below which shows the average payments per person in 2014/15 by age and gender.

Figure 81: 2014/15 payments to people in Class 9 – Non IS Other – by age and gender



We can see that the highest annual payments are going to the female parenting age group who are receiving FTB and other payments, whereas the people over 65 are receiving much smaller payments.

What have we taken into account in fitting assumptions?

The key assumptions in this class are the class movement assumptions and, to a lesser extent, payment utilisation assumptions. These differ based on a wide range of characteristics due to the diverse demographic mix of people in this class. Firstly, with changes to FTB A and FTB B, movements into Non-IS Other varies slightly from year to year as an interim class for FTB recipients. Secondly, the introduction of various allowances, including the Energy Supplement, has made the demographic mix in this class different from year to year. As such, we have developed risk based models for class movements and some payment utilisation

assumptions, while we have used foundation assumptions based on age and gender for payment size assumptions.

Class movement assumptions

In practice many of the class movements are governed by the model structure with people who receive an FTB, family or parental payment in one year moving into class 7 (Non IS Family) in the next year, unless they also receive an income support payment in that year. The lagged definition of class 7 means that people only enter that class in their second year of receiving any of these family payment types, so new parents enter via class 9. For the people aged between 20 and 65, almost everyone enters the class for a single year before moving onto class 7. Those at highest risk of transitioning onto income support were people born overseas, single parents, and those who entered the welfare system at a young age (less than 20 years old).

For the very youngest people in the class, the person's age, utilisation of studying supplements, and previous welfare class were significant in determining whether they would stay in the class, exit or move to the Studying or Working Age classes.

We have assumed that existing old-age recipients of Energy Supplement will most likely stay, with regular but slow movement into the Age Pension.

Class movement assumptions have been set with reference to the latest two to three years of experience, which have been relatively stable after retrospectively adjusting for policy changes.

Payment utilisation and size assumptions

For the payment utilisation assumptions, almost 70% of people currently receive other general allowances, and in particular the energy supplement. A number of people also receive FTB, other family and new parent payments; these people will mostly move to class 7 in the next year. There is greater variability in the utilisation assumptions in this class compared to other classes, due to the diverse demographics of people and various policy changes, for instance a large proportion of the very youngest people in the class receive study supplements. Assumptions have been selected after considering these various changes. At this valuation, we have developed risk models for the utilisation of FTB, other family and new parent payments. These models consider factors such as age and number of children, age of youngest child and partner status all of which relate to criteria impacting eligibility for these payments.

New parent payments comprise over half the annual cost, with FTB the second largest payment category (around 25% of cost). Other family, general allowances, remote and regional payments and rent assistance are the largest of the remaining payment categories.

The utilisation by age of new parents payments by reflects the typical ages when families have children. The high new parent utilisation for this class arises from the class definitions whereby people who first receive welfare payments on having a newborn child enter the system via this class.

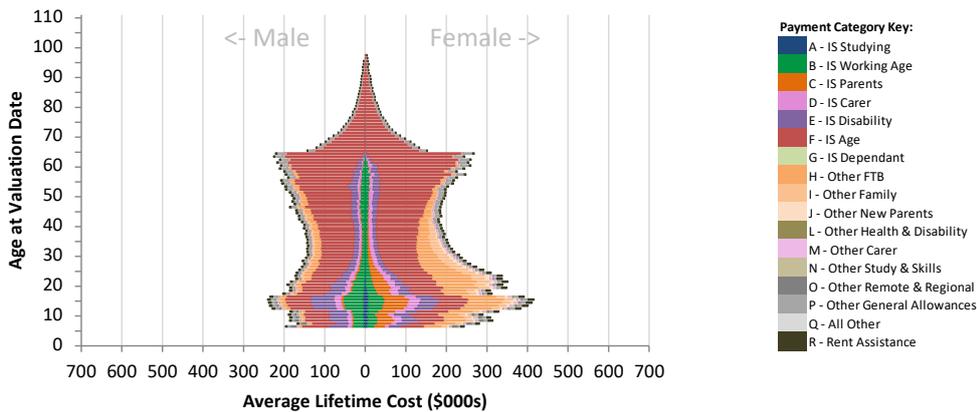
For the payment models we retained the foundation assumptions.

What does the model show for current people in the Non IS other class?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$74bn** (or **1.6%** of the total lifetime cost). The average lifetime cost for people in this class is **\$137,000**. This is the lowest of all classes. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 82: Average lifetime cost by age and gender (Class 9)



This pyramid extends through the full range of ages reflecting the broad mix of people in the class. Returning to the three groups we identified above:

- The older group have relatively low average lifetime costs and these typically reflect their chance of moving onto the age pension payment at some point in the future.
- For the people in the 20 to 65 age bracket the average lifetime cost is dominated by the FTB, family and age pension payments and is similar to that seen for the non IS family class. In this age range these two non IS classes contain people with a very similar mix of characteristics and so the cost similarity is unsurprising.
- For the group below age 20 the family payment categories make a lower contribution to the cost but there are larger elements from the income support payment types. This group have a greater chance of moving into these payments as they grow older than the other people in the class (who, by definition, are not currently getting any income support payments).

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$74bn is a decrease of \$13bn compared to the baseline valuation. This was mainly driven by a decrease in the average cost:

- The number of people in this class has decreased by 3.2% since the previous valuation. This is mainly driven by a reduction in the number of people above retirement age who were receiving supplementary payments only.
- The average cost has decreased by \$19,000 (12.0%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 44: Breakdown of change in average lifetime cost for Class 9 by payment category

	Total	Income Support		Non-Income Support	
		Non Age Pension	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$87bn				
Jun-16 Total Lifetime Cost	\$74bn				
Change in Total Lifetime Cost	-\$13bn (14.8%)				
Change due to Population	-3.2%				
Change due to Average Lifetime Cost	-\$19k (12.0%)	-\$9k	-\$4k	-\$3k	-\$2k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	-\$4k	-\$3k	< \$1k	< \$1k	< \$1k
- Impact of policy changes	-\$1k	< \$1k	< \$1k	-\$1k	< \$1k
- Impact of other changes	-\$13k	-\$7k	-\$3k	-\$2k	-\$1k

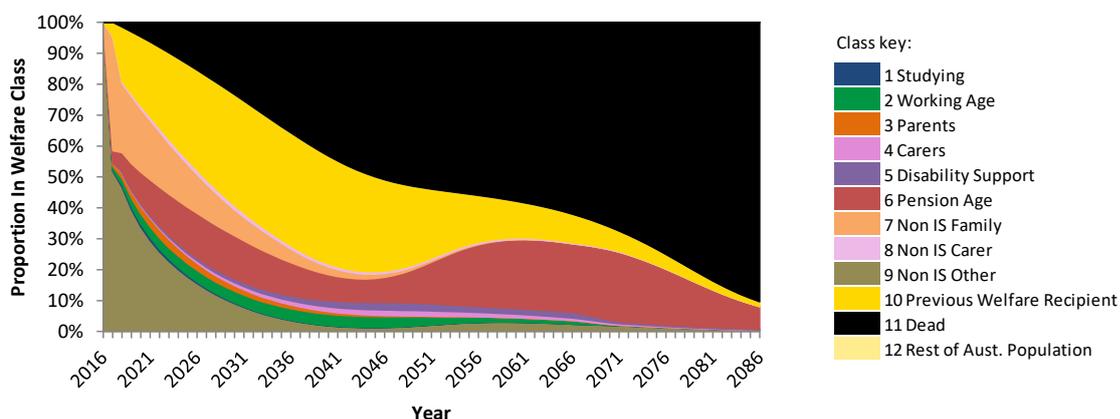
The reduction in average cost has been primarily driven by lower re-entries into income support from previous welfare recipients, lower entries into the disability support pension, and a lower long term unemployment rate.

These are similar to those for the Non IS Family class (discussed in section 9.1) given that most people in Non IS Other who are below age pension age are expected to transition into Non IS Family in a short period of time.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below. This is a change from the trajectory presented in the baseline report and this reflects the difference mix of people now in this class.

Figure 83: Expected future trajectory for people in Class 9



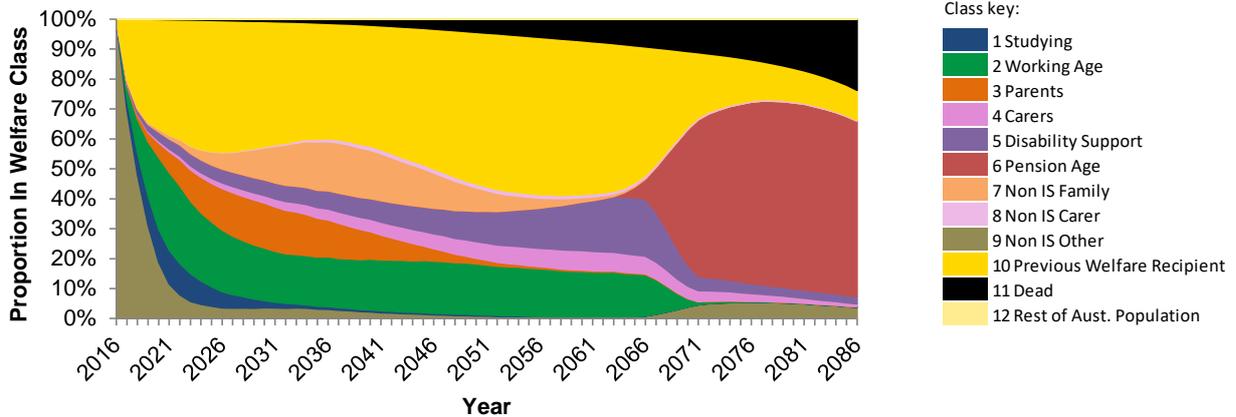
The trajectory results support the previous observations, showing that:

- Over the next 5 years:
 - Around 30% of the people will stay in the class
 - There is a distinct group (around 10%) who move quickly into the age pension, as expected for some of the older people in the class
 - Around 25% of the class exit the payment system
 - A group of 20% will move into class 7 (presumably the new parents).
- Around 10% of the people in the class are expected to move onto some form of pre-retirement income support over the next 5-10 years.

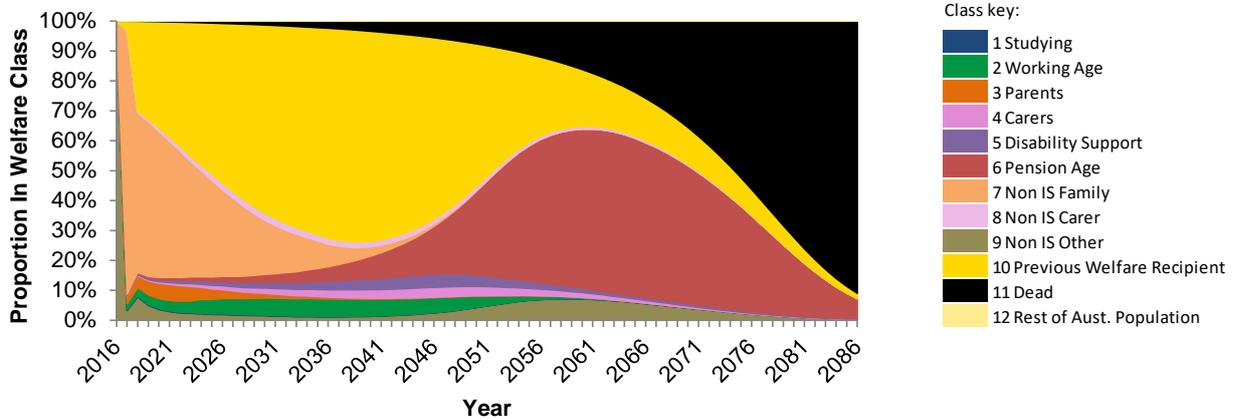
These results are reflective of the distinctive sub groups within this class each of whom would be expected to have very different future life trajectories. We have illustrated this below by showing the trajectories for people within the different age bands.

Figure 84: Expected future trajectory for people in Class 9 – by age band

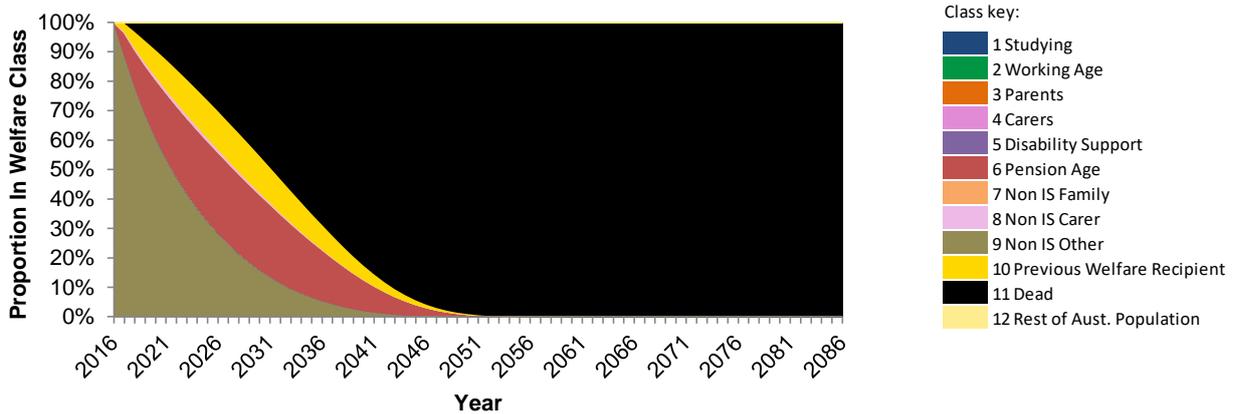
Age 1-19



Age 20-64



Age 65+



Duration

The average future life expectancy for the Non IS Other class is **36** years. The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 45: Expected durations in welfare system for people currently in Class 9

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:	4	10%

Results for non-income support recipients

	Expected Years	Proportion of Future Lifetime
- Not aged pension (classes 1-5)	11	29%
- Aged pension (class 6)		
Years with non-income support payments only	8	23%
Years not receiving any welfare payments	14	38%
Total	36	100%

10 Results for non-welfare recipients

Every person within the population has some chance of accessing the welfare system during their lifetime, hence everyone has a non-zero average lifetime cost. In this section we discuss the lifetime costs for people who are not current welfare recipients (i.e. those in classes 10 and 12). There are 16.1 million people in the model who are non-welfare recipients and this group makes up 67% of the total model population and includes 54% of the lifetime cost.

10.1 Previous welfare recipients

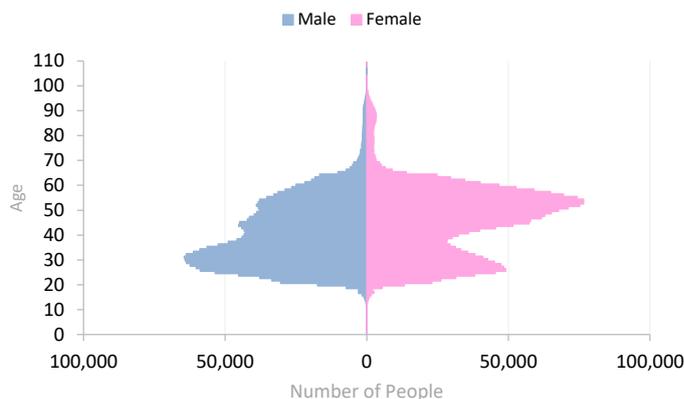
There are 4.2 million people who were in the past welfare recipients class at 30 June 2016. The profile of these by age and gender is illustrated below.

What does the data tell us about the previous welfare recipients class?

There were 4,186,597 people (26.0% of non-welfare recipients) in the previous welfare recipients class in the 2016 model population.

The following chart shows a breakdown of the number of people in this class by age and gender.

Figure 85: Profile of people in Class 10 – all people in class (age/gender)



We can see that there are more women in this class at older ages, most likely because women are more likely to have received FTB or family payments and have been in the large Non IS Family class. At younger ages there are more men than women.

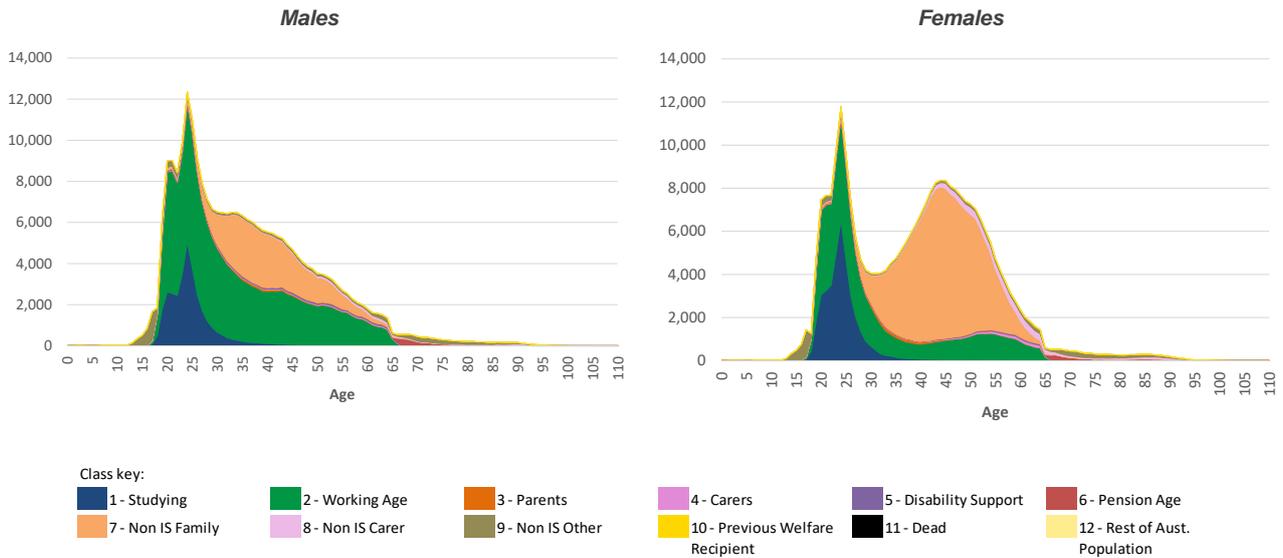
Some of the people have been in the previous welfare recipients class for only a short period; others have been there for longer, up to the maximum of the 14 years available from the data provided.

Going forward we will have people in the exits class who have been past welfare recipients but not been in the payment system for even longer periods. An example would be someone aged 40 who received a Studying payment when they were 20 and then exited the welfare system and has not received any subsequent payments. This is likely to increase the numbers in the class at older ages and gradually change the demographic mix of the class.

Movements into this class

Over the last 3 years, an average of 537,300 people (around 14% of the people in this class) per annum exit the current welfare recipient classes into this class. The following charts show the breakdown of this by age, gender and previous class.

Figure 86: Number of people entering Class 10 – Previous Welfare Recipient (annual average over last 3 years)

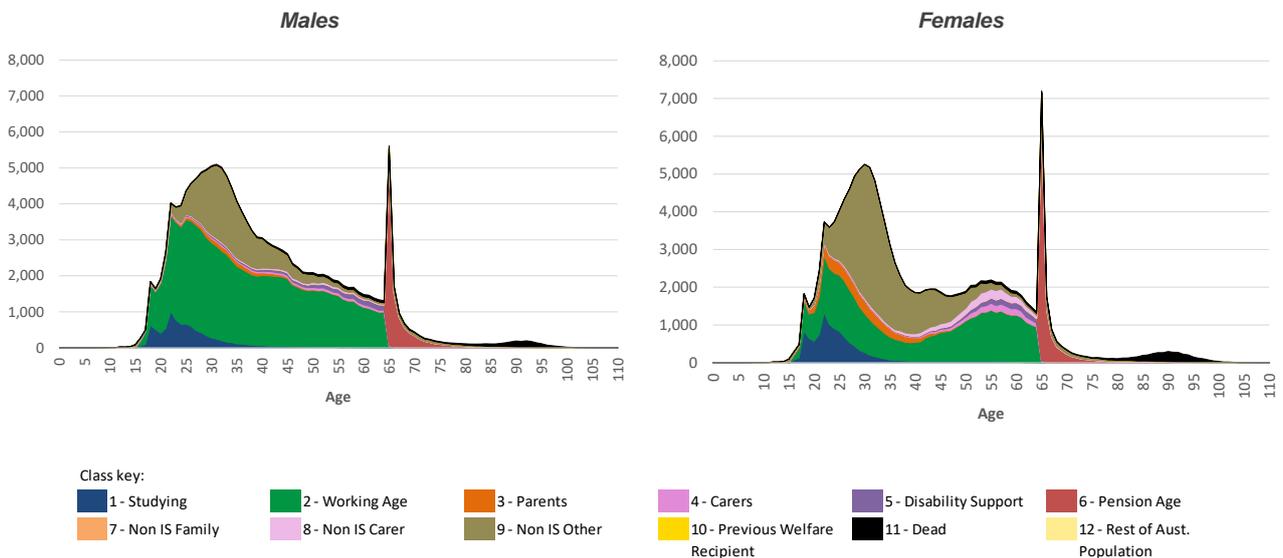


We can see that people usually exit the current welfare recipient classes into this class from class ‘1 Studying’, class ‘2 Working Age’ and class ‘7 Non IS Family’. People in other classes are more likely to either not exit the welfare system (other than through death), or to transition to another class prior to exiting.

Movements out of this class

Over the last 3 years, an average of 293,600 people (8%) per annum have moved out of this class. These are predominantly re-entries into the welfare system, although a small proportion of people die and move to class 11. The following charts show the breakdown of this by age, gender and destination class.

Figure 87: Number of people leaving Class 10 – Previous Welfare Recipient (annual average over last 3 years)



The main re-entries from this class are through movements into class ‘1 Studying’, ‘2 Working Age’, ‘6 Pension Age’ and ‘9 Non IS Other’ (most of those re-entering into class 9 subsequently transition to class ‘7 Non IS Family’).

Payments received

No payments are received while people in this class. Payments may be received by this group upon re-entry into an active welfare recipients and these are covered in sections 8 and 9.

What have we taken into account in fitting assumptions?

We have adopted class movement (new entrant) assumptions through consideration of the risk factors that influence the experience. There are no payment utilisation or size assumptions applicable whilst people are in this class as it only includes non welfare recipients.

Class movement assumptions

In setting the class movement assumptions we have observed a recent decrease in the proportion of individuals who re-enter from this class into the active welfare recipient classes. In particular we have seen decreases in entries into class '2 Working Age'.

For these assumptions, we have considered combination of factors, both those relating to the recipient (e.g. age, gender, education level, partnering status, number of dependent children, and age of youngest child) and those relating to how the recipient interacts with the system (e.g. when did they last receive a welfare payment, previous class).

Recent welfare history is particularly predictive and people who exited into class 10 recently are generally more likely to re-enter again than older exits. People are also relatively more likely to re-enter into a welfare class that they have previously utilised, rather than a different welfare class.

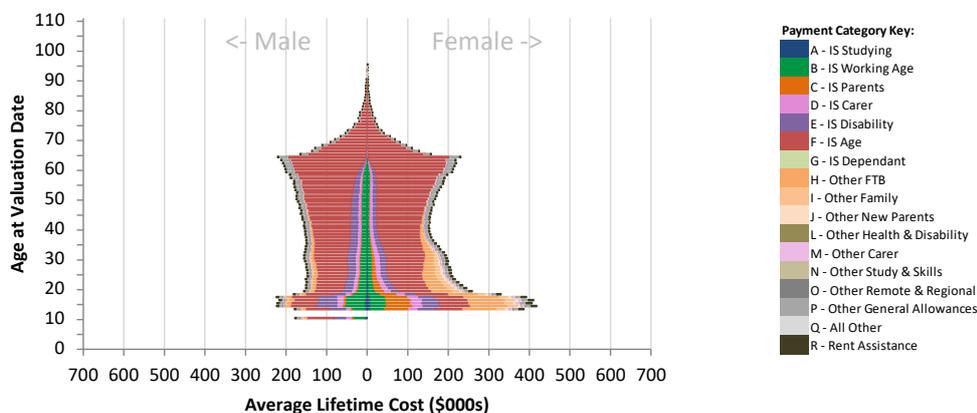
As would be expected, having a young child is very predictive of entering into an active welfare class. Highest level of education attained was also found to be predictive and those who have attained a level of education of Year 12 level or below are typically more likely to enter the active welfare classes.

What does the model show for people currently in this class?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$653bn** (or **14.5%** of the total lifetime cost). The average lifetime cost for people in this class is **\$156,000**. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 88: Average lifetime cost by age and gender (Class 10)



The most substantial part of this average lifetime cost for both genders is for the age pension although there are contributions from all payment categories.

For women up to around age 40 there are significant contributions from FTB. For people in their early forties and above, the differences between the costs for men and women are small (women have a slightly higher lifetime cost due to higher expected longevity).

The average lifetime cost pyramid shows a significant change at age 65 with much lower costs for older people:

- For people below age 65 - the age pension component of the average lifetime cost is significant as there is a high chance of the people moving onto the age pension as they reach pension age.

- For people above age 65 - to be above age 65 and be in this class they cannot be receiving age pension at present. This means they are far less likely to receive the age pension in future than a typical person in the population and hence have a lower average lifetime cost.

For people significantly above age 65 the average lifetime costs reduce year on year as the future lifetime is shorter and the chances of moving into the Age Pension class at a future point in time are even lower.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$653bn is a decrease of \$27bn compared to the baseline valuation. This was driven by a decrease in the average cost, partly offset by an increase in the number of people in this class:

- The number of people in this class has increased by 7.0% (from 3.9m to 4.2m) since the previous valuation. This increase is largely a result of having one year of extra history in our data which means there is a larger group of people we have been able to identify as being previous welfare recipients.
- The average cost has decreased by \$18,000 (10.3%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 46: Breakdown of change in average lifetime cost for Class 10 by payment category

	Total	Income Support		Non-Income Support	
		Non Age Pension	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$680bn				
Jun-16 Total Lifetime Cost	\$653bn				
Change in Total Lifetime Cost	-\$27bn (4.0%)				
Change due to Population	+7.0%				
Change due to Average Lifetime Cost	-\$18k (10.3%)	-\$12k	< \$1k	-\$3k	-\$3k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economics module	-\$7k	-\$4k	-\$2k	< \$1k	< \$1k
- Impact of policy changes	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of other changes	-\$11k	-\$8k	+\$2k	-\$2k	-\$2k

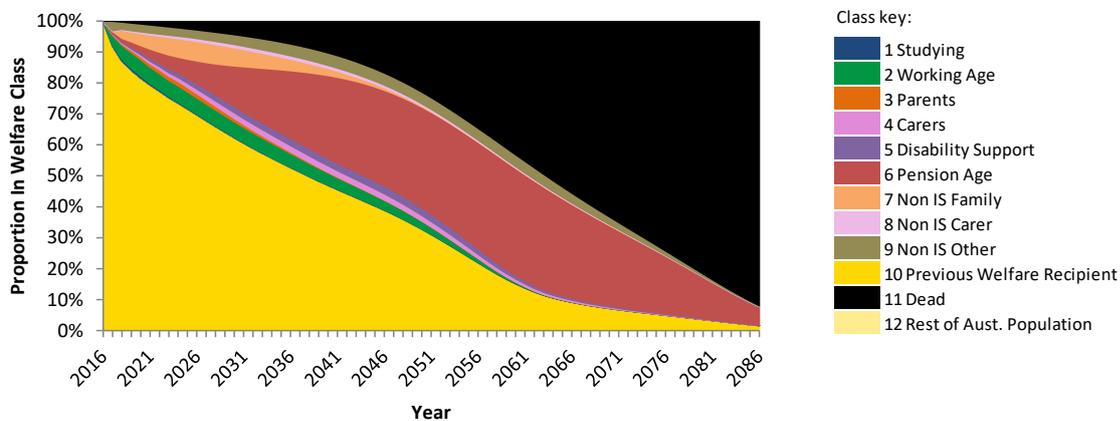
The reduction in average cost has been primarily driven by:

- A reduction in the assumed long term unemployment rate, which has a significant impact on the projected number of people entering into the Working Age class;
- Lower transition rates into working age (discussed above); and
- A flow on impact of the lower entry rate assumptions onto future transitions into other active classes.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 89: Expected future trajectory for people in Class 10



Some observations we can make based on our analysis are that:

- The pattern for this trajectory chart is different to most those of the active classes seen in sections 8 and 9. In particular a relatively high proportion are expected to still be in the current class in each future year.
- 25-30% of the people currently in class 10 are expected to be in an active class in 10 years' time. The highest entries are expected to be into '2 Working Age', '6 Age Pension' and '7 Non IS Family'.
- For most of this group, if they receive an income support payment in future it is most likely to be the age pension.

Duration

The average future life expectancy for the Previous Welfare Recipient class is **46** years. This reflects that the age profile of this class is well distributed across most pre-retirement ages.

The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 47: Expected durations in welfare system for people currently in Class 10

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	4	8%
- Aged pension (class 6)	15	33%
Years with non-income support payments only	4	8%
Years not receiving any welfare payments	24	52%
Total	46	100%

10.2 Rest of the Australian population

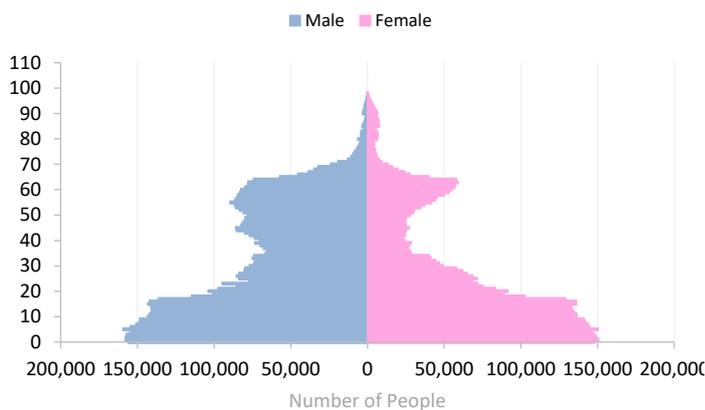
This group (class 12) is the remainder of the population, being the group of people who have not received any payments during the period covered by the data analysed – broadly the last 15 years. This group will include some people who were welfare recipients prior to that time alongside others who have never received a payment.

What does the data tell us about the previous welfare recipients class?

There were 11,929,432 people (74.0% of non-welfare recipients) in the rest of the Australian population class in the 2016 model population.

The following chart shows a breakdown of the number of people in this class by age and gender.

Figure 90: Profile of people in Class 12 – all people in class (age/gender)



There are more men in this class than women and this is likely because women are more likely to have received FTB or family payments and have been in the large Non IS Family class. If these groups subsequently exit they move into class 10 rather than return to class 12.

Movements into this class

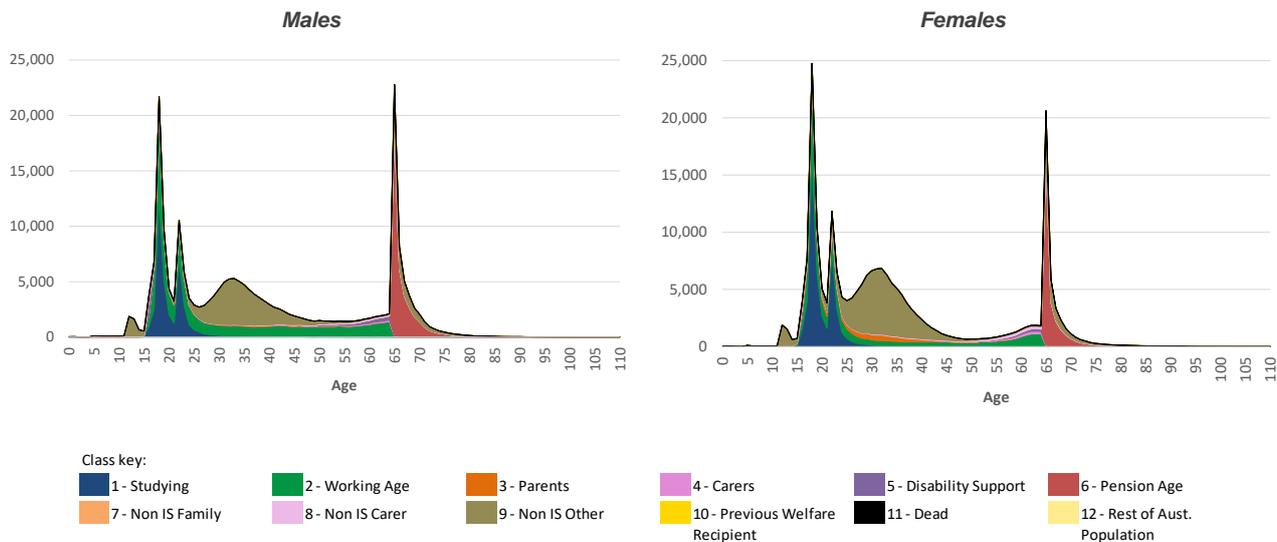
By definition there are no movements into this class. However it should be noted that the model population changes from valuation to valuation to reflect the profile of the Australian resident population after considering those people assigned to other classes and this impacts on the number of people in this class compared to last year.

As previously noted the model population includes all Australian residents at the valuation date and overseas welfare recipients who received a payment in the previous year. Between 30 June 2015 and 30 June 2016 we have estimated that there were around 300,000 births and a net migration into Australia of around 150,000. The majority of these groups have entered the model population as additional people in class 12.

Movements out of this class

Over the last 3 years, an average of 458,300 people (around 4%) per annum have moved out of this class. These are predominantly entries into the welfare system, although a very small proportion of people die and move to class 11. The following charts show the breakdown of this by age, gender and destination class.

Figure 91: Number of people leaving Class 12 – Rest of Australian population (annual average over last 3 years)



The main re-entries from this class are through movements into class ‘1 Studying’, ‘2 Working Age’, ‘6 Pension Age’ and ‘9 Non IS Other’ (most of those re-entering into class 9 subsequently transition to class ‘7 Non IS Family’).

Payments received

No payments are received while people in this class. Payments may be received by this group upon entry into an active welfare recipients and these are covered in sections 8 and 9.

What have we taken into account in fitting assumptions?

We have adopted class movement (new entrant) assumptions through consideration of the risk factors that influence the experience. There are no payment utilisation or size assumptions applicable whilst people are in this class as it only includes non welfare recipients.

Class movement assumptions

In setting the class movement assumptions we have observed a recent decrease in the proportion of individuals who re-enter from this class into the active welfare recipient classes. In particular we have seen decreases in entries into class ‘2 IS Working Age’.

For these assumptions we have considered factors relating to the individual (e.g. age, gender, education level, partnering status, number of dependent children, and age of youngest child). There is no information on interaction with the welfare system for this group as they have not previously received welfare (at least during the history for which we have data).

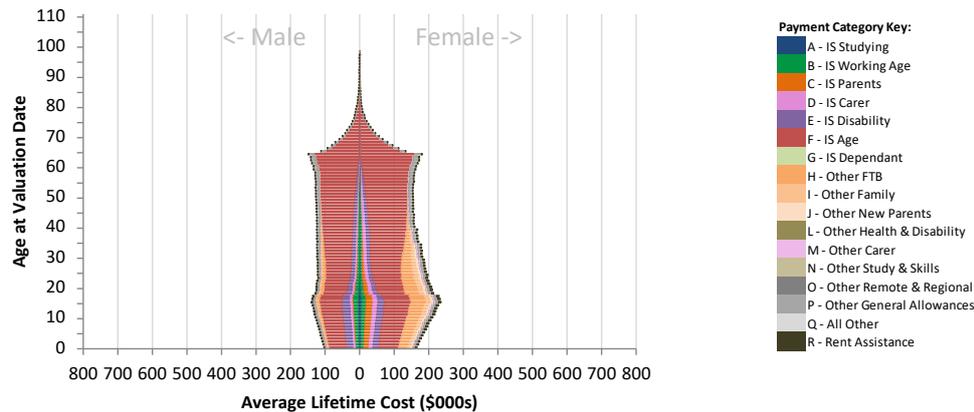
As would be expected, having a young child is very predictive of entering into an active welfare class. Highest level of education attained was also found to be predictive and those who have attained a level of education of Year 12 level or below are typically more likely to enter the active welfare classes.

What does the model show for people currently in this class?

Lifetime costs

We estimated the lifetime cost for the people in this class to be **\$1,767bn** (or **39.1%** of the total lifetime cost). The average lifetime cost for people in this class is **\$148,000**. The variation in average lifetime cost by age and gender is illustrated in the figure below.

Figure 92: Average lifetime cost by age and gender (Class 12)



The most substantial part of this average lifetime cost for both genders is for the age pension although there are contributions from all payment categories.

For women up to around age 40 there are significant contributions from FTB and parenting payments. For people in their early forties and above, the differences between the costs for men and women are small (women have a slightly higher lifetime cost due to higher expected longevity).

The average lifetime cost pyramid shows a significant change at age 65 with much lower costs for older people:

- For people below age 65 - the age pension component of the average lifetime cost is significant as there is a high chance of the people moving onto the age pension as they reach pension age.
- For people above age 65 - to be above age 65 and still be in this class they cannot be receiving age pension at present. This means they are far less likely to receive the age pension in future than a typical person in the population and hence have a lower average lifetime cost.

For people significantly above age 65 the average lifetime costs reduce year on year as the future lifetime is shorter and the chances of moving into the Age Pension class at a future point in time are even lower.

Change in lifetime costs since the baseline valuation

The lifetime cost for the people in this class of \$1,766bn is a decrease of \$196bn compared to the baseline valuation. This was mainly driven by a decrease in the average cost, although the number of people in this class also decreased slightly:

- The number of people in this class has decreased slightly by 0.2% since the previous valuation. This is the net impact of births, migration, deaths, and entries into the welfare system over the past year.

Although the overall population is growing we would not necessarily expect an increase in the numbers in this class as the longer time period covered by the data means we are now able to identify a greater proportion of previous welfare recipients and assign these people to class 10.

- The average cost has decreased by \$16,000 (9.8%) since the previous valuation. The following table provides a breakdown of the change in average lifetime cost by payment category.

Table 48: Breakdown of change in average lifetime cost for Class 12 by payment category

	Total	Income	Support	Non-Income	Support
		Non Age Pension	Age Pension	Family Supplements	Other Supplements
Jun-15 Total Lifetime Cost	\$1,961bn				
Jun-16 Total Lifetime Cost	\$1,766bn				
Change in Total Lifetime Cost	-\$196bn (10.0%)				
Change due to Population	-0.2%				
Change due to Average Lifetime Cost	-\$16k (9.8%)	-\$12k	-\$2k	< \$1k	-\$2k
- Impact of change in inflation	< \$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of new economic module	-\$7k	-\$4k	-\$2k	< \$1k	< \$1k
- Impact of policy changes	-\$1k	< \$1k	< \$1k	< \$1k	< \$1k
- Impact of other changes	-\$8k	-\$7k	< \$1k	< \$1k	-\$2k

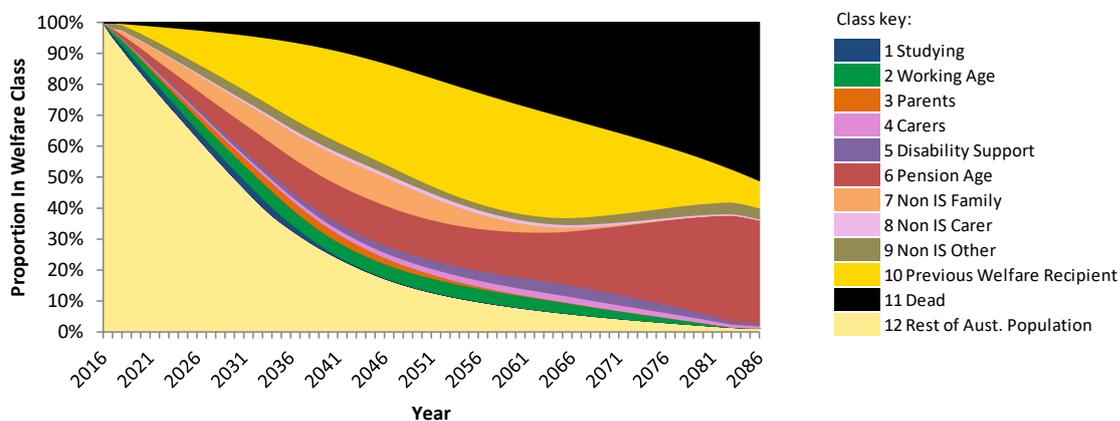
The reduction in average cost has been primarily driven by:

- Lower transition rates into working age as a result of both:
 - Reductions to the adopted entry rates into working age; and
 - The reduction in the assumed long term unemployment rate;
- A flow on impact of the lower entry rate assumptions onto future transitions into other active classes. This has reduced the assessed likelihood of people entering other income support payment classes in future and resulted in lesser contributions to the lifetime cost from future Carer and DSP payments.

Future outcomes

In developing the valuation results the projection model also produces information on the expected transitions for people out of each class, as shown below.

Figure 93: Expected future trajectory for people in Class 12



Some observations we can make based on our analysis are that:

- The main difference between the trajectories for this group compared to that shown for the previous welfare recipients is likely driven by the difference in the age profiles. In particular class 12 contains a higher number of younger people and so the use of each different welfare classes is typically further into the projection.
- 15% of the people currently in class 10 are expected to be in an active class in 5 years' time. The highest entries are expected to be into classes '2 Working Age', '6 Age Pension', '7 Non IS Family' and '9 Non IS Other'. 4% of people are expected to have entered an active class and then exited into class 10 by this point.

- Around 24% of this group are expected to be receiving an income support payment in 2056, with the majority projected to be in class '6 Pension Age'.

Duration

The average future life expectancy for the Rest of Australian Population class is **63** years. This reflects that there are a large proportion of young people in this class.

The table below provides a summary of the expected welfare system use of people currently in this class over this time. This has been developed by considering which classes people move into as they move through the welfare system over their lives.

Table 49: Expected durations in welfare system for people currently in Class 12

	Expected Years	Proportion of Future Lifetime
Years with some income support payments:		
- Not aged pension (classes 1-5)	6	10%
- Aged pension (class 6)	16	25%
Years with non-income support payments only	6	9%
Years not receiving any welfare payments	35	56%
Total	63	100%

11 Dynamics of the system

11.1 Introduction

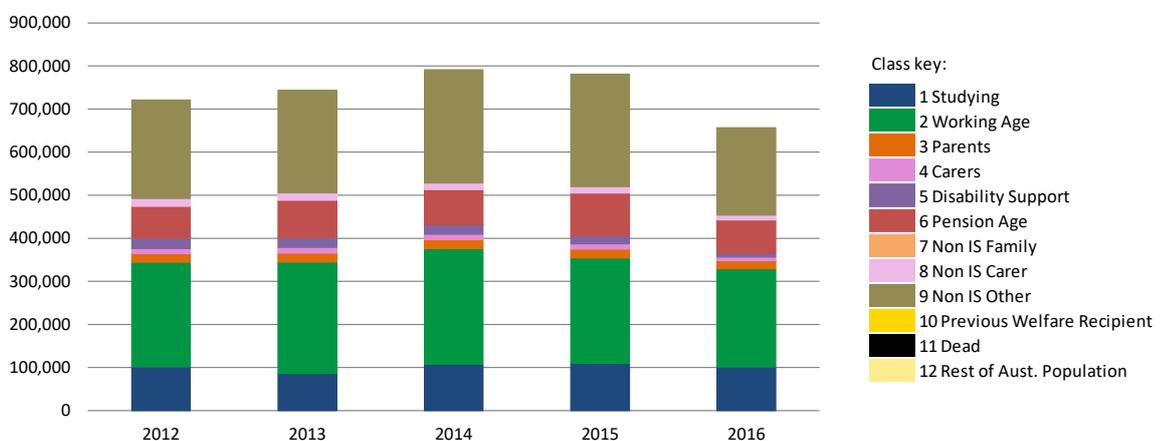
As well as considering individual class movements, it is also informative to examine the dynamics of how people move into, through and out of the system overall. Building on the previous sections which cover these movements in some detail at an individual class level, this section discusses overall movements at a system level.

11.2 New entrants

Historical entrants and re-entrants

The total number of recent new entrants and re-entrants has been between 720,000 and 790,000 each year from 2012 to 2015 and was 660,000 for 2016. A breakdown of these new entrants by class is shown below.

Figure 94: History of entrants and re-entrants, by class entered, for year ending 30 June



We can see that:

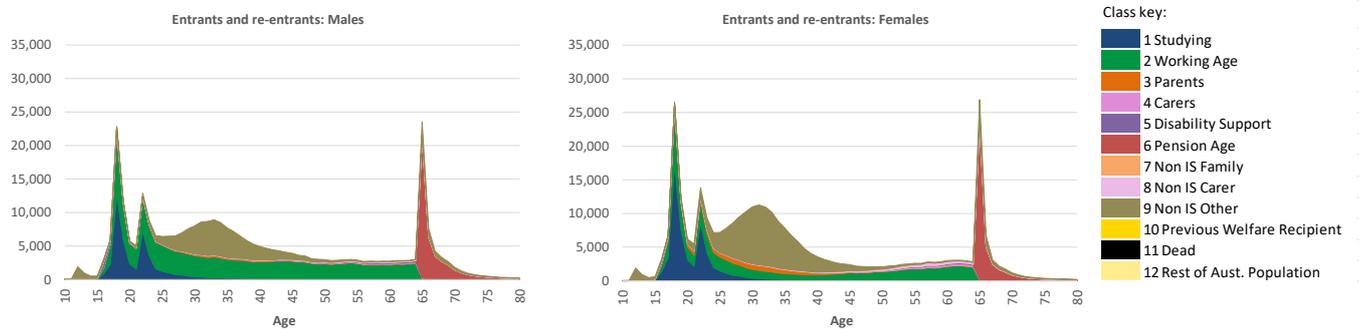
- The classes with the most new entrants are classes 9 'Non IS Other', 2 'Working Age', 1 'Studying' and 6 'Pension Age'.
- The numbers of new entrants increased over the years ending 30 June 2012 to 2014 and then reduced a little during the year to 30 June 2015. This was despite of an increase to age pension new entrant numbers in that year
- Entrants and re-entrants for the year ending 30 June 2016 were lower than for other recent years. It should be noted that entries in 2015/16 are likely understated due to the data maturity issue discussed in section 3.1. We have made an explicit allowance for this by adding in 80,000 additional people (see Figure 98 below). However even allowing for this the entries in 2015/16 are lower than they were for the previous two years.

The numbers of new entrants into class 9 for the 2015 year have reduced by comparison to those shown in the baseline valuation report. This is the result of refining the treatment of some small supplements in the data which had previously resulted in a group of people over retirement age being seen to exit class 9 in 2012 and then re-enter it in 2015. This data artefact confused the underlying experience and the refined treatment has removed it.

Profile of entrants and re-entrants

The charts below show the profile of entrants and re-entrants in 2015/16.

Figure 95: 2015/16 combined profile of entrants and re-entrants, by age, gender and class entered



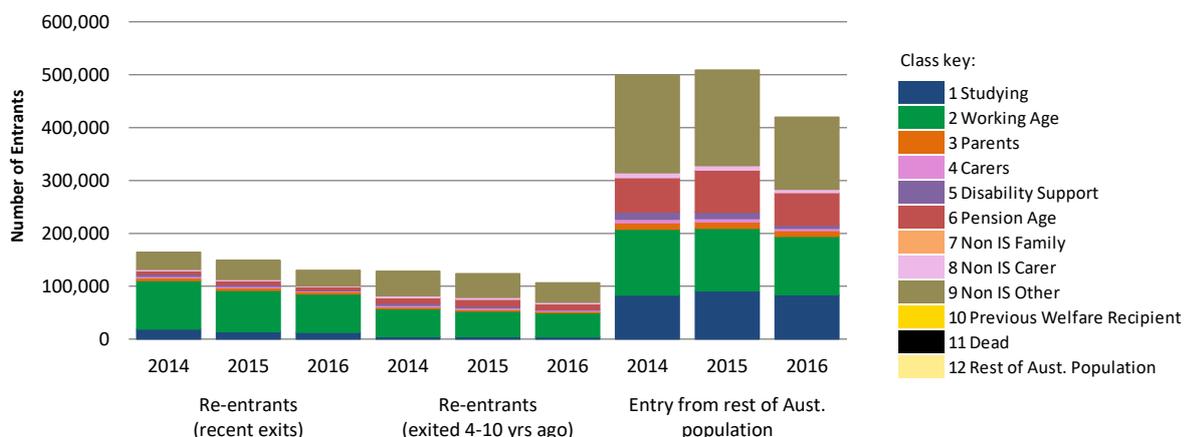
We can see that:

- The total numbers of male and female entrants were similar in 2015/16, with around 330,000 of each.
- For people below pension age the entries are dominated by 1 'Studying', 2 'Working Age' and 9 'Non IS Other'.
 - Entries into Non IS Other largely relate to people using FTB for the first time. These people will transition into class '7 Non IS Family' if they continue to utilise FTB in the following year. The reason these people enter into class '9 Non IS Other' rather than class '7 Non IS Family' is because of the timing lag on the definition of people in class 7, as explained in section 3.4.
- At later ages, entries are dominated by '6 Pension Age'.
- At earlier ages, more men have entered into '2 Working Age', whereas relatively more women have entered into '3 Parenting', '1 Studying' and '9 Non IS Other'.

Experience of new entrants compared to re-entrants

We have set out below the breakdown of entrants between re-entrants, for people who exited the welfare system before and after 3 years ago, and new entrants from the rest of the population.

Figure 96: Breakdown of recent entrants and re-entrants, by class entered and period since exit, for year ending 30 June



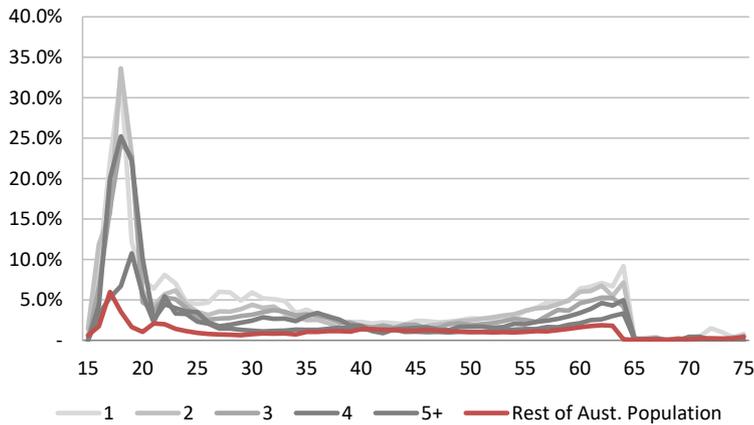
We can see that:

- A reasonably high number of re-entrants come from the relatively small group of people who exited the system between 1 and 3 years ago. Our analysis, as further discussed below, shows that recent welfare history is likely to be predictive of re-entering.

- A significant proportion of the re-entrants return to the Working Age class.
- The rest of the Australian population group are relatively more likely to enter into class ‘1 Studying’, class ‘6 Pension Age’ or class ‘9 Non IS Other’.

The chart below shows an illustration of some of these numbers as rates. This chart shows the rate of women entering or re-entering from both the recent welfare recipient and the rest of the Australian population classes into the Working Age class between June 2015 and June 2016.

Figure 97: Illustration of rates of females entering from the rest of the Australian population and previous welfare recipients classes to the Working Age class between June 2015 and June 2016



Notes:

- Re-entry rates from previous welfare recipients (class 10) are shown in grey and split by number of years since last utilised welfare.
- Entry rates from the rest of the Australian population (class 12) are shown in red

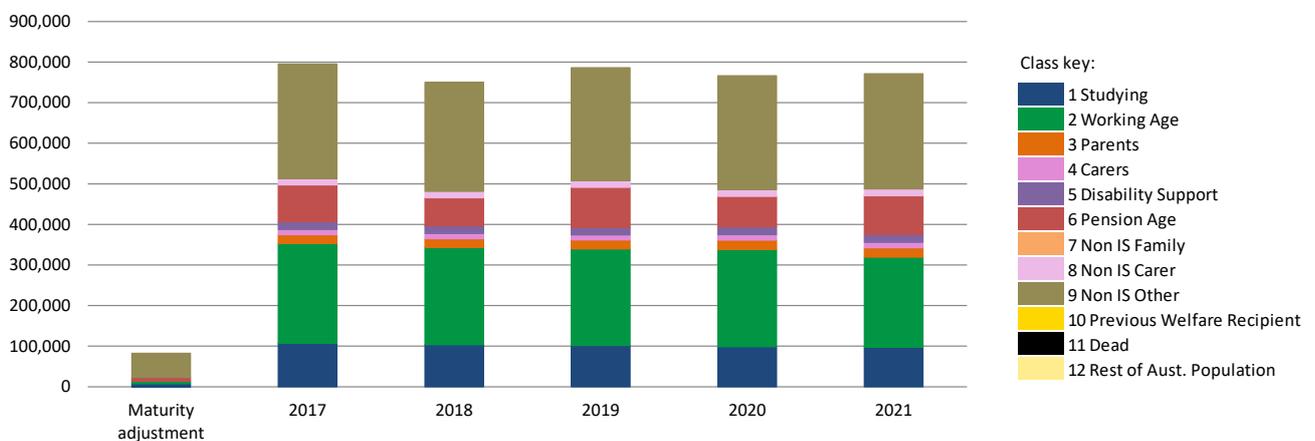
We can see that the probability of entering into the Working Age class is generally lower for first time entries from the rest of the Australian population class, than it is for re-entries from the exits class. The probability of people re-entering is generally higher for someone who has recently utilised welfare, and as such the re-entry rates for people who have only been inactive for one year are the highest and the probability of re-entering decreases the longer people are inactive.

What is the expected new entrant experience?

The expected numbers of new entrants and re-entrants over the next 5 years are shown in the chart below.

We have also illustrated the quantum of the maturity adjustment which has been made to mitigate the effect of the underreporting of new entrants in the latest year on the overall assessment of the lifetime cost. This is a one-off adjustment which is applied in 2017, the first year of the projection.

Figure 98: Expected number of entrants and re-entrants, by year of future entry and destination class



As can be seen:

- The maturity adjustment allows for an additional 80,000 new entrants, with the majority of these being to class 9.
- The total number of entrants and re-entrants is expected to be around 800,000 in 2016/17. This is broadly consistent with the numbers of new entrants seen in 2014 and 2015.
- There are some variations from year to year in the expected number of entrants and this links to:
 - The shape of the population.
 - Changes to the numbers of age pension entrants owing to the staged changes in pension age from 65 to 67 which impact people retiring over the period 2017 to 2023.
 - A gradual decrease of entries into ‘2 Working Age’ as a result of the impact of the assumed future reductions in the unemployment rate reducing future entrants into the Working Age class.

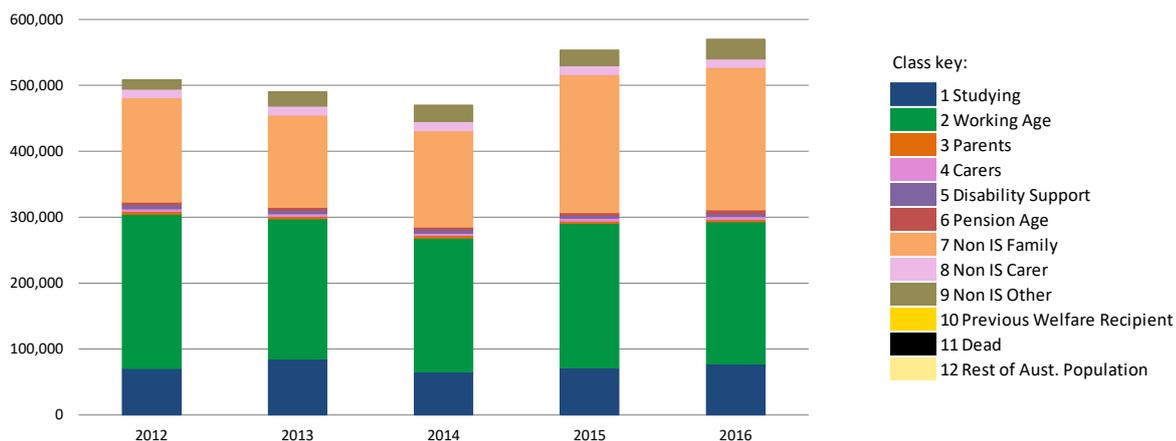
11.3 Exits from the system

This section examines the exits from the system as a whole.

Historical exits

The figure below provides a summary of the overall exits from the active welfare classes.

Figure 99: Number of exits, by year of exit and previous class



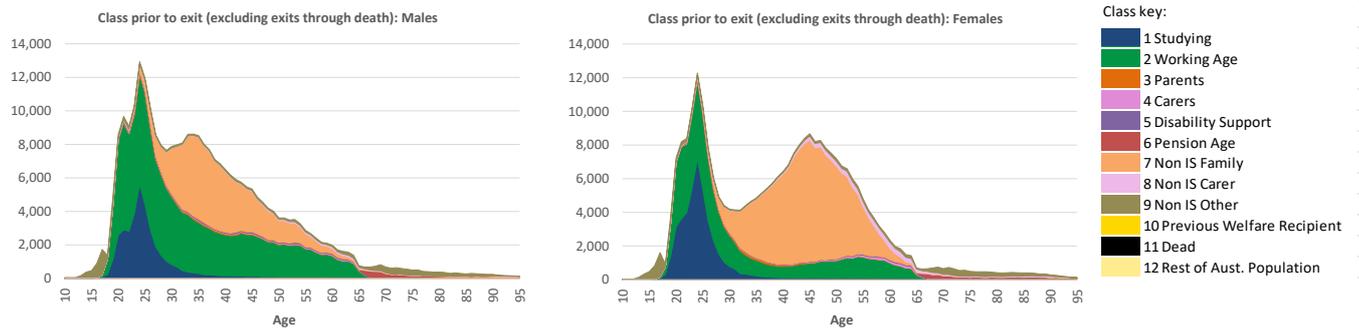
We can see that the numbers of people stopping receiving payments has increased in the last two years with the majority of the increase being exits from non income support classes 7 and 9. This data may be slightly overstated for the 2016 year owing to the data maturity issues (in particular, delayed receipt of information on FTB and child care payments).

Nevertheless there has been some increase in exits from these two classes and this is likely linked to some of the policy changes which have tightened the FTB eligibility criteria.

Profile of exits

The figure below presents the information on the exits observed over the last year; to help focus on the areas of greater interest we have removed the deaths from the charts as these would otherwise dominate the numbers.

Figure 100: Summary of exits between June 2015 and June 2016



We can see that the main classes from which people exit the system are Studying, Working Age and Non-IS Family (noting that most people who are on parenting payment will often transition to family tax benefit only (i.e. the family non IS class), before exiting the system).

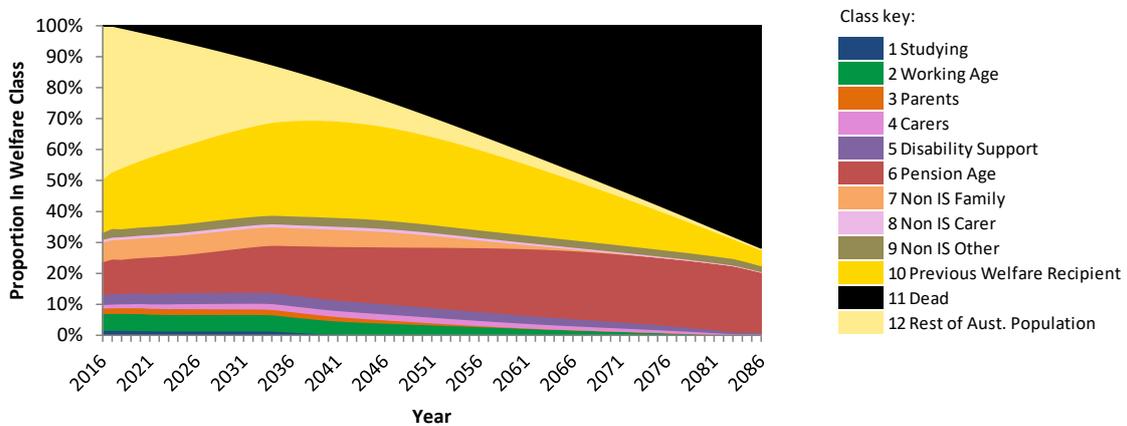
These charts further illustrate the earlier observations that few people exit disability support pension, age pension or carer categories directly, other than by death.

11.4 Trajectories through the system

The expected future trajectory of people in each class can be summarised to a system-wide view for the 8.0 million current welfare recipients and 16.1 million people in the previous welfare recipient and the rest of the Australian population classes, as shown below.

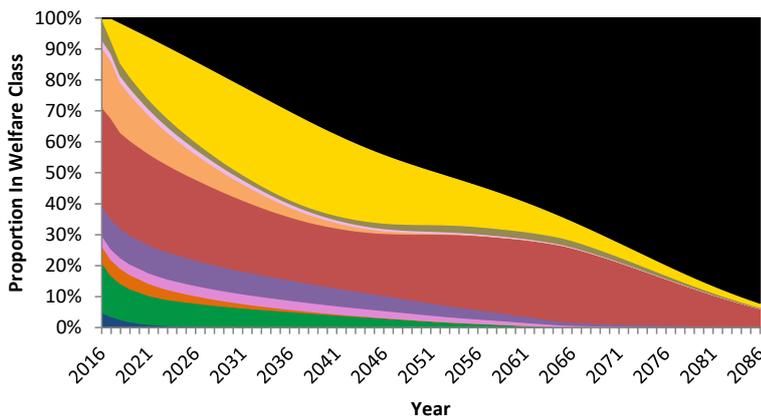
Figure 101: Expected trajectories of a) whole population b) current welfare recipients, and c) previous welfare recipients and the rest of the Australian population

a) Whole population

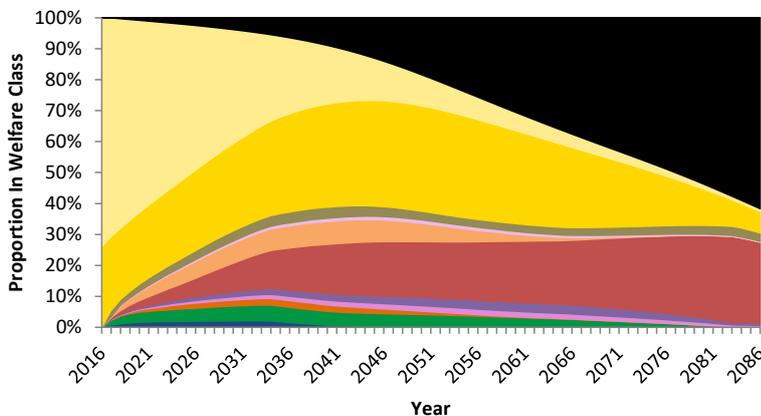


- Class key:
- 1 Studying
 - 2 Working Age
 - 3 Parents
 - 4 Carers
 - 5 Disability Support
 - 6 Pension Age
 - 7 Non IS Family
 - 8 Non IS Carer
 - 9 Non IS Other
 - 10 Previous Welfare Recipient
 - 11 Dead
 - 12 Rest of Aust. Population

b) Current welfare recipients



c) Previous welfare recipients and rest of Aust. population



Much of the shape of these charts is determined by the design of the payment system and the demographics of the welfare recipient population.

Figure 22 provided an overview of which parts of the overall Australian population are reflected in the current welfare recipient group. Not surprisingly in this group there is high utilisation of people above pension age and also of people of parenting age with lower utilisation at other ages. The charts show this as they provide an indication that:

- Many current welfare recipients exit for a period and then return later as they retire (as evidenced by the previous welfare recipient group in the second chart increasing and then declining in size).
- Numbers of people in the parenting and family non IS classes reduce relatively quickly.
- The size of the age pension band first shrinks a little and then increases again as the current parents retire.

Turning now to consider the previous welfare recipients and the rest of the Australian population group: around 30% of this group of people are expected to become current welfare recipients over the next 15 years. Many of the older people in this group will retire and draw pensions and for the younger people there will be a material propensity to utilise working age and family payments as well as smaller likelihoods of receiving other types of support.

Overall, the extended duration of the supports being provided and the smoothness of the patterns stand out, highlighting the challenge of changing these patterns over time. Despite this, there are likely to be targeted interventions that can make small changes to the likelihoods of people following certain trajectories that cumulate to make a significant difference to their life outcomes.

12 Forecasts

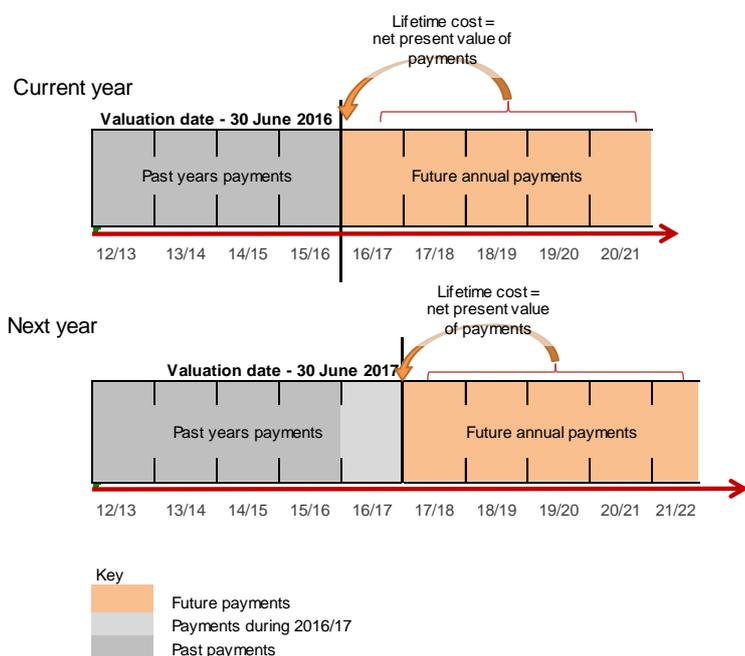
12.1 Lifetime cost forecasts

Lifetime cost forecasts are expectations of lifetime cost at future valuation dates. They provide useful benchmarks for future years' valuations. As each subsequent valuation is performed, the differences to the benchmark can be examined to understand how the lifetime cost results differ from expectations.

Some changes in the valuation results will arise from changes in the experience (either numbers of people in the welfare system or the levels of payment being different to expected); others may be the result of refinements to the methodology or model structure or changes in the assumptions. The changes can be examined further to see whether the underlying causes are factors outside of the control of the Department (such as demographic or economic factors) or those within its control.

The approach for developing the lifetime cost forecasts is illustrated below.

Figure 102: Development of lifetime cost forecasts



Based on the current valuation we have developed a partial forecast of lifetime cost at 30 June 2017 for the people in the 30 June 2016 population who survive to the next valuation. This forecasts is as follows:

Table 50: Lifetime cost forecast

Item	Amount (\$bn)
Lifetime cost at 30 June 2016	4,514
Adjustments:	
<i>less</i> expected expenditure in 2016/17	-122
<i>plus</i> adjustment for discounting to 30 June 2017	271
Expected lifetime cost at 30 June 2017	4,662

At 30 June 2017 we will be able to reassess the lifetime cost for this subset of the population and explain the movements in the lifetime cost assessment. We will also be able to show the additional components of lifetime cost being added for new members of the population, including new birth and migrants.

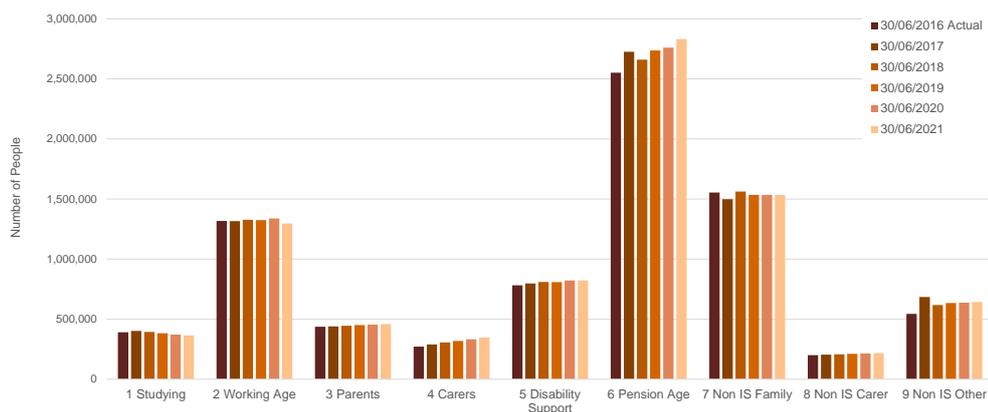
12.2 Forecasts of other information

The model output includes forecasts of information for the numbers of people in each class in future years, the future payment amounts and the numbers of people receiving payments in each payment category.

People in each class

The chart below shows the expected numbers of people in each active class over the period June 2017 to June 2021. The actual numbers of people in each class for the year ending 30 June 2016 have also been included.

Figure 103: Actual and Projected numbers of people in each active welfare class



Notes:

- As noted above the actual numbers will be slightly higher than this as the population is expected to grow through migration and births. Over this 5 year timeframe migration will have the bigger impact as most people only enter the payment system in their own right in their teenage years.
- Consequently the Department should use this information with care and consider making adjustments for the undercount before using them for purposes such as planning or budgeting.

Many of the features of this chart reflect the demographic profile of the current Australian resident population:

- The numbers of age pensioners will increase as the large numbers of people who are in their early 60s today move into retirement. The shape of the chart is stepped as a result of the increases in pension age and the changes to the pension asset test and taper rate both of which start to take effect from 2017. The projected number of age pensioners in 2017 is also impacted by allowances made for data maturity as described in section 3.1.
- The number of people in the carer's class has been growing from year to year and we expect this to continue in the future. As the population ages and there are a higher number of older people needing care, there may be more demand for this payment. Note also that this class includes a group of people over pension age who may be caring for ageing partners.
- The numbers of people studying are expected to reduce as there are fewer people in their late teens and early 20s today than was the case in the recent past.

The number of people in the Working Age class is projected to be fairly stable over time. The change in projected numbers since the baseline valuation reflect lower than expected entries into the class from people outside the welfare system and the flow on impact to lower future class transition assumptions.

There is a step increase in the number of people projected in 2017 for classes 1 and 9 reflecting allowances made for data maturity.

13 Groups of interest

13.1 Introduction

An important purpose of the actuarial valuation is to identify “groups of interest”, which have relatively high lifetime costs, but where, with more effective policy settings or interventions, those costs could be reduced and the lifetime wellbeing of the people in the group improved. These groups will effectively be candidates for the application of the investment approach.

The intention of the investment approach is to direct funding towards evidence based policy interventions which increase the chances of sustained employment and self-reliance. Over time, this may include ceasing policy settings or interventions that are shown not to reduce the lifetime costs of welfare for particular groups; introducing or strengthening policy settings or interventions that encourage self-reliance for particular groups; or investing in more tailored and effective policy settings or interventions for individuals and families who are identified as being most at risk of long-term welfare dependency.

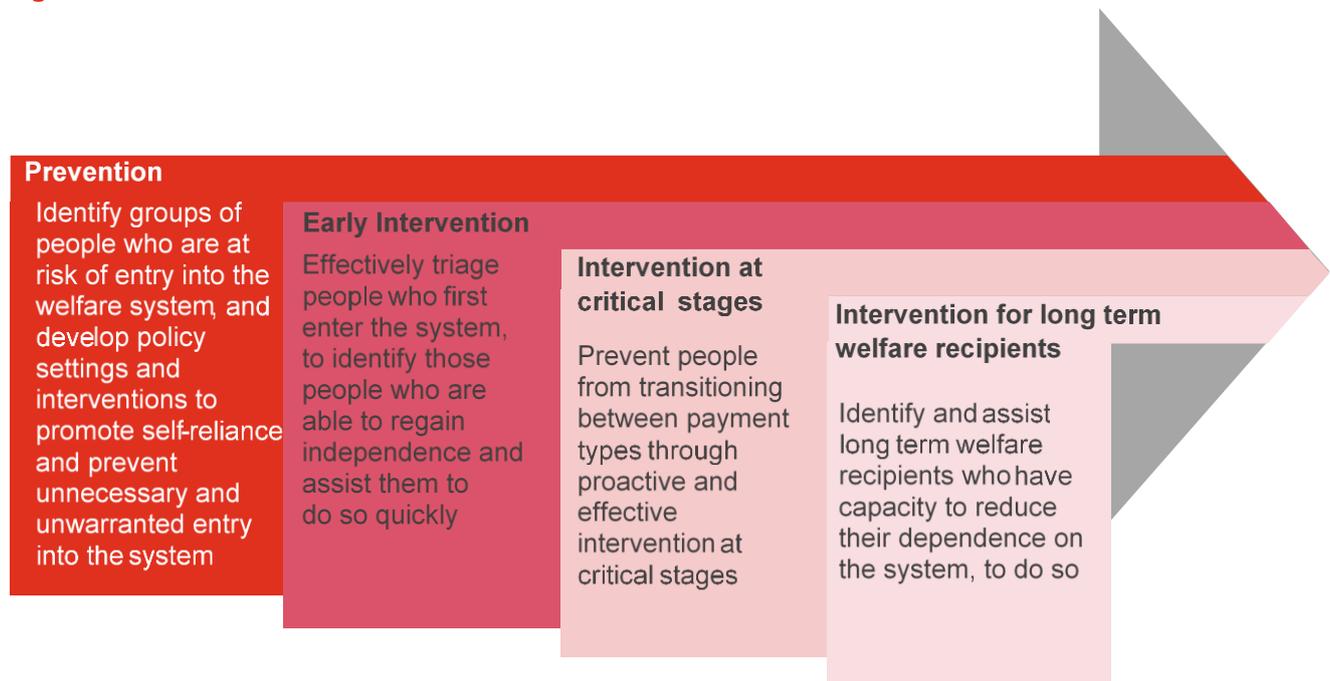
In this section we provide an update on the groups of interest work undertaken for the baseline valuation and discuss the development of further groups of interest.

13.2 Baseline valuation groups of interest

The way in which the groups were identified and described in the baseline valuation was informed by the model structure and data, which effectively provide a sorting mechanism to facilitate system-wide thinking. This included dimensions such as age, gender, class, family situation, highest educational attainment, and some other factors, such as the duration of a group in a particular class.

The groups of interest identified referenced the following framework which provides a structure to the overarching objective of assisting people with the capacity to work, to do so.

Figure 104: Intervention framework



The baseline valuation report provided a number of illustrative examples of potential groups of interest. These were presented as a straw man with the aim of facilitating further discussion and to assist the Department with their thinking on group prioritisation.

The examples presented were as follows:

Table 51: Illustrative examples of potential groups of interest

Framework domain	Examples
Prevention	<ul style="list-style-type: none"> • Post age 55 entry into working age income support • Exits within previous 3 years • Teenage entry into studying income support
Early Intervention	<ul style="list-style-type: none"> • Young carers entering between ages 15 and 24 • Young parents
Intervention at Critical stages	<ul style="list-style-type: none"> • Parents transitioning into working age payments • Students who transition to working age payments • Working age to disability support pension transitions • Older people entering carer payment (those over pension age)
Intervention for long term welfare recipients	No particular groups were identified in the baseline report, however this would be relevant for any long term income support recipients

Following the baseline valuation the Department undertook further work and identified three initial groups of interest:

- Young parents
- Young carers
- Students transitioning to working age

The work to develop, test and implement interventions for these groups is outside of the scope of this actuarial report.

13.3 Update on initial groups of interest

Young parents

The baseline valuation demonstrated that young parents aged 18 and under are particularly vulnerable to welfare dependency. There were 4,370 young people who were receiving a parenting payment during 2014-15.

The table below provides a summary of key statistics for this group and the equivalent group identified at 30 June 2016 based on the payment experience over the 2015-16 year.

Table 52: Summary of key statistics for young parents

Key statistic	2015 valuation	2016 valuation
Number of people	4,370	3,760
Average lifetime cost	\$547,000	\$648,000
Expected outcomes in 10 years' time	72% still receiving income support 23% receiving other payments 5% not receiving welfare	79% still receiving income support 16% receiving other payments 5% not receiving welfare
Expected outcomes in 20 years' time	43% still receiving income support 39% receiving other payments 18% not receiving welfare	57% still receiving income support 24% receiving other payments 19% not receiving welfare
Expected outcomes over remainder of future lifetime	28 years receiving income support payments (excl. Age Pension) 9 years receiving non-income support payments only 16 years not receiving welfare 18 years receiving Age Pension	31 years receiving income support payments (excl. Age Pension) 7 years receiving non-income support payments only 16 years not receiving welfare 17 years receiving Age Pension
Proportion with employment earnings over last year	<i>Not available (this information was not considered in the baseline valuation)</i>	6%

Note that the expected outcomes may not sum to 100% due to rounding.

There were 3,760 young people who were receiving a parenting payment in 2016, a smaller number than in 2015. This will be because some of the original group are now over age 18 and the number of new young parents is less than those that left.

An updated assessment of the average lifetime cost for this Young Parents group is \$648,000, which is around 18% higher than the assessed lifetime cost at the baseline valuation.

Whilst the updated statistics differ somewhat from those developed from the baseline valuation analysis they confirm the overall conclusions of the baseline analysis: that this group is expected to have high lifetime cost and spend a large proportion of their future lifetimes receiving some form of income support.

This increase is consistent with the general increase in average lifetime cost seen for the Parenting class and is of somewhat greater magnitude given the younger average age of this group. The increase is largely a result of the modelling refinements we have made to improve the possible granularity of examining the average lifetime cost and future welfare usage outputs.

In particular, the inclusion of the employment earnings indicator is serving to differentiate the expected outcomes for this group compared to those for other young parents. This is because only 6% of the Young Parents group reported any employment earnings in the 2016 financial year, compared to 35% across all people receiving parenting payments. The effect of this is twofold: firstly this group is expected to have higher annual payment amounts as they are more likely to be receiving the full rate of payment; and secondly, this group is more likely to continue on Working Age payments after their eligibility for parenting payments cease, ultimately spending more years receiving income support than other people in the Parenting class. This is shown in the updated assessment with an increase to the expected number of future years receiving income support payments.

What has happened to the 2015 group of interest?

It is interesting to consider the experience of the approximately 4,370 young parents that were identified in the baseline valuation. The table below provides a summary of the expected and actual proportion of the original group who are in each class at 30 June 2016.

Table 53: Summary of expected and actual class movements for young parents (as % of cohort)

Class at June 2016	1	2	3	4	5	6	7	8	9	10	11
Expected %	1%	4%	94%	<1%	<1%	<1%	1%	<1%	<1%	<1%	<1%
Actual %	1%	5%	93%	<1%	<1%	<1%	1%	<1%	<1%	<1%	<1%
Difference	<1%	1%	-1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%

Of the young parents identified in 2015, the majority have remained on parenting payments in 2016 as expected. A slightly higher than expected percentage of these people transitioned to the Working Age class, and this may be partially due to employment earnings not being considered in the baseline valuation.

These figures have been rounded and some figures may also be impacted by data maturity, including natural delays in the assessment of certain payment classes.

Young carers

The baseline valuation demonstrated that young carers are also very vulnerable to welfare dependency. There were around 11,200 young people aged 24 and under who were receiving a Carer payment during 2014-15. This group does not consider the people who receive only carer allowances and carer supplements, as these people are in the Carer non income support class.

The table below provides a summary of key statistics for this group and the equivalent group identified at 30 June 2016 based on the payment experience over the 2015-16 year.

Table 54: Summary of key statistics for young carers

Key statistic	2015 valuation	2016 valuation
Number of people	11,200	10,470
Average lifetime cost	\$464,000	\$482,000
Expected outcomes in 10 years' time	61% still receiving income support 12% receiving other payments 27% not receiving welfare	63% still receiving income support 12% receiving other payments 26% not receiving welfare

Key statistic	2015 valuation	2016 valuation
Expected outcomes in 20 years' time	48% still receiving income support 18% receiving other payments 34% not receiving welfare	48% still receiving income support 16% receiving other payments 36% not receiving welfare
Expected outcomes over remainder of future lifetime	25 years receiving income support payments (excl. Age Pension) 5 years receiving non-income support payments only 20 years not receiving welfare 17 years receiving Age Pension	25 years receiving income support payments (excl. Age Pension) 5 years receiving non-income support payments only 20 years not receiving welfare 17 years receiving Age Pension
Proportion with employment earnings over last year	Not available (this information was not considered in the baseline valuation)	18%
Care recipient relationship proportions	Not available (this information was not considered in the baseline valuation)	For these young carers: <ul style="list-style-type: none"> • 60% caring for a parent • 4% caring for a child • 4% caring for a partner • 32% caring for other relations

Note that the expected outcomes may not sum to 100% due to rounding.

There were 10,470 young people who were receiving a carer payment in 2016, again a lower number than in 2015.

An updated assessment of the average lifetime cost for this Young Carers cohort is \$482,000, which is 4% higher than the assessed cost at the baseline valuation. Although the model has also been refined for the Carers class the average outcomes expected for this group of young carers are similar to those developed in the baseline analysis, with the expectations of the future welfare system utilisation similar between both assessments. This is likely to be as the group has a more similar risk profile to the class average, for instance 18% of the group have some employment earnings which is fairly consistent with the proportion for all carers.

At this valuation, we have incorporated several new variables about the care recipient, such as the age of the care recipient and their relationship to the carer. The majority of the Young Carer cohort is caring for an older parent or an individual other than their child, parent or partner.

What has happened to the 2015 group of interest?

It is interesting to consider the experience of the approximately 11,200 young carers that were identified in the baseline valuation. The table below provides a summary of the expected and actual numbers of the original group who are in each class.

Table 55: Summary of expected and actual class movements for young carers (as % of cohort)

Class at June 2016	1	2	3	4	5	6	7	8	9	10	11
Expected %	1%	8%	2%	82%	<1%	<1%	<1%	1%	<1%	4%	<1%
Actual %	2%	9%	3%	80%	<1%	<1%	<1%	2%	<1%	5%	<1%
Difference	<1%	<1%	<1%	-2%	<1%	<1%	<1%	1%	<1%	1%	<1%

Of the Young Carers cohort identified in 2015, the majority remained on carer payments in 2016 as was expected, although the proportion of people moving to other income support classes, the carer non income support class and exiting are all slightly higher than expected.

These figures have been rounded and some figures may also be impacted by data maturity, including natural delays in the assessment of certain payment classes such as carer payments.

Students transitioning to working age

In 2014-2015, there were 392,000 people receiving studying payments. The majority of people receive studying income support payments for some years and then exit. However a proportion transition to other income support payments. It was estimated that in 10 years, around 25 per cent of those students will be receiving some type of income support payments.

Additional Departmental analysis shows that since 2003 there were around 13,400 vocational and university students who started receiving a student payment aged 17 to 19 and experienced a 12 month period of

dependence on unemployment payments immediately after stopping study. Of these former students, 6,600 were still receiving working age payments in 2014-2015. This group are expected to have a higher expected future lifetime cost than other students and has been identified as a group of interest.

The table below provides a summary of key statistics for this group and the equivalent group identified by the Department at 30 June 2016 based on the payment experience over the 2015-16 year.

Table 56: Summary of key statistics for previous young students who have transitioned to working age

Key statistic	2015 valuation	2016 valuation
Number of people	6,600	7,160
Average lifetime cost	\$304,000	\$282,000
Expected outcomes in 10 years' time	44% still receiving income support 14% receiving other payments 42% not receiving welfare	39% still receiving income support 13% receiving other payments 47% not receiving welfare
Expected outcomes in 20 years' time	36% still receiving income support 15% receiving other payments 50% not receiving welfare	30% still receiving income support 14% receiving other payments 56% not receiving welfare
Expected outcomes over remainder of future lifetime	19 years receiving income support payments (excl. Age Pension) 4 years receiving non-income support payments only 24 years not receiving welfare 17 years receiving Age Pension	16 years receiving income support payments (excl. Age Pension) 5 years receiving non-income support payments only 26 years not receiving welfare 17 years receiving Age Pension
Proportion with employment earnings over last year	Not available (this information was not considered in the baseline valuation)	58%

Note that the expected outcomes may not sum to 100% due to rounding.

There were 7,160 people identified by the Department in 2016, higher than in 2015.

An updated assessment of the average lifetime cost for this cohort is \$282,000, which is \$22,000 lower than the assessed cost at the baseline valuation. This reduction is driven by an increase in exits from the Working Age class, and a decrease in entries to the Working Age class from classes 10 and 12, as a result of the implementation of the economics adjustments module (section 4.5). This module has aligned the projections with the Treasury outlook for unemployment, resulting in more people being assumed to find employment and hence cease requiring income support in future years. The effect of this module is more substantial on this cohort due to their relatively younger age than the overall Working Age class.

At this valuation, we have also incorporated a new variable regarding the earnings of income-support recipients. The proportion of this cohort with earnings is 7% higher than the average for working age recipients aged 21-32 (the same age range of this cohort). The slightly higher earnings of this cohort contributes to a lower average lifetime cost relative to equivalently aged people in the Working Age class (\$279,000).

What has happened to the 2015 group of interest?

Table 57: Summary of expected and actual class movements for previous young students who had transitioned to working age (as % of cohort)

Class at June 2016	1	2	3	4	5	6	7	8	9	10	11
Expected %	4%	73%	3%	1%	1%	<1%	<1%	<1%	1%	18%	<1%
Actual %	6%	69%	3%	1%	1%	<1%	<1%	<1%	1%	20%	<1%
Difference	2%	-3%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	2%	<1%

Of the previous young students who had transitioned to the working age cohort identified in 2015, the majority remained on working age payments in 2016 as was expected. However, the proportion remaining was slightly lower (3%) than expected with more people returning to studying payments and exiting the system than expected.

These figures have been rounded and some figures may also be impacted by data maturity, including natural delays in the assessment of certain payment classes.

13.4 Further groups of interest

The groups of interest identified through the baseline valuation are not exhaustive and it is anticipated that further groups of interest will be identified subsequent to the 2016 valuation.

To support the development of these groups PwC will be working in conjunction with the Department to use the model to explore the population results more fully. However, any model, however sophisticated, is only ever able to be a simplified representation of complex real life situations, and it will therefore always be helpful to consider other sources of information in conjunction with the information produced by the model. This may include further insights developed from historical analysis; and information drawn from other sources, such as research and social policy experts.

The introduction of new class characteristic variables into the model provides the ability to further distinguish which groups of people are more likely to have high future welfare dependence. For instance, the payment type and employment earnings indicator can be used to develop information about which groups of students are more likely to transition from studying to other forms of welfare support over their lifetime (with high lifetime cost), rather than exiting the Studying class and remaining out of the system for the remainder of their lifetime (with low lifetime cost).

The statistical analysis which underpins the risk based assumptions demonstrated that all the additional class characteristic variables had some significance in differentiating people's likely outcomes. In particular, the employment earnings indicator provides additional insights with those people without employment earnings expected to have a higher future lifetime cost than those with earnings - as seen in the Young Parents cohort.

The valuation model is able to be run for any group of people of sufficient size and homogeneity and the model outputs include a range of charts that are available by age, gender and other characteristics. This enables the expected experience for any group to be examined in more detail.

As part of this valuation report we have examined each class in more detail with the results and relevant charts being shown in sections 8, 9 and 10. We anticipate that the Department will build on this analysis over the coming months and use the valuation model to explore the outcomes for further potential groups of interest.

Ultimately, any further groups of interest will be selected by the Department.

14 Additional insights

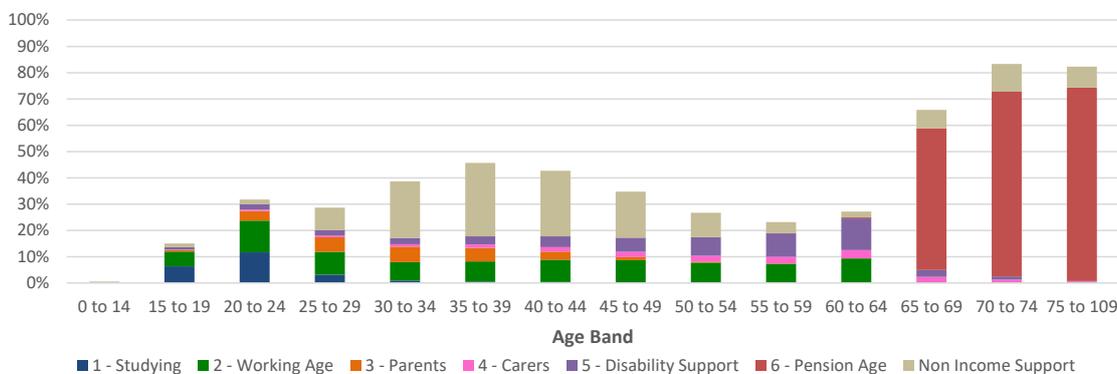
In addition to the results provided in the sections above, helpful information and insights can be gleaned from the statistical analysis underlying the model, the model outputs themselves and from exploration of the historical data. A number of these are discussed below.

14.1 Welfare system utilisation

Earlier in this report (Figure 22) we provided an illustration of the shape of the Australian resident population by age and gender and their welfare system utilisation. In this analysis we explore this further, through considering how the utilisation varies for different groups of people within the population.

For clarity, we have focused on the groups of people in the income support classes and grouped all the non-income support classes together. The figure below shows the overall welfare system utilisation for people in different age bands.

Figure 105: Welfare utilisation by age band – whole population



Unsurprisingly, the age bands with highest utilisation are those above retirement age with around 70% of people being in an income support class, predominantly the Age Pension class.

For those people below retirement age, there is an initial peak for ages 20 to 24 when around 30% of the population are in one of the income support classes, with the studying and working ages classes being those most used by people in this age group. The utilisation then falls to 17% to 20% for people in the age range 25 to 59 before increasing to 25% for those aged 60 and above.

Within this pre-retirement age range people of all ages utilise working age payments; younger people are more likely to be receiving studying or parenting payments and older people are more likely to be receiving carer payment or the disability support pension. It is interesting to note that 9% of people aged 55 to 59 and 12% of people aged 60 to 64 are disability support pension recipients.

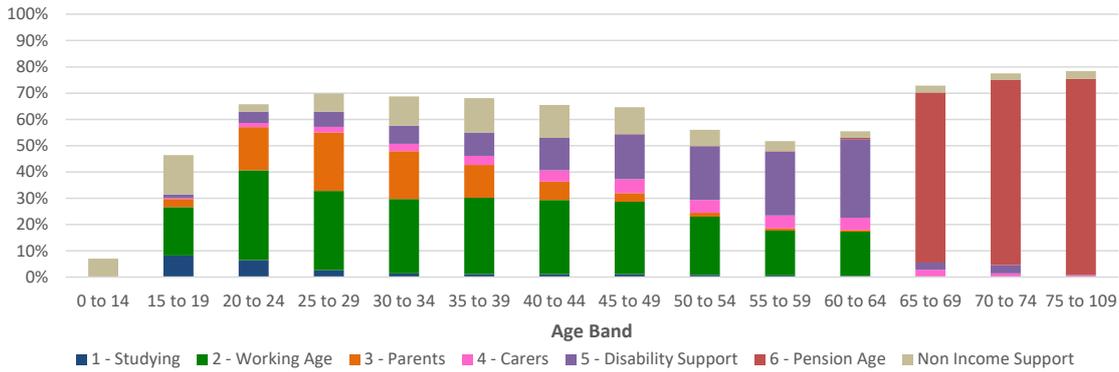
We can also see groups of people receiving non income support payments, especially over the age range 25 to 55; as most of these payments are FTB and child care this is in line with expectations. 25% to 30% of people are receiving these payment types at ages 35 to 44.

This population level utilisation information provides a benchmark to which different groups within the population can be compared.

Indigenous utilisation

The chart below provides the equivalent information for the Indigenous population. Note that the data variable which captures this information is a self-reported variable both within the administrative data and the data underpinning the development of the overall population. It is therefore subject to a degree of uncertainty.

Figure 106: Welfare utilisation by age band – Indigenous people



The welfare utilisation is much higher for Indigenous people than the population average with over 60% of 20 to 29 year olds receiving some income support payments and around 50% of people over the age range 30 to 64. This is around three times higher than the overall population average.

The greater utilisation is present across all the main income support payment types. In particular there is much greater use of parenting payment for people aged 15 to 29, while the usage of working age and the disability support pension is higher throughout all pre-retirement ages. Although the proportion of people studying at higher ages is relatively small, there is also much greater use of studying payments over the age range 45 to 64 than for other groups of the population.

Utilisation for single people vs. partnered people

The following two charts provide a comparison of the welfare utilisation for single vs. partnered people.

Figure 107: Welfare utilisation by age band – single people

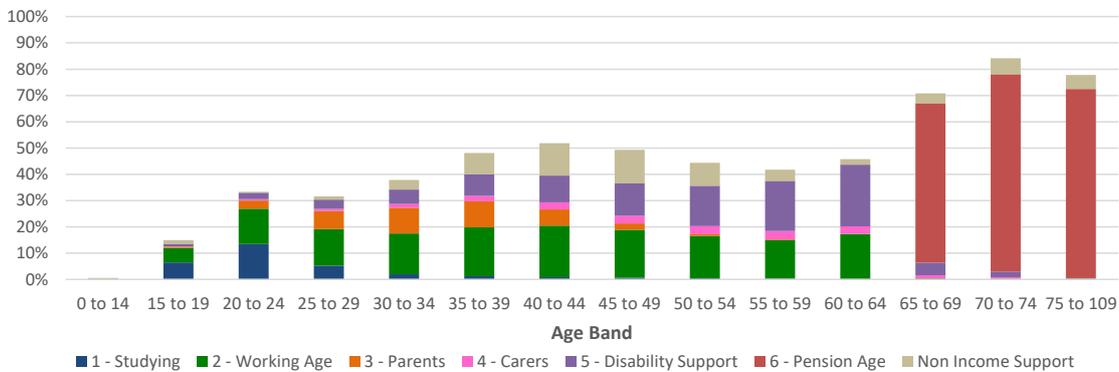
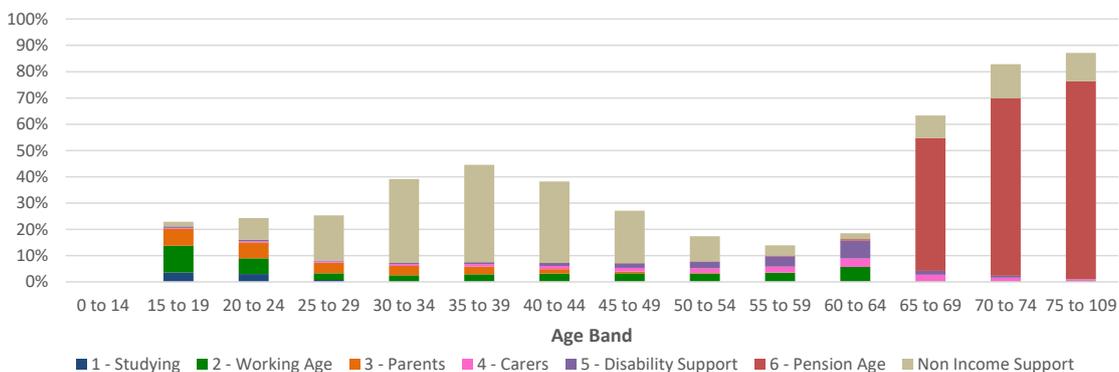


Figure 108: Welfare utilisation by age band – partnered people



For people below retirement age, we can see that single people are much more likely to access income support payments. There are likely to be a number of underlying causes for this. For example, people with severe disabilities are more likely to need support and, perhaps, more likely to remain single over the course of their lives. However, the most notable difference is for working age payment recipients with only 2% to 4% of partnered people aged 25 to 55 receiving these payments compared to 14% to 20% of single people.

For most income support payments, the combined income of partnered people influences their payment eligibility. As can be seen in Figures 107 and 108, a higher proportion of single people tend to receive income support payments whilst a higher proportion of partnered people access supplements. For example, for people age 65 to 74 we can see that single people are more likely to receive the age pension and partnered people are more likely to be receiving supplementary payments only. However, the difference is less for those over age 75.

Utilisation for people with and without children

This final comparison compares the welfare utilisation of people with and without children. This information is somewhat uncertain as child information is known to be only partially complete within the administrative data for older people who have not recently received any child related payments and also for people who have not accessed the welfare system. Nonetheless, the differences between the two population groups are stark, as can be seen from the following two charts.

Figure 109: Welfare utilisation by age band – people with children

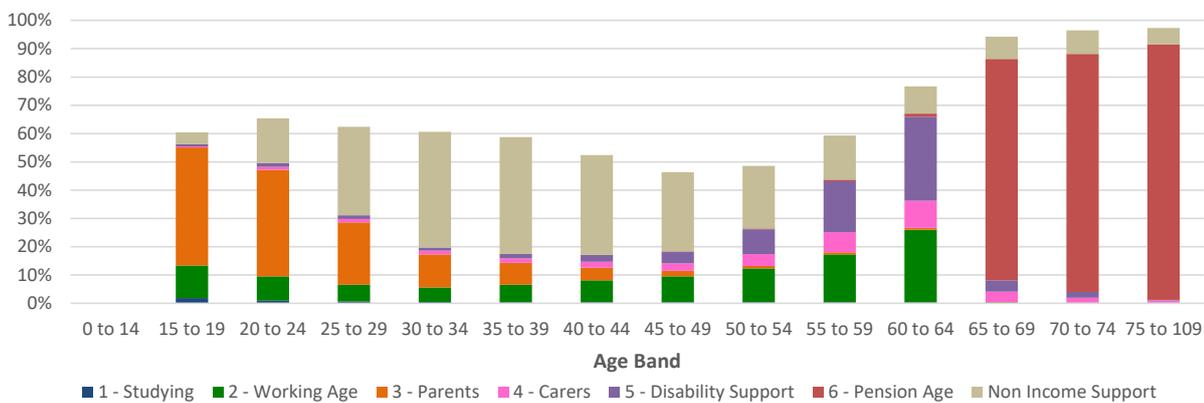
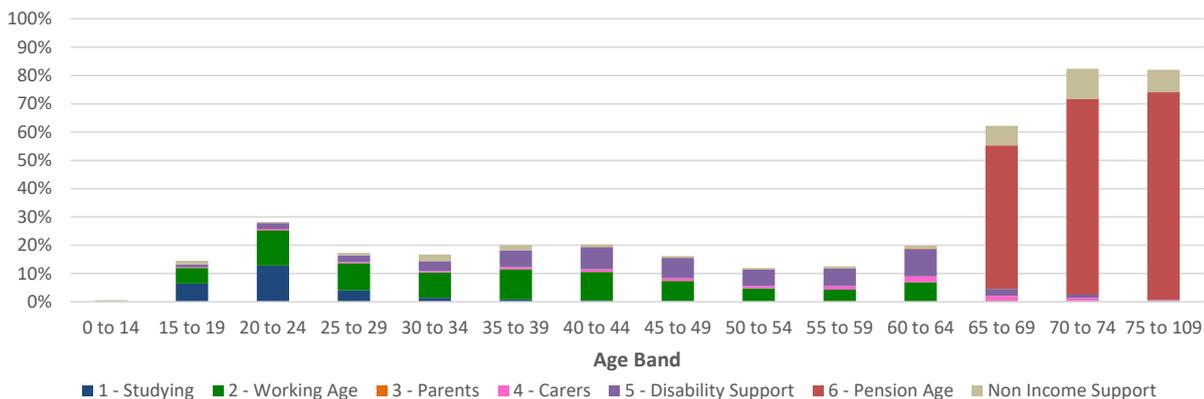


Figure 110: Welfare utilisation by age band – people without children



In many ways this reflects the design of the payment system: Parenting Payment, FTB and child care payments are provided to assist people as they look after children. Further, there is a greater chance of people with children needing to access Carer payment. Conversely, more people without children are receiving studying payments and, at younger ages, disability support pension.

In the higher ages (around age 50 and above), the charts show that people with children are more likely to receive income support (including working age payments, carer payments, disability support and age pension). This is interesting but less intuitive, and may simply be reflecting the incomplete nature of the children data, as people utilising the welfare system are more likely to have their dependent children recorded.

14.2 Geographic information

We have undertaken an initial analysis of the extent to which welfare utilisation varies by location and by the Socio-Economic Index For Area (SEIFA). SEIFA is developed by the ABS based on the Australian Statistical Geography Standard Remoteness Structure and ranks areas within Australia by relative socio-economic advantage and disadvantage with the index based on information drawn from the Census. A lower SEIFA quintile indicates that an area is relatively disadvantaged compared to an area with a higher SEIFA quintile. Our analysis draws on the location information in the data with people in each location being assigned to both a location category and a SEIFA quintile.

Note that the current valuation model does not explicitly consider location in developing the lifetime cost assessments. Hence the information developed for each location is a reflection of the current welfare utilisation for the population and their demographic and past welfare utilisation characteristics of people which impact the expected future welfare utilisation and cost. The variation in results illustrates the extent to which the current model is indirectly allowing for geographic location and socio-economic index as factors in predicting welfare usage.

The tables below summarise the numbers of people in each combination of these categories and provides two indicators which summarise aspects of welfare utilisation: the proportion of the population in one of the income support classes and the average lifetime cost for these people.

Table 58: Australian resident population by location category and SEIFA quintile (millions)

Location category	SEIFA quintile					Total
	0-20%	20-40%	40-60%	60-80%	80-100%	
Major Cities of Australia	2.1	2.2	3.4	4.1	5.2	17.0
Inner Regional Australia	1.2	1.3	1.2	0.6	0.2	4.4
Outer Regional Australia	0.7	0.7	0.4	0.2	0.1	2.1
Remote and Very Remote Australia	0.2	0.1	0.1	0.05	0.03	0.6
Total	4.2	4.3	5.0	5.0	5.5	24.0

Note that people living overseas have been excluded and the total column does not equal the sum across the SEIFA quintiles due to the SEIFA quintile being missing for a small number of people in the data.

Table 59: Income support utilisation by location category and SEIFA quintile

Location category	SEIFA quintile					Total
	0-20%	20-40%	40-60%	60-80%	80-100%	
Major Cities of Australia	28%	26%	22%	20%	18%	22%
Inner Regional Australia	34%	29%	29%	24%	17%	29%
Outer Regional Australia	32%	26%	28%	26%	11%	28%
Remote and Very Remote Australia	29%	23%	12%	22%	10%	22%
Total	30%	27%	24%	21%	18%	24%

Table 60: Average lifetime cost for people in income support classes by location category and SEIFA quintile (\$'000)

Location category	SEIFA quintile					Total
	0-20%	20-40%	40-60%	60-80%	80-100%	
Major Cities of Australia	321	306	293	278	259	288
Inner Regional Australia	313	298	295	286	258	299
Outer Regional Australia	312	304	302	309	324	307
Remote and Very Remote Australia	356	318	314	345	374	341
Total	319	304	294	282	260	292

We make the following observations:

- There are only a small number of people in “Remote and Very Remote Australia”. As such, results for this category may be influenced by the specific characteristics of a small number of regions.
- In general, people in lower SEIFA quintiles are more likely to be receiving income support payments. In the lowest SEIFA quintile, 30% of people are on income support; this compares with 18% in the highest quintile. This is not surprising, as income support is intended for those who have low income or wealth and the eligibility requirements typically include income and asset tests.
- The proportion of people utilising income support does not consistently increase by remoteness; regional locations have higher welfare utilisation than major cities, however remote areas have utilisation similar to the cities. The reasons for this are less clear, although the populations in remote areas are small and so it could be due to particular industries operating in specific remote areas.
- People in the income support classes who are living in locations with lower SEIFA quintiles and/or living in more remote regions have a higher average lifetime cost. The average lifetime cost in the lowest SEIFA quintile is 23% higher than for the highest quintile, while the average lifetime cost for ‘Remote Australia’ is 18% higher than the average cost for ‘Major Cities’. This is most likely reflecting the higher likelihood of these people to remain on social welfare for longer.
- For ‘Outer Regional Australia’ and “Remote and Very Remote Australia”, we note that the higher SEIFA quintiles have higher lifetime cost. The characteristics recorded for people in these areas suggest they will have a higher average lifetime cost, most likely as a result of greater persistency.

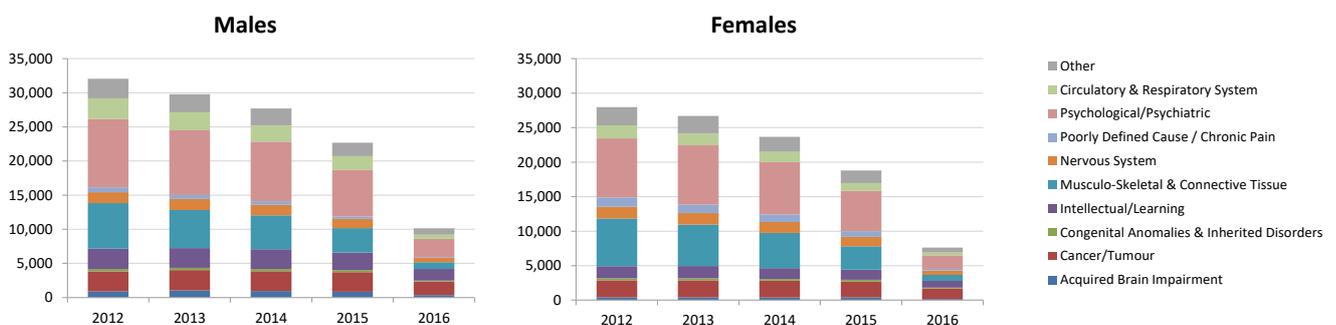
These results may also be influenced by the demographic mix of people in each location.

14.3 Medical condition profile for DSP recipients

In section 0 we observed that the number of new entries to disability support pension had reduced significantly in recent years. This is likely to be as a result of a series of policy changes which have tightened the eligibility criteria for the Disability Support Pension. In this section we consider the medical condition profile of these new entrants and explore whether the profile has changed.

The charts below show the numbers of male and female new entrants by primary medical condition:

Figure 111: Number of new entrants to Disability Support Pension by primary medical condition



We make the following observations:

- The number of new entries has been reducing steadily over the last few years, as shown by the columns decreasing in total.
- The reduction in numbers has occurred for both genders and whilst there are some subtle differences in the mix of medical conditions the key features of the experience are similar for both genders.
- There have been very few entries in the 2015/16 year. This has been discussed with the Department and could be at least partly a result of the natural delays that occurred between when an application is first lodged and when the claim assessment is completed.

In addition, we can see that although there have been reductions in all medical condition categories, the profile of new Disability Support Pension recipients has also been changing with some conditions reducing by

significantly more than others. The table below quantifies the reduction between the 2011-12 and 2014-15 years by medical condition.

Table 61: Summary of changes in numbers of DSP entrants between 2011-12 and 2014-15

Primary Medical Condition	Entrants 2011-12	Entrants 2014-15	% Change
Acquired Brain Impairment	1,322	1,250	-5%
Cancer/Tumour	5,391	5,145	-5%
Congenital Anomalies & Inherited Disorders	656	577	-12%
Intellectual/Learning	4,720	4,021	-15%
Musculo-Skeletal & Connective Tissue	13,596	6,995	-49%
Nervous System	3,256	2,700	-17%
Poorly Defined Cause / Chronic Pain	2,113	1,159	-45%
Psychological/Psychiatric	18,557	12,732	-31%
Circulatory & Respiratory System	4,892	3,113	-36%
Other	5,391	5,145	-5%

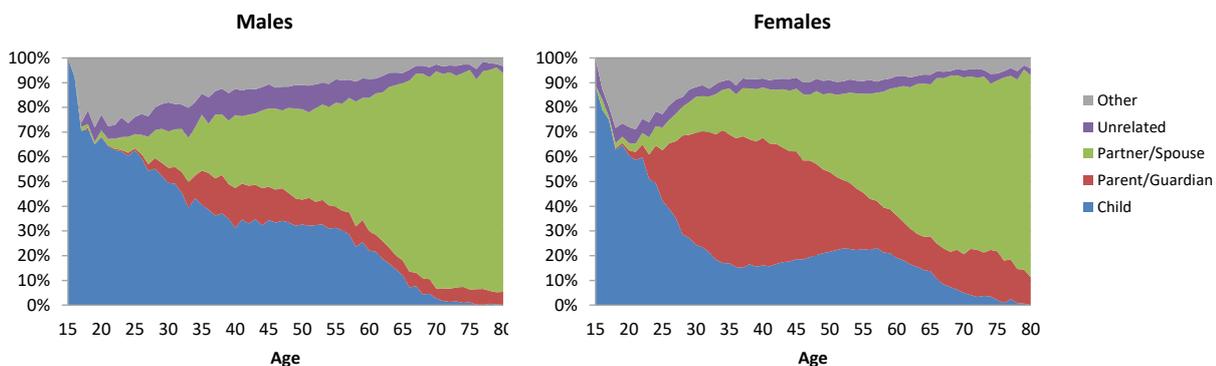
We observe that:

- The reduction in entries has been most significant for people with musculoskeletal and connective tissue disorders; poorly defined cause/chronic pain; circulatory and respiratory system disorders or psychological/psychiatric conditions
- Conversely, the number of new entries from people with Cancer, Acquired Brain Impairment and Congenital Anomalies & Inherited Disorders have only reduced a small amount.

14.4 Profile of carer payment recipients

The charts below show the proportion of men and women in the Carers class split by their relationship with their primary care recipient. The relationship descriptions refer to the identity of the carer, for example, “Child” means that the carer is a child of the care recipient (i.e. they are caring for their parent).

Figure 112: Profile of carers by relationship with care recipient

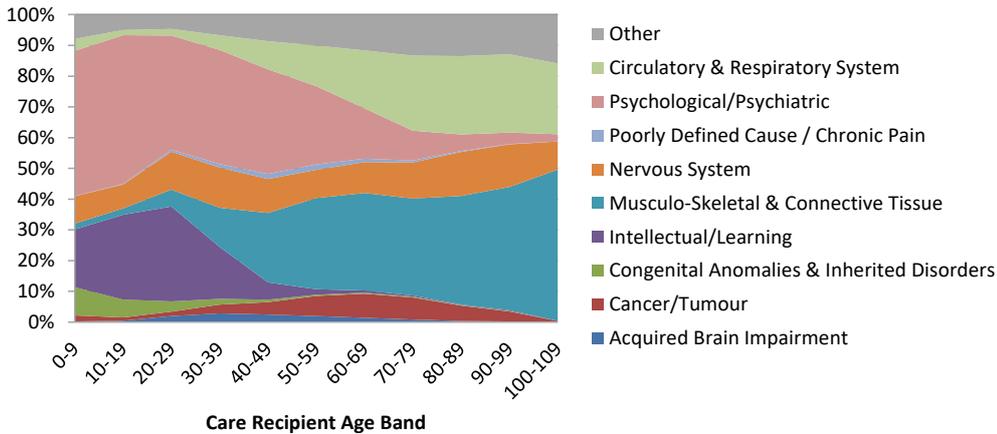


We observe the following:

- The trends by age are generally intuitive:
 - The youngest carers tend to be children caring for their parents;
 - Carers around the parenting age tend to be parents caring for their children; and
 - Older carers tend to be caring for their partner or spouse.
- There are significantly more women than men who are carers for children.

The following chart shows the proportion of care recipients (who are being cared for by people in the Carers class) with each medical condition category by care recipient age.

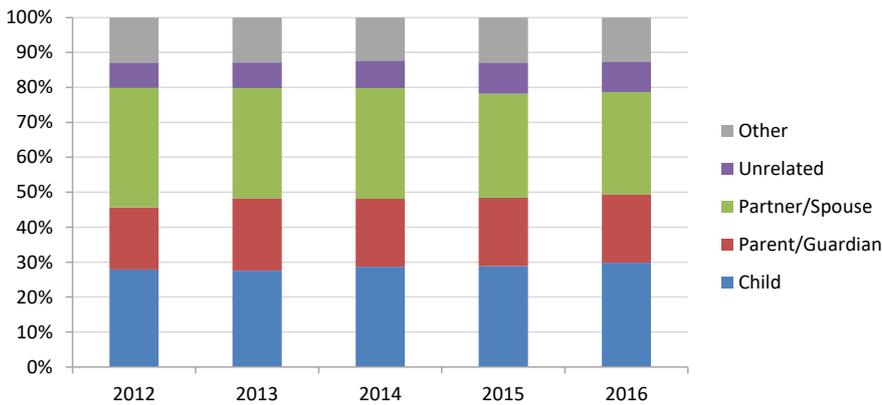
Figure 113: Profile of primary care recipient medical condition by age of care recipient



Younger care recipients are generally children who have intellectual/learning disabilities or psychological/psychiatric disorder. Conversely, the most common medical conditions for older care recipients are circulatory and respiratory system and musculo-skeletal and connective tissue. These generally reflect the typical medical conditions requiring care during the natural ageing process.

The following chart shows the profile of people who have entered the Carers class in recent years by their relationship with their primary care recipient.

Figure 114: Proportion of new entrants into Carers class by relationship to care recipient



From the chart above, we can see that the profile of new entrants has been relatively stable. This is despite some fluctuation in the total number of entrants into the Carers class. There is perhaps a small but steady increase in the proportion of child carers (i.e. people caring for their parents).



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Appendix A Policy changes

In the course of analysing the data, we have considered policy changes that may have impacted the past experience, and where possible taken these into account in setting assumptions for the model. The following table summarises the most material policy changes we have considered, noting that this is not an exhaustive list as we are also aware of a large number of other policy changes.

Our general approach to these has been to ask questions when we have observed discontinuities, features or trends in the experience, to determine if there are any policy changes that could explain these.

Table 62: Policy changes which have taken effect prior to the valuation date

Amendment	Year Effective	Description
Changes to FTB income test Family Assistance, Social Security and Veterans' Affairs Legislation Amendment (2005 Budget and Other Measures) Act 2006	2006	From 1 July 2006, the lower income threshold for Family Tax Benefit Part A was increased from \$33,361 to \$37,500.
Welfare to Work and Other Measures Employment and Workplace Relations Legislation Amendment (Welfare to Work and Other Measures) Act 2005	2006	From 1 July 2006 there were multiple changes to the work test and eligibility for allowances for new and recent Disability Support Pension (DSP) applicants. The eligibility and activity requirements for Parenting Payment recipients changed. From 1 July 2006 Taper rates and income thresholds for many payments were altered. Changes were made to the qualification for Pensioner Education Supplement (PES). A higher rate of Mobility Allowance was made available for some people.
Age Pension assets test taper rate Tax Law Amendment (Simplified Superannuation) Act 2007	2007	Age Pension 'assets test' taper rate halved.
Secure and Sustainable Pension Reform package Social Security and Other Legislation Amendment (Pension Reform and Other 2009 Budget Measures) Act 2009	2009	There was a one-off increase to the rate of many pensions, and changed indexation arrangements. The Pension Supplement was introduced as part of reform package and took effect from 20 September 2009. The 'income test' taper rate increased. The Pension Bonus Scheme was closed to new registrations from 1 July 2014. The Commonwealth Seniors Health Card income test was modified. A Carer Supplement was introduced for Carer Payment recipients. Indexation was changed for certain FTB payments. This Act introduces a new Work Bonus into the social security law, which allows for a certain amount of employment income that is earned, derived or received in an instalment period by a pensioner who is of age pension age to be disregarded for the purposes of the income test.
Training Incentives Social Security Amendment (Training Incentives) Act 2009	2009	The introduction of a training supplement was made available to recipients of Newstart Allowance and Parenting Payment.
Carer Payment Social Security Legislation Amendment (Improved Support for Carers) Act 2009	2009	Eligibility changed for individuals providing care for children with a disability.
Parenting Payment transitional arrangement Social Security Amendment (Parenting Payment Transitional Arrangement) Act 2011	2011	Changed ability to access transitional arrangements.
Work rule for Disability Support Pension Social Security and Other Legislation Amendment (Disability Support Pension Participation Reforms) Act 2012	2012	From 1 July 2012, all Disability Support Pension recipients can work up to 30 hours a week without having their payment suspended or cancelled.

Appendix A Policy changes

Amendment	Year Effective	Description
Changes to the eligibility criteria for Youth Allowance (other) and Newstart Allowance Social Security and Other Legislation Amendment (Income Support and Other Measures) Act 2012	2012	The maximum age for youth allowance for non-students and the minimum qualification age for Newstart allowance increased from 21 to 22 years. The income free area value was increased from \$62 a fortnight to \$143 a fortnight and the working credit limit value was increased from \$1000 to \$3500 for all youth allowance (other) recipients.
Clean Energy Advance (CEA)	2012	The Clean Energy Advance (CEA) was introduced in May 2012.
Clean Energy Supplement and other measures Clean Energy (Household Assistance Amendments) Act 2011	2012-2013	From 1 July 2013, the normal payment indexing arrangements and the Clean Energy Supplement (CES) began to deliver assistance related to carbon pricing. In addition, amendments were introduced for the Low Income Supplement, Essential Medical Equipment Payment, Single Income Family Supplement and aged care.
Family Tax Benefit and Youth Allowance Family Assistance and Other Legislation Amendment Act 2011	2012	The maximum age limit for a young person to qualify as a dependent child for Family Tax Benefit Part A (FTB-A) changed from aged under 25 to aged 21. This change aligns with the age of independence recognised in Youth Allowance. As at 1 January 2012, a young person is considered independent for Youth Allowance purposes once they turn 22.
Removal of the grandfathering provisions and other measures Social Security Legislation Amendment (Fair Incentives to Work) Act 2012	2013	Grandfathering provisions for some Parenting Payment recipients were removed. For certain Newstart recipients there were changes to the eligibility for certain supplements and allowances, and to income taper rates.
New Income Support Bonus Social Security and Other Legislation Amendment (Income Support Bonus) Act 2013	2013	The Act creates a new Income Support Bonus to be paid to recipients of Newstart Allowance, Youth Allowance, Parenting Payment, Sickness Allowance, Austudy Payment, Special Benefit, ABSTUDY Living Allowance, Exceptional Circumstances Relief Payment, Transitional Farm Family Payment.
Austudy	2013	The maximum length of temporary absence was reduced.
Age/study rules for children for family assistance payments Social Security and Other Legislation Amendment (2012 Budget and Other Measures) Act 2012	2013	The maximum age of eligibility for FTB Part A is further reduced to 17 for children who have completed secondary education or a vocational equivalent. Children still in secondary study can continue to access FTB Part A until the end of the calendar year they turn 19.
Child Care Rebate	2013	The government changed the eligibility criteria for Jobs, Education and Training Child Care Fee Assistance (JETCCFA) program. From 1 July 2013 parents who were studying an enabling course (commonly referred to as bridging or foundation courses) may be eligible for Jobs, Education and Training Child Care Fee Assistance. Changes to the amount of JETCCFA subsidy could impact the amount of CCR that a child is entitled to. There were changes to JETCCFA eligibility and subsidy rules in 2013, 2014 and 2015.
Disability Support Pension	Various	The tightening of eligibility criteria including, but not limited to, the 'Program of Support' rule in September 2011 and the revised Impairment Tables in January 2012.
	2014	From 1 July 2014, DSP recipients under age 35 years, granted between 1 January 2008 and 31 December 2011, are subject to review of their impairment (using the revised Impairment Tables) and capacity to work. People with a severe or manifest disability will not be reassessed. People who have some capacity to work now or in the future will be helped to do this through programmes, services and activities. Under this reform, recipients under 35 will have a participation plan which includes activities that will genuinely assist in labour market participation. These activities could include Work for the Dole, job search, work experience, education and training, and connection with Disability Employment Services.
Seniors Supplement Cessation Social Services and Other Legislation Amendment (Seniors Supplement Cessation) Act 2014	2014	The Budget 2014 – 15 measure on the cessation of the Seniors Supplement – Commonwealth Seniors Health Card holders commenced on 20 June 2015. The Seniors Supplement for Commonwealth Seniors Health Card (CSHC) holders will no longer be paid beyond the June 2014 quarterly payment. From this date CSHC holders will continue to receive only the Energy Supplement each quarter.

Amendment	Year Effective	Description
Child Care Rebate (indexation)	2014	In the 2010-11 Budget, the Child Care Rebate annual cap was reduced to \$7500 and indexation was paused for four years. This arrangement was due to cease on 30 June 2014. Under this measure, the pause in indexation will continue for the 2014-15, 2015-16 and 2016-17 financial years. For the income years 2014-15, 2015-16, 2016-17, CCR entitlement is calculated as 50% of out-of-pocket child care expenses up to a limit of \$7,500 (capped) per child per year for approved child care. The annual indexation is paused for a further 3 income years. The first indexation of the \$7,500 maximum limit is to occur on 1 July 2017.
Energy Supplement (ES) Social Services and Other Legislation Amendment (2014 Budget Measures No. 6) Act 2014	2014	In September 2014, The Energy Supplement (ES) replaced the CES and indexing was removed.
Austudy	2015	The residence requirements changed for Austudy in Jan 2015 and temporary absence is no longer included.
Student Start-up Loan (SSL) replaced the Student Start-up Scholarship (SSS) Labor 2013-14 Budget Savings (Measures No. 2) Act 2015	2016	For new recipients of Youth Allowance, Austudy and ABSTUDY who are in higher education full-time, the Student Start-up Loan (SSL) replaced the Student Startup Scholarship (SSS). SSL is a \$1,025 voluntary income contingent loan that can be paid twice per year at the beginning of each semester. SSS will be grandfathered for pre 1 January 2016 recipients and they will continue to receive it until they leave the student payment.

The following table contains the legislated future policy changes of which we are aware. These will take effect after the valuation date.

Table 63: Policy changes which will take effect after the valuation date

Amendment	Year	Description
Repeal of the income support bonus and the schoolkids bonus Minerals Resource Rent Tax Repeal and Other Measures Act 2014	2016	The final instalment of the Schoolkids Bonus will be paid in July 2016. The Income Support Bonus will continue until December 2016 with the last instalment paid in September 2016.
Changes to assets test Social Services Legislation Amendment (Fair and Sustainable Pensions) Act 2015	2017	From 1 January 2017, the pension assets test will be rebalanced. The assets test free areas will be increased to: <ul style="list-style-type: none"> \$250,000 for a single homeowner (an increase of \$48,000) \$375,000 for a homeowner couple (an increase of \$88,500) \$450,000 for a single non-homeowner (an increase of \$101,500) \$575,000 for a non-homeowner couple (an increase of \$142,000). The assets test "taper" (or withdrawal) rate for assets above the new free areas will be increased to 3.00 per fortnight for each extra \$1,000 in assessable assets (from the current rate of \$1.50, reversing the 2007 change). When announced in the 2015-16 Budget, the measure was to save \$2.4 billion across the forward estimates, the majority of which would be related to the Age Pension.
Cessation of Low Income Supplement Social Services Legislation Amendment (Low Income Supplement) Bill 2015	2017	The low income supplement will cease on 30 June 2017.
Changes to the parental means test Social Services Legislation Amendment (More Generous Means Testing For Youth Payments) Act 2015	2017	Treatment of Child Support maintenance income will be further reformed by applying a separate Maintenance Income Test, reducing payments for around 850 young people aged under 18. This test is similar to the one currently applying to Family Tax Benefit Part A.



Appendix B Data

Source data sets

The source administrative data includes:

- Entitlements data for regular payments, one-time payments and family tax benefit.

This information is captured on an episodic basis with records for each payment type provided to each person and details of the start date, end date and payment rates applying. These rates relate to the actual amounts that people were entitled to receive during the episode of entitlement, not the confirmed amounts that people did receive in the period. The payment types are identifiable through a combination of appropriation and payment type codes.

- Characteristics data for a large number of different characteristics.

This information relates to the individual characteristics of payment recipients with data items being captured as relevant for each payment type. It is captured at the point of application for payments and updated as new information is received.

Manipulation of the data

A number of the tables from the longitudinal administrative data have been used to construct a consolidated longitudinal modelling data set to support the actuarial analysis. This consists of one record for each person for each financial year during which they are in the payment system, and each financial year subsequent to their death or exit from the system. The records reflect the information for a financial year and contain:

- A unique but confidentialised identifier for each person
- Details of a number of static variables (e.g. date of birth) for the individual
- Details of a selected number of the individuals characteristics as at 30 June each year
- Details of the entitlements paid over the financial year mapped to the payment types proposed for modelling purposes
- A number of derived variables for use in modelling (e.g. model class, duration in class, age pension qualifying date).

This is the primary data source used to develop information for people currently in receipt of Commonwealth welfare payments and for people who have recently exited the system.

In providing the data used in this project, the Department scrambled the personal identifier attached to each record as well as excluding certain information such as names, detailed address information, and Australian Business Numbers.

Mapping of payment entitlements

The payment data provided by the Department includes information whose purpose is explained through a combination of 3 codes of which there are circa. 2,055 combinations.

PwC have worked together with the Department's staff to map these codes into a number of payment types for consideration for modelling. There are around 100 payment types that were considered in this process.

Data items included for baseline valuation

The construction of this longitudinal modelling dataset was a very substantial task in itself. The format of the source data was such that each variable included needed to be developed on a stand-alone basis before being compiled into the main dataset. Variables also needed to be assessed for completeness and grouped into sensible levels for modelling.

For the baseline valuation we focussed the data development on developing the entitlement data and a limited number of key characteristic variables which were identified as important for modelling purposes. For the 2016 valuation, the Department controlled the data development and a few agreed variables were added to enhance the modelling.

Reconciliation and validation of data

The information extracted from the administrative data suite has not been audited by PwC.

We have however undertaken a high level reconciliation of the payments and examined the information for internal consistency prior to its use. The reconciliation covered the last five years of payments and checked the payment information extracted against the Department's financial reporting information. At an overall level the data reconciled within 0.5% for all years except 2015/16. For 2015/16 the majority of the difference is explained by timing differences related to the Family Tax Benefit.

For the baseline valuation, we worked with staff from the Department to perform quality assurance checks on the process of extracting and manipulating the data. Any issues identified through this process were resolved prior to the data being used for developing the valuation results. We understand that the additional variables added into the 2016 dataset underwent a similar quality assurance process. The Department has indicated that it will undertake further validation and assurance work in relation to the ongoing validation of data.

Data limitations

The data, though extensive, has a number of limitations, and we highlight below a number of important observations in this regard:

- Reliability:
 - The Department's data is only updated when welfare recipients provide new information as part of the process of applying for payments, and various fields may therefore not be up to date.
 - Many of the variables are self-reported and as such may be subject to errors or issues arising from misunderstanding the information being sought.
 - As noted above, a subset of the Department's data is known to be immaturely developed due to the 'as known as' date being 30 June 2016. Whilst the selected valuation methodology compensates for the major maturity issues, it is not possible to make adjustments to reflect all of the potential areas where the data matures. In particular there may be a small number of people who are not recorded within the current welfare recipient population who are later identified as having received an entitlement during the most recent year and hence falling within one of the current welfare recipient classes.
- Completeness:
 - Some variables are only available for subsets of the welfare recipient population as they are only relevant to certain payment types. As an example, level of educational attainment is only available for some welfare recipients.
 - Other variables are missing, even where relevant, for example, Indigenous status.
- Limitations of Census CURF data:
 - This data contains a limited number of variables and some of these are defined in a broad way (e.g. age band rather than age). Whilst we have attempted to overcome these limitations through the modelling it would be preferable to have a greater level of detail in the source data.
- Data information and controls:
 - The longitudinal data suite that has been developed recently to support this project and is still in its infancy. This means that there is a greater chance that features of the data are less well understood than would be the case if it had been established and in use for an extended period of time.
 - We understand that the Department has mitigated this risk through independent validation of the coding of data extraction and upload processes. As noted above the PwC team has worked with staff from the Department to reconcile the data and undertake quality assurance checks on samples against source information. Notwithstanding, there remains an opportunity to develop more formal and comprehensive control processes for the longitudinal data suite.
 - Over time, as the project progresses and as we continue to work closely with the Department, we will gradually develop a fuller understanding of the control processes supporting the extraction of data. This may lead to improvements being made to the information within the longitudinal data suite and our interpretation and use of it.

Appendix C Model validation

Overview

The core model was originally developed for the baseline valuation as at 30 June 2015. As the model is further developed and used, model validation will continue to be an essential role. Our approach to validating the model and mitigating the risks combines the use of an appropriate set of checks and the model use by a team with the appropriate skills and experience.

As this is the second year in which the model has been used, a reconciliation has been carried out between the June 2015 lifetime cost and the June 2016 lifetime cost and this is a further important validation. We discussed the results of this reconciliation in section 7.2. We have also put a particular emphasis on the validation of areas in which the model has been refined, as this is a key area of risk.

Model validation processes

In developing the models we have mitigated the risks through first developing the methodology, then a simple version of the model with a simpler 'foundation' set of assumptions and finally the full risk based model. At each stage of work the analyses undertaken have been subject to PwC's standard quality control processes which include review of all work products by a qualified actuary. All the elements of the method have also been discussed by the senior members of the project team and have been subject to review from PwC's second partner and from senior members of staff from Data Analysis Australia.

Throughout these stages we have discussed the emerging analyses and selected assumptions with the Department and where appropriate additional investigations have been undertaken by staff from either PwC or the Department to assist in understanding and interpreting the observed experience.

The suite of computer programs used to implement all the statistical elements of the assumption development have been subject to technical review by both PwC staff and senior members of staff from Data Analysis Australia. A comprehensive set of checks has been used in developing the model assumptions and to validate the overall results. Firstly checks were used to validate each module and then to validate the overall model and results. Sensitivity checks have also been used in order to help understand and validate the model behaviour.

A summary of the checks used is provided below.

Table 64: Summary of model validation checks

Module	Description
Population	Check of composition vs. demographic projections
Flow assumptions	Check on projected deaths vs. demographic projections
	Check on projected partner status profile by age
	Check on projected education status profile by age
	Check on projected child numbers by parent
	Check on projected child numbers by age of child
	Check on projected payment type (classes 1, 2, 3)
	Check on employment earnings indicator (classes 1-5)
	Check on primary care recipient age, relationship to carers and medical condition category (class 4)
	Check on number of adult care recipients and number of child care recipients (class 8)
Check on DSP medical condition category (class 5)	
Welfare class movement assumptions	Check on projected profiles of numbers and proportions of people by class and age
	Comparison of quality of fit vs. foundation assumptions
	Checks on projected numbers of new entrants by class
	Checks on projected numbers of exits by class

Module	Description
Payment category utilisation and size assumptions	Checks on selected payment utilisation assumptions for each payment category vs. past experience
	Checks on selected payment size assumptions for each payment category vs. past experience
	Statistical goodness of fit tests
	Comparison of quality of fit vs. foundation assumptions
	Checks on combined effect of utilisation and size assumptions both vs. past experience and projected
Indexation assumptions	Checks on application of indexation assumptions
Results module / overall model	Reconciliation of movements in lifetime cost from June 2015 to June 2016
	Comparison between foundation and risk based models and examination of reasons for differences
	Sensitivity testing of key assumptions

All issues identified through these validation processes were investigated and responded to in selecting the final assumptions to use in the model. Where these assumptions differ at an overall level from past observed experience this was as intended and the differences can generally be explained by assumptions selected to reflect past or expected future changes in policy, eligibility criteria or payment levels.

As a final quality control an independent PwC actuary performed an internal peer review of key elements of the model.

External model validation

The Department has also engaged the University of Queensland’s (UQ) Institute for Social Science Research (ISSR), in partnership with Deloitte, to validate the first two actuarial valuations in order to gain further assurance around this work. This work is in progress.



Appendix D Model factors

The tables below summarise the characteristics that are considered within each of the key sets of model assumptions.

Flow assumptions

Table 65: Factors considered in flow assumptions

Individual Characteristics Used	Mortality	Partnering status	Gaining children	Losing Children	Education attainment
Age	Y	Y	Y	Y	Y
Gender	Y	Y	Y	Y	Y
Class	Y	Y	Y		Y
Previous class		Y	Y		Y
Partner status		Y	Y	Y	Y
Number of dependent children		Y	Y		Y
Age of dependent children		Y	Y	Y	Y
Highest level of education attained		Y	Y		Y
Duration in current family situation / education level					Y
Duration in welfare class / system		Y			Y
Place of Birth / Languages Spoken		Y	Y		Y
Indigenous status	Y	Y	Y		Y
Primary medical condition	Y				

Class movement assumptions

Table 66: Factors considered in class movement assumptions for Classes 1-6

Individual Characteristics Used	1 Studying	2 Working Age	3 Parents	4 Carers	5 Disability Support	6 Pension Age
Age	Y	Y	Y	Y	Y	Y
Gender	Y	Y	Y	Y	Y	Y
Class	Y	Y	Y	Y	Y	Y
Previous class	Y	Y	Y	Y	Y	
Partner status	Y	Y	Y	Y	Y	
Number of dependent children	Y	Y	Y	Y		
Age of dependent children	Y	Y	Y	Y		
Highest level of education attained	Y	Y				
Duration in welfare class / system	Y	Y	Y	Y	Y	
Place of Birth / Languages Spoken		Y	Y	Y	Y	
Indigenous status	Y			Y		
Previous welfare utilisation	Y	Y	Y	Y	Y	
Earnings indicator	Y	Y	Y	Y	Y	
Payment type	Y	Y	Y			
Care recipient information						
Primary medical condition					Y	

Table 67: Factors considered in class movement assumptions for Classes 7-12

Individual Characteristics Used	7 Non-IS Family	8 Non-IS Carer	9 Non-IS Other	10 Prev Welfare Recipient	11 Dead	12 Rest of Aust. Pop
Age	Y	Y	Y	Y	N/A	Y
Gender	Y	Y	Y	Y	N/A	Y
Class	Y	Y	Y	Y	N/A	Y
Previous class	Y	Y	Y	Y	N/A	
Partner status	Y	Y	Y	Y	N/A	Y
Number of dependent children	Y	Y	Y	Y	N/A	Y
Age of dependent children	Y	Y	Y	Y	N/A	Y
Highest level of education attained				Y	N/A	Y
Duration in welfare class / system	Y	Y	Y	Y	N/A	
Place of Birth / Languages Spoken	Y	Y	Y		N/A	
Indigenous status	Y	Y	Y	Y	N/A	Y
Previous welfare utilisation	Y		Y		N/A	

Class characteristic variable assumptions

The assumption approaches adopted for each class characteristic variable are summarised below. Risk models were adopted where there were significant differences in behaviour between individuals based on characteristics not captured in the foundation models.

Table 68: Approaches and factors used in class characteristic variable assumptions

Model	Primary Care Recipient Age	Primary Care Recipient Relationship	Primary Care Recipient Medical Condition	Primary Medical Condition	Number of Child Care Recipients	Number of Adult Care Recipients	Earnings Indicator	Earnings Indicator	Paymt Type	Paymt Type	Paymt Type
Class	4	4	4	5	8	8	1,2	3,4,5	1	2	3
Variables Used											
Age	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Gender	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Class	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Partner Status							Y			Y	Y
Number of Dependent Children							Y			Y	
Age of Dependent Children							Y			Y	
Highest Education Level Obtained							Y			Y	
Indigenous Status							Y		Y	Y	
Previous Class	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Duration in Class							Y				
Primary Care Recipient Age	Y	Y	Y								
Number of Adult Care Recipients						Y					
Number of Child Care Recipients					Y	Y					
Earnings							Y	Y		Y	
Payment Type							Y		Y	Y	Y

Notes:

1. The factors shown are for the initial determination of the variable when people first enter the relevant class. In subsequent years some variables are modelled dynamically and others are treated as static. The report provides further information for each variable.

Payment category utilisation assumptions

The assumption approaches adopted for utilisation of each payment category for people in each class are summarised below. As noted in section 6, foundation assumptions were adopted in a number of cases due to the relatively low volume of related payments in the class-category combination and therefore the limited value in developing a risk-based model for that category and class. The risk based assumptions cover 98% of the income support payments and 60% of overall payments.

Table 69: Approach adopted for developing payment utilisation assumptions for each class: Income Support payment categories

Model class (at t+1)	A IS Studying	B IS Working	C IS Parents	D IS Carers	E IS Disability	F IS Aged	G IS Dependant
1 Studying	R*	F*	F*	F*	F*	F*	F*
2 Working Age	F*	R**	F*	F*	F*	F*	R**
3 Parents	F*	F*	R*	F*	F*	F*	F*
4 Carers	F*	F*	F*	R*	F*	F*	F*
5 Disability Support	F*	F*	F*	F*	R*	F*	F*
6 Pension Age	F*	F*	F*	F*	F*	R*	F*
7 Non IS Family	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8 Non IS Carer	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9 Non IS Other	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10 Previous welfare recipients	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11 Dead	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12 Rest of Aust. population	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

- R* indicates where the assumption is 100% and hence that no risk based model was required to model utilisation accurately.
- R** indicates where the assumption is less than 100%, but rules were developed to assign utilisation (rather than fitting models)
- For category G the individuals receiving dependents payments have been identified and treated as a closed group in the model.
- F* indicates where refined foundation assumptions have been used, referencing both current and previous class. In these cases we consider the additional value of risk based utilisation assumptions to be minimal

Table 70: Approach adopted for developing payment utilisation assumptions for each class: Non-Income Support.

Model class (at t+1)	H FTB	I Family	J New Parents	L Health & Disability	M Carer	N Study & Skills	O Remote & Regional	P General Allowances	Q All Other	R Rent Assistance
1 Studying	F	F	F	F	F	RD	F	F	F	F
2 Working Age	RG	RG	RG	F	F	F	F	F	F	RG
3 Parents	RG	RG	RG	F	F	F	F	F	F	RG
4 Carers	F	F	F	F	F	F	F	F	F	F
5 Disability Support	F	F	F	RD	F	F	F	F	F	F
6 Pension Age	F	F	F	F	F	F	F	F	F	F
7 Non IS Family	RG	RG	RG	F	N/A	F	F	RD	F	RG
8 Non IS Carer	F	F	F	F	R*	F	F	F	F	F
9 Non IS Other	RG	RG	RG	F	N/A	F	F	F	F	F
10 Previous welfare recipients	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11 Dead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12 Rest of Aust. population	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

- RG indicates risk based assumptions are used, fitted using a generalised linear model.
- RD indicates risk based assumptions are used, fitted using a decision tree.
- F indicates Foundation assumptions have been used

Through applying these approaches the factors considered for utilisation of the income support and other payment categories are as follows. Where foundation assumptions have been used for some classes and risk based assumptions for others, the table shows the factors in the risk based assumption set.

Table 71: Factors considered in payment utilisation assumptions – income support payments

Individual Characteristics Used	A IS Studying	B IS Working Age	C IS Parents	D IS Carers	E IS Disability	F IS Aged	G IS Dependent
Age	Y	Y	Y	Y	Y	Y	
Gender	Y	Y	Y	Y	Y	Y	
Class	Y	Y	Y	Y	Y	Y	Y
Previous class	Y	Y	Y	Y	Y	Y	
Payment type							Y

Table 72: Factors considered in payment utilisation assumptions – other payments

Individual Characteristics Used	H FTB	I Family	J New Parents	L Health & Disability	M Carer	N Study & Skills	O Remote & Regional	P General Allowances	Q All Other	R Rent Assistance
Age	Y	Y	Y	Y	Y	Y	Y		Y	Y
Gender	Y	Y	Y		Y		Y	Y	Y	Y
Class	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Previous class	Y	Y	Y							
Partner status	Y	Y	Y							Y
Number of dependent children	Y	Y	Y							Y
Age of dependent children	Y	Y	Y							Y
Highest level of education attained						Y				Y
Duration in welfare class / system	Y	Y	Y			Y				Y
Previous welfare utilisation	Y	Y	Y	Y		Y		Y		Y
Payment type	Y	Y	Y			Y				
Primary medical condition				Y						
Earnings indicator	Y	Y	Y	Y						Y
Indigenous status										Y

Payment category amount assumptions

The approaches adopted for each payment category for each class are summarised below; these are applied for people who utilise a payment. The risk based assumptions cover 98% of the income support payments and 86% of overall payments.

Table 73: Approach adopted for developing payment assumptions for each class: Income support.

Model class (at t+1)	A IS Studying	B IS Working Age	C IS Parents	D IS Carers	E IS Disability	F IS Aged	G IS Dependent
1 Studying	RG	F	F	F	F	F	F
2 Working Age	F	RG	F	F	F	F	RD
3 Parents	F	F	RG	F	F	F	F
4 Carers	F	F	F	RD	F	F	F
5 Disability Support	F	F	F	F	RD	F	F
6 Pension Age	F	F	F	F	F	RG	F
7 Non IS Family	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8 Non IS Carer	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9 Non IS Other	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10 Previous welfare recipients	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11 Dead	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12 Rest of Aust. population	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

- RG indicates risk based assumptions are used, fitted using a generalised linear model.
- RD indicates risk based assumptions are used, fitted using a decision tree.
- F indicates Foundation assumptions have been used

Table 74: Approach adopted for developing payment assumptions for each class: Non-Income support

Model class (at t+1)	H FTB	I Family	J New Parents	L Health & Disability	M Carer	N Study & Skills	O Remote & Regional	P General Allowances	Q All Other	R Rent Assistance
1 Studying	F	F	F	F	F	F	F	F	F	F
2 Working Age	RG	F	F	F	F	F	F	RL	F	F
3 Parents	RG	RG	F	F	F	F	F	RL	F	F
4 Carers	F	F	F	F	F	F	F	RL	F	F
5 Disability Support	F	F	F	F	F	F	F	RL	F	F
6 Pension Age	F	F	F	F	F	F	F	RL	F	F
7 Non IS Family	RG	RG	F	F	N/A	F	F	F	F	F
8 Non IS Carer	F	F	F	F	F	F	F	F	F	F
9 Non IS Other	F	F	F	F	N/A	F	F	F	F	F
10 Previous welfare recipients	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11 Dead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12 Rest of Aust. population	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

- RG indicates risk based assumptions are used, fitted using a generalised linear model.
- RL indicates risk based assumptions are used, by applying a loading to the main income support payment type.
- F indicates Foundation assumptions have been used

Through applying these approaches the factors considered for payments under income support and other payment categories are as follows. Where foundation assumptions have been used for some classes and risk based assumptions for others, the table shows the factors in the risk based assumption set.

Table 75: Factors considered in payment assumptions – income support payments

Individual Characteristics Used	A IS Studying	B IS Working Age	C IS Parents	D IS Carers	E IS Disability	F IS Aged	G IS Dependent
Age	Y	Y	Y		Y	Y	Y
Gender	Y	Y	Y			Y	
Class	Y	Y	Y	Y	Y	Y	Y
Previous class	Y	Y	Y			Y	
Partner status	Y	Y	Y	Y	Y	Y	Y
Number of dependent children		Y	Y				
Age of dependent children		Y	Y				
Highest level of education attained	Y	Y					
Duration in welfare class / system	Y	Y	Y	Y	Y	Y	Y
Indigenous status		Y					
Previous welfare utilisation		Y	Y	Y	Y		Y
Payment type	Y	Y	Y				Y
Earnings indicator	Y	Y	Y	Y	Y		Y

Table 76: Factors considered in payment assumptions – other payments

Individual Characteristics Used	H FTB	I Family	J New Parents	L Health & Disability	M Carer	N Study & Skills	O Remote & Regional	P General Allowances	Q All Other	R Rent Assistance
Age	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Gender	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Class	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Previous class	Y									
Partner status	Y	Y								
Number of dependent children	Y	Y								
Age of dependent children	Y	Y								
Highest level of education attained	Y	Y								
Duration in welfare class/ system	Y	Y								
Indigenous status	Y	Y								
Previous welfare utilisation	Y	Y								
Earnings indicator										

Appendix E Glossary

Glossary A to M

Actuarial Valuation

Estimation of the lifetime cost to the Australian government of future social security payments using generally accepted actuarial principles.

Allowances

Allowances provide income support and access to a range of concessions for eligible Australians. The term Allowance is used by the Department to refer to income support payments that are generally at lower payment levels than Pensions.

Assumptions

Assumptions are the parameters that guide the model - these include 'macro' assumptions such as economic forecasts and demographic assumptions; and 'micro' assumptions such as probabilities of individuals moving into and through the welfare system based on various risk factors.

Group

In this report we have used the term group to refer to a group of people defined by a set of common characteristics in the model - for example, a group could be "females aged 20 to 24 who were in welfare class 'studying' in 2014/15" or could be "male carers". Generally, groups will be defined by the model structure and individual's characteristics.

Data

Data refers to sets of information that are being used to inform the project.

Datasets

A set of values of qualitative (characters) or quantitative (numbers) variables that is data coded in a form suitable for using in analysis.

Discounting

The process of determining the present value of a payment or a stream of payments that is to be received in the future. Given the time value of money, a dollar is worth more today than it would be worth tomorrow given its capacity to earn interest.

Dynamic

A term we are using to describe information or data variables that change with the progression of time (e.g. a person's partner status).

Flow assumptions

This comprises the set of assumptions used to ascertain how each person's individual demographic and risk characteristics change as time progresses.

Indexation

Indexation is a technique to adjust payments by means of an index, in order to maintain the purchasing power of the payment after inflation.

Liability

In Finance, the term liability is used to refer to general obligations to make future payments. The specific meaning varies depending on the person using the term and context of its use. Actuaries may also use this term to describe the net present value of the cash flows arising from future obligations.

Lifetime cost

For the investment model, the lifetime cost will be the net present value of all future welfare payments (to the in-scope population).

Average lifetime Cost (future)

The net present value of the payments that we expect to be made to an individual over their future lifetime. Note that these will be assessed for groups of similar individuals, not for specific people.

Method

The method refers to the description or specification of the process for selecting modelling techniques, taking the data, analysing it, developing or incorporating assumptions about the future, and projecting forward and summarising the expected welfare payments for each individual within the model population.

Model

The model refers to the set of computer programs, spreadsheets, formulae, techniques and tools that are being built to apply the method. In a sense, the model is intended to represent, in a mathematical way, what happens to people as they move in, through and out of the social support system based on various assumptions. The model is a collection of modules and sub-components that fit together in applying the method.

Model population

The model population is the set of individual person records used in the model. The model design allows the model to be run for either a sample of the population or the whole population. Where the model is run for the entire model population, and not a sample, we refer to this as the full population.

Glossary N to Z

Net Present Value

The sum of the present values of incoming and outgoing cash flows over a period of time.

Payment

A generic term used to describe all the different types of benefits which an individual can be paid. Includes Pensions, Allowances, Entitlements etc.

Payment assumptions

The assumptions which describe the payments which individuals receive given that they use a specific Payment category.

Payment categories

The groupings of individual payment types used for modelling purposes.

Payment types

A term used to describe the labels which have been assigned to all the underlying payments so they can be considered for modelling purposes. The assignment has been through a mapping process with around 2,000 underlying payments being identified by codes and these mapped to around 100 payment types.

Payment utilisation assumptions

The assumptions which describe the probabilities with which individuals use different Payment categories.

Pensions

Pensions provide income support and access to a range of concessions for eligible Australians. The term Pension is used by the Department to refer to income support payments that are generally at higher payment levels than Allowances.

Present Value

The present value is the value of an expected income stream determined as of the date of valuation. The present value is always less than or equal to the future value because money has interest-earning potential, a characteristic referred to as the time value of money.

Probability

Probability is the measure of the likelihood that an event will occur. Probability is quantified as a number between 0 and 1 (where 0 indicates impossibility and 1 indicates certainty). The higher the probability of an event, the more certain we are that the event will occur.

Projection

The use of the model to forecast the future payment experience of the population based on current statistics and trends.

Risk characteristics

Measurable or observable factors or characteristics that are used to assign each individual to one of the risk classes of a risk classification system. Examples of risk characteristics in the context of the actuarial valuation model include age, gender, family situation and education status.

Risk classes

A set of risks grouped together under a risk classification system.

Risk classification system

The process of systematically arranging risks into groups or categories according to similar risk characteristics.

Risk factors

See risk characteristics.

Simulation

Simulation is the imitation of the operation of a real-world process or system over time. In the context of the actuarial valuation model, we will simulate how the payment system operates. Where the system is stochastic, multiple simulations may be used to show the range of possible outcomes.

Static

A term we are using to describe information or data variables that do not change over time. (e.g. a person's date of birth or country of birth).

Statistics

The study of the collection, analysis, interpretation, presentation, and organisation of data.

Stochastic

The term stochastic describes events or systems that are unpredictable due to the influence of random variables. A stochastic model will not produce the same output from a given starting condition or initial state even if run in the same way.

Valuation

see Actuarial Valuation

Valuation Date

The reference date for the actuarial valuation. The valuation will consider the lifetime cost as at the valuation date for all payments after the valuation date.

Valuation Results

The summarised outputs from the model, which will be tailored to meet the needs of different users – for example, as well as the total reported lifetime cost, results may include average lifetime cost estimates for particular groups, projected payments for each of the next five years, projected numbers of “new entrants” to the social support system from different population segments.

Welfare class

The assignation of people into unique segments used within the model. There are 12 classes: 6 for income support recipients (studying, carers, etc.), 3 for people receiving payments but no income support and 3 for the rest of the population. Each person is assigned to the single most appropriate category for each financial year.

Welfare class assumptions

The assumptions which describe the probabilities with which individuals move between welfare classes.

Welfare utilisation assumptions

A term covering both the Welfare class and Payment utilisation assumptions.

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