Australian Federation of Disability Organisations

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NATSEM at the University of Canberra

INEQUALITIES IN STANDARDS OF LIVING: EVIDENCE FOR IMPROVED INCOME SUPPORT FOR PEOPLE WITH DISABILITY

REPORT PREPARED FOR
THE AUSTRALIAN FEDERATION OF DISABILITY ORGANISATIONS

BY JINJING LI, LAURIE BROWN, HAI ANH LA, RIYANA MIRANTI AND YOGI VIDYATTAMA
NATSEM AT
THE INSTITUTE FOR GOVERNANCE AND POLICY ANALYSIS,
UNIVERSITY OF CANBERRA

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IGPA Director: Professor Laurie Brown
NATSEM Director: Professor Robert Tanton

NATSEM at The Institute for Governance and Policy Analysis
University of Canberra, ACT 2601, Australia
Building 24, University Drive South, Canberra ACT 2617

PHONE: + 61 2 6201 2074
EMAIL: ucigpa@canberra.edu.au
TWITTER @NATSEM_UC and @UCIGPA
WEBSITE: https://www.governanceinstitute.edu.au/centres/national-centre-for-social-and-economic-modelling-natsem

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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AUTHOR NOTE

Authors of this report are:

Associate Professor Jinjing Li, NATSEM, University of Canberra
Professor Laurie Brown, Director IGPA, University of Canberra
Dr Hai Anh La, NATSEM, University of Canberra
Associate Professor Riyana Miranti, NATSEM, University of Canberra
Dr Yogi Vidyattama, NATSEM, University of Canberra

ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACOSS	Australian Council of Social Service
AFDO	Australian Foundation of Disability Organisations
ASGS	Australian Statistical Geography Standards
AP	Age Pension
CRPD	United Nations Convention on the Rights of Persons with Disabilities
CV	Compensating Variation
DSP	Disability Support Pension
DSS	Department of Social Services
HES	Household Expenditure Survey
HH	Household
IGPA	Institute for Governance and Policy Analysis
JCA	Job Capacity Assessment
NATSEM	National Centre for Social and Economic Modelling
NDIS	National Disability Insurance Scheme
NDS	National Disability Strategy
NSA	Newstart Allowance
SA2	Statistical Areas Level Two
SDAC	Survey of Disability, Ageing and Carers
SoL	Standard of Living

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EXECUTIVE SUMMARY

INTRODUCTION

Links between disability and education, employment and income are clearly apparent in Australia. People with disability are at a much higher risk of falling into lower-income groups than persons without disability. This has not only been observed for those of working age but also among the elderly. The financial difficulties faced by people with disability have been recognised by governments around the world who provide cash benefits as income support to individuals and families with disability. In Australia, people who have a disability and are aged between 16 years and the age pension age are eligible for the social security benefit "the Disability Support Pension" (DSP). This is a means-tested payment subject to an individual's capacity to work assessment. There are approximately 2 million Australians aged between 16 and 64 years who report having a mild to profound disability but only 35% receive the DSP.

In the May 2005 federal budget, the Government announced a measure that people with disability who apply for income support after 1 July 2006 and who can work between 15 and 29 hours a week at award wages would be placed on the Newstart Allowance (NSA) (or Youth Allowance) rather than the DSP. Since 2006, these individuals have become known as the 'partial capacity to work' group of beneficiaries. However, the NSA provides a significantly lower benefit and has a more stringent income test. Since 2006, eligibility for the DSP was further tightened in 2012 and 2014-15.

NATSEM modelling of the 2006 budget measure suggested that the living standards of people with disability could be cut by up to 31% compared with the tax and transfer system in 2005. As Soldatic and Sykes (2017) comment, the relationship between disability and poverty is extremely complex but it is clear that a significant number of Australians with disability and their families are now living in poverty.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) (UN, 2008), and Australia's National Disability Strategy (NDS) (COAG, 2011) call for income support to be provided to people with disability through policy instruments such as the DSP. The purpose of the CRPD and NDS are to promote an enhanced quality of life for people with disability and their carers including opportunities for people with disability to fully and effectively participate in all aspects of economic, social and political life, opportunities to live independently and actively engage in their communities, as well as families and carers being well supported.

It is now 13 years since the welfare-to-work change to the DSP was first introduced in 2006. While the DSP remains the main social security payment for working-aged individuals with disability, the evidence base on the impact of policy changes to the DSP since 2006 on the financial well-being of many Australian families is lacking. Are households with family members with disability on the DSP (or NSA) at increased risk of financial insecurity, poverty and lower living standards compared with households where no family member has disability? To what extent do current levels of income support protect households reliant on the DSP as their main source of income from financial insecurity and poverty? If there are major gaps in the living standards of households with and without members with disability, then what level of income support is required through the DSP to substantially reduce these inequities? What impact would broadening the eligibility criteria for the DSP e.g. allowing people with disability now on the lower NSA to be included back on the DSP, have on the financial wellbeing of people with disability and their families? This Report attempts to answer these key policy issues.

This Report is set within the social model of disability in which society's attitudes, choices, practices and structures hinder people with disability from enjoying full and effective economic participation, social inclusion and equality. Barriers are not the inevitable result of an individual's impairment i.e. a long-term limitation in a person's physical, sensory, mental or intellectual

functioning (the medical model of disability) (Terzi, 2004; COAG, 2011; Davis, 2013; Oliver, 2013; Soldatic and Sykes, 2017; Retief and Letsosa, 2018). Rather the social model of disability draws attention to the interaction between an individual's perceived or actual impairment and the disabling barriers that hinder people from participating in society (Devandas Aguilar, 2017).

In this Report the 'cost of disability' is defined as the inequality in the standard of living (SoL) experienced by persons with disability and their families rather than the direct and indirect costs incurred through the 'disability' itself (Retief and Letsosa, 2018). Lower standards of living typically arise because of the interaction between the person's impairment and the barriers they and their family face in participating in society. A SoL method assesses inequalities based on the income gap between households with and without a member with disability and the amount of income needed to ensure both households have the same SoL. In other words, how much extra income is required by households with an adult member with disability to achieve the same SoL of matched households but who do not have a member with disability.

OVERVIEW OF THE DISABILITY SUPPORT PENSION

In Australia, DSP is the main direct cash benefit for people with disability of working age. The benefit rate, income and asset tests for the DSP and Age Pension are similar but higher than allowance payments, such as NSA. To qualify for the DSP, a person with disability must meet the age eligibility criteria, residency rules, have permanent physical, intellectual or psychiatric impairment, and meet income and assets tests. To meet the medical rules, the applicant must prove that his/her health condition is equivalent to at least 20 points on pre-determined Impairment Tables. These tables are designed to assess people's impairments in relation to their capacity to work.

For those who are eligible given their impairment rating, the amount of the DSP payment they can receive depends on their age, marital status, income and assets. As at 20 March 2019, for eligible people aged 21 years or over, the maximum fortnightly DSP rate (including the basic rate, pension supplement and energy supplement) was $926.20 for a single person and $698.10 for a member of a couple. With an estimated budget of $16.7 billion in 2018-19, the DSP is the second largest welfare program of the Australian Government, only the Age Pension being larger. Out of a total social security and welfare budget around 28.9% is spent on the Age Pension and 10.6% on the DSP (see Singh and Sharma 2018).

Data from the Department of Social Services (DSS, 2018) shows that in December 2018 there were 750,045 recipients of the DSP - 399,603 (53.3%) of whom were men and 350,442 (46.7%) were female. Most DSP recipients were single (578,399 persons or 77.1%) with 171,646 (22.9%) being partnered. There were 49,035 people receiving the DSP who self-identified as Aboriginal, Torres Strait Islander or South Sea Islander. This suggests that Indigenous Australians are two and a half times more likely to be on the DSP than non-Indigenous Australians, reflecting both a higher prevalence of disability as well as significantly higher rates of unemployment and socio-economic disadvantage (Soldatic, 2018; Soldatic, 2018a). The number of new DSP recipients per year has decreased markedly from 89,000 in 2009–10 to around 32,000 in 2016–17. The rate of successful DSP claims has also declined substantially from 69% in 2010-11 to 40.6% in 2013-14 and 29.8% in 2017-18. The average duration DSP recipients spend on the DSP income support payment is 688 weeks or around 13 years.

The tightening of the eligibility criteria for DSP has led to a significant transition of recipients from receiving the DSP to the NSA which is paid at a lower rate. At December 2014 there were 153,582 individuals in the partial capacity to work group receiving the NSA, representing 21.1% of all NSA recipients. By December 2018 this number had grown by 30.2%, reaching almost 200,000 Australians. Those classified as having a 'partial capacity to work' now account for 28% of all NSA recipients.

DATA AND METHODS

Data from the ABS 2015–16 Household Expenditure Survey (HES) is used to carry out the Report analyses. The ABS defines disability as any limitation, restriction

or impairment which restricts everyday activities and has lasted, or is likely to last, for at least six months. In the Report a household having a member with disability is defined as one that has at least one adult member (individual aged ⩾ 16 years) self-reporting as having any long-term limitation in a core activity. Households are further classified into those where the family member has either mild and moderate disability or severe and profound disability. In 2015-16 some 2.75 million Australian households (28.7%) had at least one adult with disability – 989,000 households had a family member with severe or profound disability and 2 million had a family member with mild or moderate disability - nearly 20% of these households had 2 or more family members with disability. One in five households with an adult member with mild or moderate disability had a member receiving the DSP and fewer than half (46%) of those with a family member with severe or profound disability.

Household weekly disposable income is used as the income measure and a composite Index of Standard of Living was constructed using 16 variables reflecting households' risk of financial insecurity and hardship such as 'went without meals due to shortage of money, couldn't pay fuel/telephone bill on time due to money shortage, or couldn't raise $2000 within a week for an emergency'.The cost of disability is estimated by calculating the difference between the 'actual' income of households having an adult member with disability and an 'expected' income. The expected income is the income of 'counterfactual' matched households that have the same characteristics of the families with an adult member with disability but none of their adults have disability. This approach is a standard economic method known as 'Compensating Variation' (CV) in income. Thus, the cost of disability is how much extra income do households with an adult with disability need to be compensated to achieve the same standard of living. The findings of the modelling are uprated to 2019 to make them current.

POLICY OPTION SCENARIO MODELLING

NATSEM's microsimulation model STINMOD+ was used to simulate the distributional impact in 2019 of two policy options:

1. DSP payments are increased to offset some but not all of the cost of disability. Because of budgetary implications, the gap in standard of living of households of recipients of the DSP compared with households without an adult member with disability is on average halved. To achieve this the DSP is increased by $100 per fortnight for a single person and $310 per fortnight for a couple in a household. There is no change to the DSP eligibility criteria, so the number of DSP recipients remains largely unchanged; and
2. The disability income support scheme is expanded whereby some people who have a disability but who are not currently DSP recipients become eligible. The number of additional beneficiaries is constrained to ensure the total budgetary impact is the same as for option 1. The number of recipients could be increased by relaxing the DSP eligibility criteria, including allowing individuals with a partial capacity to work to shift back from the NSA to the DSP. For simplicity in the modelling, individuals in the HES with similar characteristics to existing DSP beneficiaries were selected to become recipients until the cost of the DSP matched option 1.

The first policy option is the primary focus in the Report. However, given the current public debate over the inadequacy of and need to raise Newstart (Deloitte Access Economics, 2018), largely because of the increasing number of people on NSA living in poverty, the second proposal offers an alternative policy option which has comparable implications on Government fiscal resources.

FINDINGS

Financial Insecurity and Hardship

Households with a member with disability and receiving either the DSP or NSA are much more likely to experience financial hardship and insecurity compared with all Australian households (all HHs) or households with a member with disability receiving the age pension (AP) (Table 1a). The proportion of families with a DSP recipient answering 'yes' to the 16 questions was at least double that of all Australian households on 12 of the 16 indicators, and 3 or more times higher on 3 indicators. Households with an adult with disability and on Newstart

(NSA) or Aboriginal and Torres Strait Islander households with a member receiving the DSP (Indigenous DSP) are at even higher risk. The proportion of NSA households was more than twice all Australian households on 15 of the 16 indicators and 3 or more times higher on 12 indicators, and Indigenous DSP households more than double on 3 of the 7 indicators for which data was available and 3 fold or higher on the remaining 4 indicators. An estimated 40.8% of Indigenous households with a family member on the DSP reported they had run out of money for basic living expenses in the last 12 months. While nearly one in four Australian households thought their standard of living was worse than 2 years previously, over a third of households with a DSP recipient thought their standard of living had dropped compared to a staggering 55% of those receiving Newstart.

Cost of Disability – Income Gaps in Standards of Living

To obtain the same standards of living of like households but who do not have an adult member with disability, households with an adult with profound or severe disability needed $173 a week on average over and above their 2015-16 net (disposable) income and households with adults with mild or moderate disability needed an extra $87 per week on average (Table 2a). However, the gap in standard of living was as high as $277 a week for couple households on the DSP and $489 for couple households with an adult with disability but with a partial capacity to work and therefore on NSA.

Table 1a. Financial Hardship and Insecurity for Different Household Types (% of households)

	All HHs	DSP	Indigenous DSP	NSA	AP
Can't afford to buy new clothes most of the time	11.0	28.5	-	48.0	10.7
Can't afford to spend time on leisure or hobby activities	10.4	27.0	-	44.5	10.2
Can't afford a holiday away from home for at least 1 week a year	22.6	46.3	-	66.2	25.4
Can't afford to have a night out once a fortnight	16.6	39.0	-	54.8	18.1
Can't afford to have friends or family over for a meal once a month	7.3	23.6	-	27.7	9.0
Can't afford to have a special meal once a week	11.9	29.6	-	46.8	12.1
Couldn't pay fuel/telephone bill on time due to money shortage	9.7	18.9	26.8	31.4	4.8
Couldn't pay car registration/insurance on time due to shortage of money	3.9	7.7	10.2	13.0	0.6
Went without meals due to shortage of money	2.7	11.5	13.1	14.4	0.9
Couldn't heat or cool home due to shortage of money	2.3	5.9	5.5	14.8	1.8
Couldn't raise $2000 within a week	13.2	37.5	71.0	43.4	13.6
Sought assistance from welfare/comm. organisations due to money shortage	2.6	10.7	23.0	16.6	2.1
Sought financial help from friends/family	7.0	14.3	34.7	29.1	2.4
Saving is not a main emergency money source for the HH	33.3	59.3	-	73.0	28.5
Unable to save money most weeks	55.3	72.3	-	88.2	60.6
HH standard of living worse than 2 years ago	23.7	34.7	-	54.7	26.2

Source: Authors' calculations from the 2015–16 HES. For Indigenous households data were sourced from the 2014-15 National Aboriginal and Torres Strait Islander Social Survey.

2 x higher than All HH ≥ 3 x higher than All HHs

Table 2a. Cost of disability among households with at least one adult member with disability (2015-16)

All Households	All HHs	Single HHs	Couple HHs
I. Number of Households			
No. of HHs with at least one member with disability	2,754,918	1,058,238	1,696,680
- have profound/severe disability	988,914	282,526	706,388
- have mild/moderate disability	2,000,200	804,867	1,195,332
HHs with members with disability receiving DSP	714,626	297,264	417,362
HHs with members with disability receiving NSA	161,011	66,121	94,890
HHs with members with disability receiving AP	988,433	428,349	560,083
II. Inequality in Standard of Living – average gap in income ($ per week per household) *			
HHs with at least one member with disability	107	46	152
- have profound/severe disability	173	60	233
- have mild/moderate disability	87	41	122
HHs with members with disability receiving DSP	183	93	277
HHs with members with disability receiving NSA	343	176	489
HHs with members with disability receiving AP	122	39	187
III. Cost of Disability in Australia ($ million per year)+			
HHs with at least one member with disability	**15,328.4**	**2,531.3**	**13,410.6**
- have profound/severe disability	8,896.3	881.5	8,558.6
- have mild/moderate disability	9,048.9	1,716.0	7,583.2
HHs with members with disability receiving DSP	**6,800.4**	**1,437.6**	**6,011.7**
HHs with members with disability receiving NSA	**2,871.8**	**605.1**	**2,412.9**
HHs with members with disability receiving AP	6,270.6	868.7	5,446.2

Source: Authors' calculations from the 2015–16 HES. DSP= Disability Support Pension, NSA =Newstart Allowance, AP=Age Pension.

*Notes:** Gaps in income are calculated from our models using unweighted numbers of households; + Costs of disability in Section III are calculated by multiplying number of households (Section I) with average compensating variation (gap in income) per household (Section II) and then annualised. The cost of disability of single and couple households do not sum to all households because of rounding and weighting issues. The cost of disability of households with profound/severe disability and with mild/moderate disability do not sum to the cost of disability for households with at least one member with disability because some households have more than one member with disability (Section I).

The income gap i.e. the cost of disability in 2015/16 for the 2.75 million Australian households with a family member with disability is estimated at **$15.33 BILLION**.

The extra costs faced by the 715,000 households with members with disability receiving the **DSP** amount to **$6.80 BILLION PER YEAR**, and **$2.87 BILLION PER YEAR** for 161,000 households with members with disability receiving the **NEWSTART ALLOWANCE**.

The modelling of the two policy options takes into account inflation from 2016 to 2018 and the average income gaps are rounded up to the nearest five dollars. In the first policy scenario, the DSP is increased by $100 per fortnight for a single person and $310 per fortnight for a couple in a household. This level of additional income support is based on the overall mean income gap observed for all households with and without adult members with disability. This increase does not fully compensate families on the DSP for existing differences in standards of living with matched households. It is, however, in keeping with the overall objective of the DSP to provide income support as a safety net for those unable to fully support themselves, and that the budgetary impact of the policy proposal is realistic. In the second policy option, the current maximum basic DSP rates are maintained but the coverage of DSP is increased so that more people would benefit from the scheme. The new recipients are drawn from the non-DSP recipient population based on their likelihood to receive the DSP if eligibility criteria changed. The number of additional DSP beneficiaries, however, is not unconstrained but rather the modelling is calibrated to ensure the total budgetary impact of both scenarios is comparable. This scenario could represent allowing individuals with a partial capacity to work to shift back from the NSA to the DSP.

Under option 1, it is estimated that the policy change will incur a net cost of around $3.1 billion annually in government expenditure. In other words, to reduce the income gap for households already receiving the DSP by half would cost the Australian Government $3.1 billion a year. This extra expenditure would increase the overall cost of the DSP ($16.7 billion is expected to be spent on the DSP in 2018-19) by 18.6%. Under the modelling of option 1 the number of DSP beneficiaries increased marginally by 2.7% (less than 20,000 persons). These individuals include those who are working a small number of hours per week but are not entitled to the DSP under the existing arrangements but become eligible for a part-pension under the policy change.

To model option 2, the fiscal impact is assumed to be the same as for option 1, so the number of new DSP recipients was increased until the additional cost of the payments reached $3.1bn. In terms of coverage, under this scenario the number of DSP recipients increased by around 280,000 persons, an increase in current beneficiaries by 37.3%. This means the DSP would provide income support for over 1 million Australian adults with disability. This could include all the NSA 'partial capacity to work' recipients plus an additional 80,000 working age adults with disability who are not currently receiving income support through either the DSP or NSA.

Australia's national poverty rate of 13.7% would decline by 0.5 and 0.6 percentage points under option 1 and 2 respectively. Because of the impacts at the household level, there are reductions in the proportion of both children and older adults living below the poverty line. Among all Australian adults who have mild, moderate, severe or profound disability, the poverty rate reduces from 17.5% to 15.8-15.4% under option 1 and 2. Option 1 has a significant impact on poverty reduction among DSP recipients with the proportion of DSP recipients living below the poverty line dropping from 17.8% to 9.7%. An unexpected finding of the second proposal is that the poverty rate in DSP recipients may increase. This is largely driven by the inclusion of new people with disability who are already living in poverty e.g. the partial capacity to work group and going on to the DSP is still not sufficient to raise some of these individuals out of poverty.

CONCLUSIONS

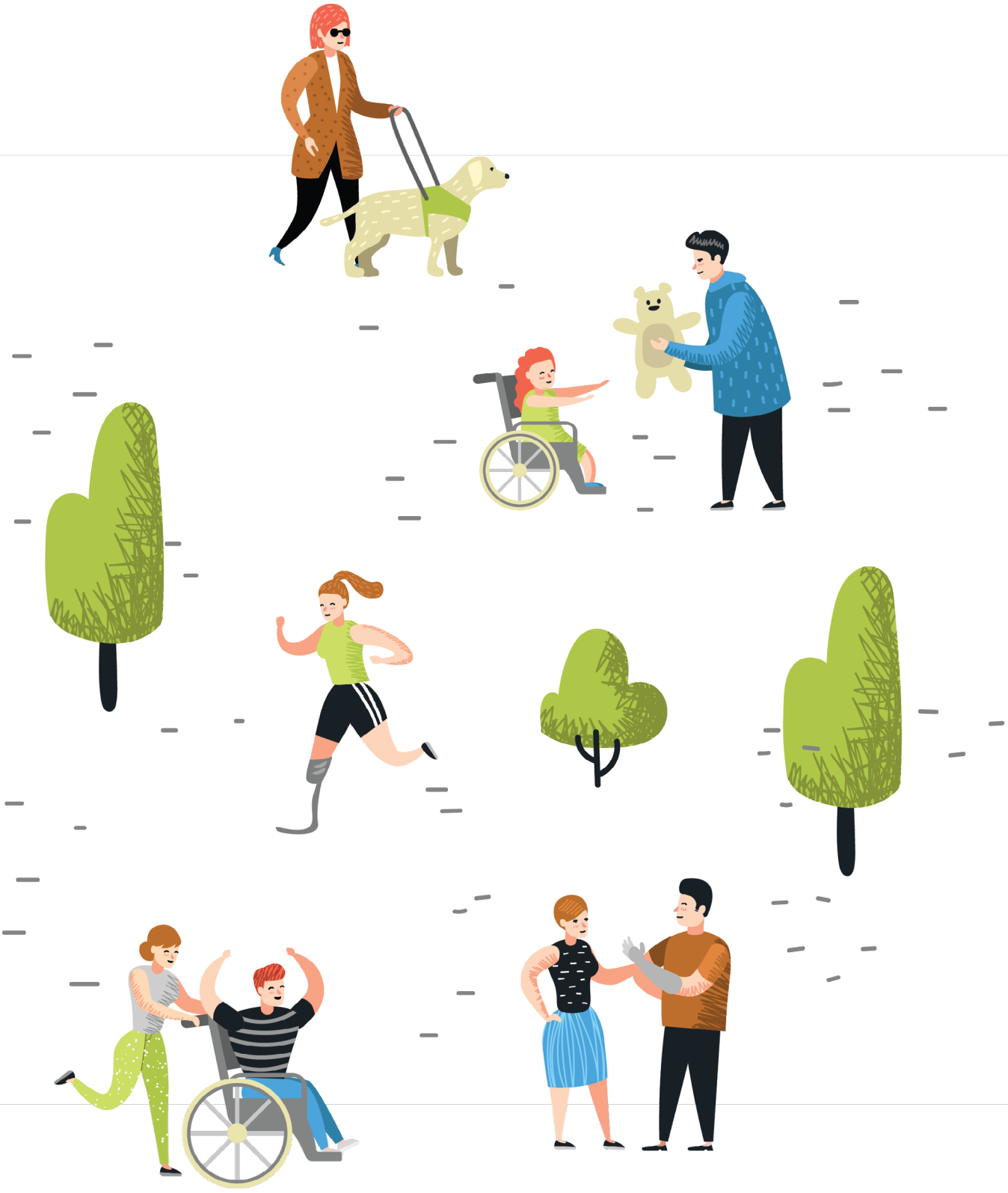
There is very little quantitative evidence on the cost of disability imposed on households with a member with disability in Australia. To the best of our knowledge, this is the first Australian study to apply the standard of living approach where households with a member with disability are matched to households with similar characteristics but who have no member with disability.

On 16 measures of financial insecurity and hardship, the difference in the proportions of households answering yes to experiencing financial vulnerability between households with a member with disability and in receipt of either the Disability Support Pension or Newstart and all Australian households was alarming.

In line with findings in other countries, the cost of disability was found to be substantial with major gaps in household income and standards of living. Using the 2015–16 HES, households having at least one member with disability were found to need an extra $107 per week, or approximately a 10% increase in their disposable income, to reach the same SoL of comparable households. The total cost of disability for the 2.75 million Australian households with a family member aged 16 years and above with disability was estimated to be $15.33 billion. Significantly, the extra costs faced by the 715,000 households with members with disability receiving the DSP totalled $6.80 billion per year, and $2.87 billion per year for the 161,000 households with members with disability on NSA.

In keeping with the impact suggested in the NATSEM 2005 report, the transition of people with disability and a partial capacity to work onto the NSA has resulted in major reductions in standard of living. For households with adults with disability on NSA to have the same standard of living as similar households where no adult member has disability would require a 63.7% increase in the NSA fortnightly payment for single adults with disability and almost a doubling (97.5%) for partnered adults.

Both policy options would require government expenditure of around $3.1 billion per annum. This would close the gap in income by nearly 50% as the current total annual cost of disability for households with a family member receiving the DSP is estimated to be $6.8 billion. As the findings show, this investment under both proposals would reduce poverty rates and improve inequalities in the income distribution at the population level. The improvement in terms of income is stark among low-income households, which is not unsurprising given that there is a higher concentration of DSP recipients in low-income households. The second proposal would extend the coverage of the DSP by 37.3% such that the DSP could provide income support for over 1 million Australian adults with disability including all the partial capacity to work NSA recipients.



1. INTRODUCTION

Disability affects more than 30% of Australian households (ABS, 2018). Many persons with disability experience poor economic outcomes (Meyer and Mok, 2018) with disability and income having a strong negative relationship (Loyalka et al. 2014). People with disability often face barriers to education and skills development, and consequently, experience difficulties with employment and tend to receive a lower wage (Stern 1989). People with disability are also more likely to lose their jobs and thereby face reductions in their earnings and ultimately their standard of living.

Besides the difficulties persons with disability face themselves, many barriers are also encountered by the household where there is a member with disability. Caregiving, lack of earning opportunities, increased household expenses can push households with family members with disability into poverty and financial hardship. Links between disability and schooling, employment and income are clearly apparent in Australia. Findings from the 2015 Survey of Disability, Ageing and Carers (SDAC) of the Australian Bureau of Statistics (ABS) show a higher proportion of people with disability[1] of working age (aged 15–64 years) do not hold a post-school qualification[2] compared with people without disability (44% vs 36%). Notably, this proportion was much higher (71%) among people with profound or severe limitations in core activities. In terms of employment, 54% of Australians without disability aged 15-64 years had a full-time job in 2015 but only 27% of persons with disability, decreasing to only 8% of people experiencing a profound or severe disability. Consequently, people with disability are at a much higher risk of falling into lower-income groups than persons without disability. This has not only been observed for those of working age but also among the elderly, those aged 65 years and over.

The financial difficulties faced by people with disability have been recognised by governments around the world who provide social security benefits as income support to individuals and families with disability. In Australia, people who have a disability and are aged between 16 and the age pension age[3] are eligible for the Disability Support Pension (DSP).[4] This is a means-tested payment subject to a capacity to work assessment. There is no differentiation in benefits for people with disability and those without disability who are pension age or over, both groups are eligible for the Age Pension which has a similar payment rate to the DSP. People with disability who are of pension age or over and are on the DSP can transfer to the age pension if they wish to do so. The maximum benefit of both the DSP and Age Pension is about 65% of the national minimum wage for a person who is single and aged 21 years or over.[5] Although the DSP and Age Pension are the two largest Government welfare programmes in Australia accounting for approximately 40% of the total social security and welfare budget of the Australian government (see Singh and Sharma 2018), the number of DSP recipients is limited. There are approximately 2 million Australians aged between 16 and 64 years who report having a disability but only 35% receive the DSP[6]. Of those individuals who have a severe or profound limitation in a core activity of daily living, less than 50% are DSP beneficiaries. People with disability not only struggle to meet the DSP eligibility rules but also often find it difficult to navigate the system and give the necessary evidence that they cannot work, or retrain to work, for the required number of hours per week (Soldatic, 2018; Soldatic and Fitts, 2018).

In late 2005 the National Centre for Social and Economic Modelling (NATSEM) at the University of Canberra examined the distributional impact of proposed welfare-to-work reforms on people with disability (Harding et al,

1. In this survey, a person with disability is defined as the one reporting disability.
2. Non-school qualifications refer to educational attainments other than pre-primary, primary or secondary educational qualifications.
3. The age pension age increased from 65 to 65.5 on 1 July 2017 and to 66 years from 1 July 2019.
4. Additionally, families having members with care needs may mitigate their caring costs through other government benefits called Carer Payment and Carer Allowance.
5. The national minimum wage for a full-time adult in the financial year of 2015–16 was $656.90 per week while the maximum fortnight DSP rate (including the basic rate, the pension supplement and the energy supplement) was $860.2 for a single person in September 2015.
6. Our calculation from ABS (2016) and DSS (2016).

2005). In the May 2005 federal budget, the Government announced a measure that people with disability who apply for income support after 1 July 2006 and who can work between 15 and 29 hours a week at award wages will be placed on the Newstart Allowance (NSA) (or Youth Allowance) rather than the DSP. Since 2006, these individuals have become known as the 'partial capacity to work' group of beneficiaries.

In 2005, the DSP provided income support to Australians with physical, intellectual or psychiatric impairment that prevented them from working for at least 30 hours a week (or undertake training that would equip them for work) for at least the next two years. People with disability who were in receipt of the DSP prior to 1 July 2006 could continue to remain on the DSP payment subject to the income and asset testing. However, those applying for income support after 1 July 2006 would be assessed by a new 'comprehensive work capacity' assessment. If they were assessed as being able to work 15 to 29 hours per week at award wages in the open labour market then they would be required to seek 15 hours or more of part-time work a week and would be placed on the NSA (or Youth Allowance). This arrangement remains in place today.

However, the NSA provides a significantly lower benefit and has a more stringent income test. It is an unemployment income benefit payment not a welfare pension (Soldatic and Fitts, 2018). Since 2006, eligibility for the DSP was tightened further in 2012 and 2014-15. An overview of reforms to the DSP, including the major 2006 reform, can be found in Fitts and Soldatic (2018), Soldatic and Fitts (2018) and Soldatic (2018).

The NATSEM modelling (Harding et al, 2005) suggested that under the 2006 budget measure the disposable incomes for people with disability could fall by as much as $122 per week compared with the tax and transfer system in 2005. This effectively meant that the living standards of people with disability could be cut by up to 31%.

As Soldatic and Sykes (2017) comment, the relationship between disability and poverty is extremely complex. A significant number of people with disability in Australia are now living in poverty. The Australian Council of Social Service (ACOSS), in partnership with the University of New South Wales, report that in 2015-16, 36.4% of individuals in households whose reference person[7] was on the DSP were living below the poverty line when the 50% of median income poverty line is used. This proportion rises to 56.0% when the 60% of median poverty line is used (Davidson et al, 2018). Further, the lived experience of poverty is being heightened for the growing number of persons with disability who only qualify for basic income support payments, such as the NSA (ACOSS, 2014; Davidson et al, 2018). In addition to lower payments, individuals who have a partial capacity to work are not entitled to government-funded specialised disability supports and subsidies (Soldatic and Sykes, 2017).

Further changes to the DSP were made in 2012 and again in 2014-15. New impairment tables were introduced on 1 January 2012 against which eligibility for support under the DSP focused more on the extent to which a person's impairment affected their ability to work rather than on whether a person had been diagnosed with a disabling condition. The May 2014 Federal Budget announced changes that came into effect on 1 July 2014 intended to 'help young people with disability enter the workforce if they are able to do so'[8]. DSP recipients under 35 years of age with an assessed work capacity of 8 or more hours per week were now required to participate in 'compulsory activities' aimed at assisting them to find employment, including attending regular interviews with Centrelink to develop participation plans to help build their capacity and overcome barriers to work e.g. working for the dole, job search activities, work experience, education and training and connecting with disability employment services (Soldatic and Fitts, 2018). From 1 July 2015, new applicants no longer required medical reports from treating doctors but rather were given a checklist of types

7. The reference person is usually the person who has identified himself/herself as Person 1 in an ABS survey form. Familial and household relationships are then defined in terms of the relationship between the reference person and all other family or household members.

8. https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201415/DSP

of primary medical evidence they could supply to support their application. As Fitts and Soldatic (2018) identify the review process of this evidence also changed with new applicants being required to fulfil a two-stage DSP assessment - undertaking a Job Capacity Assessment (JCA) conducted by an allied health professional such as an occupational therapist, psychologist or social worker; and if the job capacity assessor concluded the individual met the DSP criteria, they then needed a Disability Medical Assessment in which a government-contracted doctor reviews and scores the medical evidence which then determines the outcome of the application (Fitts and Soldatic, 2018).

It is now 13 years since the welfare-to-work change to the DSP was first introduced in 2006. While the DSP remains the main social security payment for working-aged individuals with disability, the evidence base on the impact of policy changes to the DSP since 2006 on the financial well-being of many Australian families is lacking. Are households with family members with disability on the DSP (or NSA) at increased risk of financial insecurity, poverty and lower living standards compared with households where no family member has disability? To what extent do current levels of income support protect households reliant on the DSP as their main source of income from financial insecurity and poverty? If there are major gaps in the living standards of households with and without members with disability, then what level of income support is required through the DSP to substantially reduce these inequities? What impact would broadening the eligibility criteria for the DSP e.g. allowing people with disability now on the lower NSA to be included back on the DSP, have on the financial wellbeing of people with disability and their families? This Report attempts to answer these key policy issues.

The rest of this Report is organised into six sections. Section 2 provides an overview of the policy context and understanding of disability. Section 3 outlines the modelling approach and Section 4 describes the disability income support scheme in Australia and changes in DSP and NSA beneficiary numbers and distribution. Section 5 briefly describes the data and the measurement methods including the methodology to estimate standards of living, costs of disability and the two policy options with changes to the DSP that are modelled in this Report. Detailed information on the methods is provided in the technical notes in the Appendices. Section 6 provides the empirical results and the final section provides some conclusions and discussion on the policy implications of the policy scenario modelling.

2. BACKGROUND

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) (UN, 2008), and Australia's National Disability Strategy (NDS) (COAG, 2011) call for income support to be provided to people with disability through policy instruments such as the DSP. The purpose of the CRPD and NDS are to promote an enhanced quality of life for people with disability and their carers including opportunities for people with disability to fully and effectively participate in all aspects of economic, social and political life, opportunities to live independently and actively engage in their communities, as well as families and carers being well supported.

The rights of persons with disability in having an adequate standard of living and social protection are highlighted under Article 28 of the CRPD. Article 28 states

1. States Parties recognize the right of persons with disabilities to an adequate standard of living for themselves and their families, including adequate food, clothing and housing, and to the continuous improvement of living conditions, and shall take appropriate steps to safeguard and promote the realization of this right without discrimination on the basis of disability.
2. States Parties recognize the right of persons with disabilities to social protection and to the enjoyment of that right without discrimination on the basis of disability, and shall take appropriate steps to safeguard and promote the realization of this right, including measures:

    (a) To ensure equal access by persons with disabilities to clean water services, and to ensure access to appropriate and affordable services, devices and other assistance for disability-related needs;

(b) To ensure access by persons with disabilities, in particular women and girls with disabilities and older persons with disabilities, to social protection programmes and poverty reduction programmes;
(c) To ensure access by persons with disabilities and their families living in situations of poverty to assistance from the State with disability-related expenses, including adequate training, counselling, financial assistance and respite care;
(d) To ensure access by persons with disabilities to public housing programmes;
(e) To ensure equal access by persons with disabilities to retirement benefits and programmes (UN, 2008).

Under the CRPD, the Australian Government is obliged to ensure, promote and recognise that people with disability are entitled to all human rights and fundamental freedoms, with equality of opportunity and without discrimination of any kind on the basis of disability (Productivity Committee, 2019). One of the six key outcomes in Australia's current NDS is people with disability, their families and carers have economic security, enabling them to plan for the future and exercise choice and control over their lives (COAG, 2011; Productivity Commission, 2019). In the NDS, 'Economic Security Policy Direction 2' states:

> "Income support and tax systems to provide an adequate standard of living for people with disability, their families and carers; while fostering personal financial independence and employment.
>
> Income support remains an important safety net to ensure an acceptable standard of living for many Australians with disability. These payments should allow people to live with dignity…
>
> Income support payments also need to be geared so that where possible they encourage people who choose to seek employment to do so, rather than creating new barriers…
>
> It is important that these pensions [Carer Payment and Disability Support Pension] actively support people to participate to the extent their capacity permits, to develop this capacity and to be able to re-enter the workforce if their circumstances change"

(COAG, 2011, pg. 40).

So, for those households reliant on the DSP or NSA as the main source of their income, does the level of support protect them from poverty and provide them with the financial security they require to participate fully in economic, social and political life, as conveyed in the UN Convention on the Rights of Persons with Disabilities and in Australia's National Disability Strategy?

This Report is set within the social model of disability in which society's attitudes, choices, practices and structures hinder people with disability from enjoying full and effective economic participation, social inclusion and equality. Barriers are not the inevitable result of an individual's impairment i.e. a long-term limitation in a person's physical, sensory, mental or intellectual functioning (the medical model of disability) (Terzi, 2004; COAG, 2011; Davis, 2013; Oliver, 2013; Soldatic and Sykes, 2017; Retief and Letsosa, 2018). Rather the social model of disability draws attention to the interaction between an individual's perceived or actual impairment and the disabling barriers that hinder people from participating in society (Devandas Aguilar, 2017).

In this Report the 'cost of disability' is defined as the inequality in the standard of living (SoL) experienced by persons with disability and their families rather than the direct and indirect costs incurred through the 'disability' itself (Retief and Letsosa, 2018). Lower standards of living typically arise because of the interaction between the person's impairment and the barriers they and their family face in participating in society. A SoL method assesses inequalities based on the income gap between households with and without a member with disability and the amount of income needed to ensure both households have the same SoL. In other words, how much extra income is required by households with an adult member with disability to achieve the same SoL of matched households but who do not have a member with disability. The responsiveness of Australia's tax and transfer policy to overcoming structural barriers for people with disability that restrict their life choices and impact on their standard of living is at the centre of the analyses presented in this Report. However, it needs to be noted that the definition of disability employed within a policy and program area e.g. in the eligibility criteria for the DSP versus NSA, determines who gets resources specifically targeted at persons with disability and the distributional impact of the policy measure (Soldatic and Sykes, 2017). Often 'disability' and 'impairment' are used interchangeably in a policy (Soldatic and Sykes, 2017). In general, policies are being developed in Australia within the framework of a social model of disability, but the actual regulatory specifications of the policy measure are defined using the medical model of disability i.e. defined in terms of an individual's physical (including sensory), intellectual or psychiatric limitation.

Cash disability benefits in the current Australian welfare support system play an indisputably critical role, but it is also crucially important to examine the extent to which the levels of current benefits compensate for the 'cost of disability' faced by households with an adult member with disability. Social and political choices will ultimately determine the nature and level of government assistance. However, the design of the relevant policies would benefit from an improved evidence base regarding how disability affects the living standards of individuals with disability and their families (Cullinan, Gannon, and Lyons 2011). Taking this evidence into account in designing policies can shed light on a widely held but very misleadingly favourable view of the economic position of people with disability in the income distribution when disability benefits are included in the measurement of income (Hancock and Pudney 2014).

3. APPROACH

Scope, a disability equality charity in England and Wales, has investigated the extra costs faced by people with disability in the UK (see John et al, 2019). On their website Scope states

> Life costs more for disabled people and their families, spending more on essential goods and services like; heating, insurance, equipment and therapies. These extra costs mean disabled people have less money in their pocket than non-disabled people, or simply go without. The result is that disabled people are more likely to have a lower standard of living, even when they earn the same.[9]

Scope's policy report 'The Disability Price Tag 2019' (John et al, 2019) revealed that one in five British adults with disability faced extra costs of over £1,000 (around AUD $1,800) a month, even after they had received welfare payments designed to meet those costs; on average, the extra costs incurred by adults with disability were equivalent to almost half of their income (after housing costs); and that their money didn't tend to go as far - on average £100 (AUD $180) for an adult without a disability was equivalent to just £68 (AUD $122) for a person with a disability. In this Australian study of the cost of disability, we will use the same standard of living approach used in the UK Disability Price Tag 2019 study (Touchet and Morciano, 2019).

In the literature, four methods have been used to calculate costs associated with disability. These are founded on varying definitions and models of disability: the subjective, comparative, budget standard and Standard of Living (SoL) approaches. Under the subjective approach, people with disability are asked to provide a self-estimation of the extra costs incurred through their disability while in the comparative approach, the actual expenditure data of different groups e.g. those with disability and those without, are collected and then their spending patterns are compared. However, these two methods can underestimate the costs of living with disability as the budget constraints under which households with members with disability live naturally limit their expenditure opportunities and therefore their respondent answers (Melnychuk, Solmi, and Morris 2018; Morciano, Hancock, and Pudney 2015). This limitation can be overcome by using a budget standard approach in which a list of items representing a reasonable SoL is proposed. Then, these items are costed and evaluated to obtain the total spending likely to be borne by people with disability, but this approach is not based on people's and households' actual lived experiences, revealed behaviour and preferences (Melnychuk, Solmi, and Morris 2018). This means that the budget standard approach does not sufficiently account for the cost of disability imposed through the necessary lifestyle changes which people with disabilities and their families need to make because of the barriers and societal disadvantages they confront. This problem can be addressed by using a SoL method which assesses inequalities (the cost of inaction) based on the income gap between households with and without a member with disability and the amount of income needed to ensure both have the same SoL.

Very few studies in the current literature have estimated the cost burden imposed on households who have adults (aged 16 years or above) with disability using the SoL approach pioneered by Berthoud, Lakey, and McKay (1993). Most of these are concentrated in the UK (e.g. John et al, 2019) while others have been undertaken in Ireland, China and Australia[10]. Findings from these studies confirm the substantial additional cost as a proportion of income imposed on individuals and families with disability. The results of these studies vary depending on the groups studied e.g. the elderly or those under pension age, their

9. https://www.scope.org.uk/campaigns/extra-costs/

10. The SoL method is also applied in other studies measuring the cost of disability for a child, such as Melnychuk, Solmi, and Morris (2018) and Solmi, Melnychuk, and Morris (2018).

positions in the income distribution in each country, the ways in which SoL and disability are defined and measured, the strategy to estimate the additional costs based on the SoL, and the income and characteristics of groups of people with and without disability. For example, the cost of disability is estimated at 21–26% of disposable family income in the UK (Hancock, Morciano, and Pudney 2013), around 23% in Ireland (Cullinan, Gannon, and Lyons 2011) and over 37% of equivalent disposable income in Australia (Saunders 2007).

The cost burden for people with severe disability tends to be consistently higher, ranging from 7–12% of income for people with more mild impairment to 37–66% for those with more profound disability (Zaidi and Burchardt 2005) or 55–65% of net income for the elderly with a high level of impairment in the UK (Loyalka et al. 2014). In the case of Ireland, these ratios are 20% and 37% respectively for households with members that mild and severe limitations in activities of daily living (Cullinan, Gannon, and Lyons 2011). Similarly, using the Australian 1998–99 ABS Household Expenditure Survey (HES), Saunders (2007) also found that the estimated cost associated with each increase in disability status was just below 10% of equivalent disposable income. This implies an equivalent cost of around 30% for people with a moderate restriction and about 40% for those with a severe or profound restriction.

Besides the severity of disability, the type of household can also affect the cost burden. A couple with one person with disability tends to have a lower cost burden while a single person with disability or a couple where both have a disability tend to bear higher costs. For example, Loyalka et al. (2014), in their study in China, showed that the cost of disability ranged from 8% for households that had more than two adults to 43% for families with only one adult. The same trends were also demonstrated in studies carried out in the UK (Zaidi and Burchardt 2005; Loyalka et al. 2014).

In this Report, the SoL approach is used to estimate the cost of disability to a household that has at least one adult (aged 16 years or above) member with disability. In other words, we estimate the amount of extra income required by households with an adult member having disability to achieve the same SoL of like households but who do not have a member with disability. Thus, under a social model of disability, this Report focuses on the differences in the cost of maintaining the same SoL experienced by households who have members with disability rather than identifying and measuring all the direct and indirect costs borne by households, third-party payers or the public sector due to an individual having a physical, intellectual or psychiatric limitation. This study updates the earlier estimates provided by Saunders (2007) with up-to-date data and a revised methodology. Additionally, we estimate and compare the costs of disability at different severity levels. From these estimations, we then propose two policy measures in which the Australian disability income support scheme could be changed and examine the impact of these options on poverty and income inequality.

4. INCOME SUPPORT FOR AUSTRALIANS WITH DISABILITY

In Australia, the DSP is the main direct cash benefit for people with disability of working age. As at 1 July 2019 an adult with disability aged between 16 and 66 years (pension age) can receive a DSP. Once a DSP recipient reaches pension age they can transfer to the Age Pension if they so choose. The benefit rate, income and asset tests for the DSP and Age Pension are similar but higher than allowance payments such as NSA in the Australian social security system.

To qualify for the DSP, an adult with disability must be aged between 16 years and the age pension age, meet residency rules, have permanent physical, intellectual or psychiatric impairment, and meet income and assets tests. In particular, to meet the medical rules, the applicant must prove that his/her health condition is equivalent to at least 20 points on pre-determined Impairment Tables. These tables are designed to assess impairments using the medical model approach in relation to a person's capacity to work and assign a number of points to the severity of the disability and its impact on a person's

ability to function (5, 10, 20 and 30 points for impacts rated as mild, moderate, severe and extreme, respectively)[11]. It is worth noting that the applicant's health problems may only be assigned a rating if they are fully diagnosed, treated and likely to last for at least two years, and which, therefore, prevent him/her from working or retraining to work for at least 15 hours per week. This prerequisite led to the fact that many people with disability became ineligible to receive the DSP since these assessment tables were introduced in 2012, adding to the earlier 2006 reforms (Singh and Sharma 2018).

In this Report, we use data from the 2015-16 Household Expenditure Survey (HES) out the analyses. Therefore, the related transfer policies published in September 2015 are discussed in this section. However, the findings of the modelling are uprated to 2019 to make them current.

For those who are eligible given their health problem scores, the amount of the DSP payment they can receive depends on their age, marital status, income and assets.

For eligible people aged 21 years or over, the maximum fortnightly DSP rate (including the basic rate, pension supplement and energy supplement) at September 2015 was $860.20 for a single person and $648.40 for a member of a couple[12]. For eligible people under 21 years and who have no children, the maximum fortnightly DSP rate (including the basic rate, youth disability supplement, energy supplement and pharmaceutical allowance) was $548.5 for people living independently or around $370 for those living at home. Except for individuals who are permanently blind, the DSP is a means-tested payment with both income and asset tests being applied. The income test is based on total income from all sources, including income from financial assets[13].

In 2015, the DSP payment was reduced by 50 cents for each dollar of income over $162 per fortnight for a single person or $288 per fortnight for a couple[14]. In terms of the asset test, the DSP also decreases by $1.50 for every $1,000 worth of assets above $205,500 for a single homeowner; $354,500 for homeowners in a couple; $291,500 for a single non-homeowner; and $440,500 for non-homeowners in a couple[15].

As previously commented, the DSP is not primarily designed to provide income support to older persons with disability who may be eligible to receive the Age Pension, of which the rates and income or asset tests are similar to those of the DSP scheme. Thus, older persons with disability do not have to face the same difficulties in terms of providing ongoing evidence to meet the health and job capacity assessment eligibility criteria to receive a payment. However, there is no progressive rate under the Age Pension applied to persons with disability compared to those without disability.

As well as the direct cash benefit that people with disability can receive, their families may also be assisted through the Carer Payment/Allowance scheme. In cases where other family members are the caregivers for relatives with disability, they may qualify to receive a Carer Allowance, Carer Supplement and Carer Payment. Carer Allowance and Carer Supplement are both non-means-tested payments and in 2015 were paid at the rates of $121.70 per fortnight and $600 per year[16] respectively. Regarding the Carer Payment, its rate, income and asset tests are also similar to those of the DSP and Age Pension. In cases where non-family members are the carers for individuals with disability, these carers rather than family members receive these payments. The focus of this report is the DSP; therefore, the Carer Payment/Allowance scheme is assumed to remain unchanged and with no impact on the proposed scenarios related to changes in the DSP.

11. See details in the legislation document of Social Security (Tables for the Assessment of Work-related Impairment for Disability Support Pension) Determination 2011.
12. As at 20 March 2019 these payment rates were $926.20 for a single person and $698.10 for a member of a couple.
13. Income from financial assets is calculated using the deeming rate, i.e. 1.75% for the first $51,200 of total financial assets for a single person or the first $85,000 of total financial assets for a couple. For families having their financial assets valued beyond these thresholds, the deeming rate of 3.25% is applied.
14. Therefore, the cut-off income points per fortnight (at which DSP reduces to $0) were $1,882.4 for a single person and $2,881.6 for a couple aged 21 years and over. For those aged under 21 years, the cut-off points were $1,289.6 for a single person living independently, or around $945 for a single person living dependently.
15. Hence, people with disability aged 21 years and over cannot receive any DSP if their assets are valued at more than $779,000 for a single homeowner, $928,000 for joint homeowners, $1,156,500 for a single non-homeowner, $1,305,500 for joint non-homeowners. For those aged under 21 years, the cut-off asset points were $581,500 for a single person living independently or around $465,000 for a single person living dependently.
16. In 2019 the carer allowance is $129.80 each fortnight and the Carer Supplement is unchanged at $600 per year.

Phillipa's Story

I never once questioned whether they would accept my application for disability, I always assumed that based on the criteria and my conditions that I was clearly eligible and would receive the Disability Support Pension. I first began experiencing symptoms of Chronic Fatigue Syndrome and Fibromyalgia when I was in my twenties and was formally diagnosed at 31. During this time, I was scared, dealing with horrific, disabling symptoms, grieving the person I was and a career and friends I had to let go of - I honestly thought that Centrelink would act in my best interest.

I submitted my application to the best of my ability and trusted it was enough. I followed up all the time to see if they needed more information or if there was anything else I could get them to help the process along. Each time I contacted Centrelink they said they would be in touch if they needed anything else. When I contacted the Centrelink Call Centre I was constantly on hold and hung up on. Despite being limited in my functioning I would go in to my local office as it was easier and I thought if they saw how sick I was face to face they could speed things up. That didn't work and the inconsistency of the advice received and staff knowledge was hard to manage. I was being told different things by different people.

I applied in early 2017 and was rejected in September 2017 due to insufficient medical evidence. I appealed with the new information and followed up constantly. Eventually in July 2018 I found out that my application was again denied. Eventually my father contacted our local MP and my local MP advocated for me with Centrelink. Centrelink escalated my application. All this effort resulted in Centrelink advising me to make a fresh application for the DSP but I'm too traumatised to be honest to open that door again. The whole situation has been incredibly stressful and confusing.

It may seem hard to understand why I don't make a fresh application for the DSP. The experience with Centrelink – making me go to job search providers who were just shocked I was there, telling me I should be on the DSP but that they also couldn't help me achieve that. I still can't quite understand how an agency that is there to support you when you really need it was so inconsistent and careless in their advice both in person and over the phone. They should have done more, if they had communicated effectively with me from the beginning and provided the right advice my stress and trauma levels would be drastically reduced. The stress and trauma I experienced as a person with a disability applying for a Disability Support Pension was so extreme that I cannot face that again

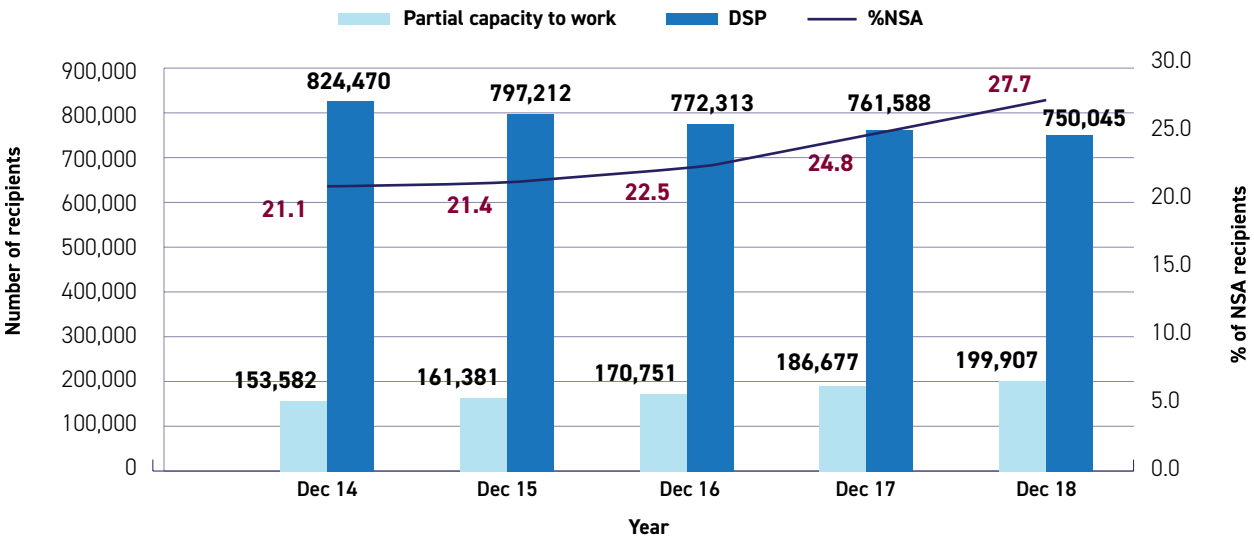
I am currently on Newstart, but I am exempted from the requirement to look for work as I am too unwell. I often have to sleep 20 hours a day whilst suffering from a vast array of symptoms that continue to affect my daily functioning and physical and cognitive output.

Historically, according to Singh and Sharma (2018), from 1991-92 when the Invalid Pension was replaced, the DSP expenditure grew annually at a relatively stable rate of 3.5% (in real terms) until 2007–08. The period between 2007–08 and 2011–12 saw a sharp increase in DSP expenditure with an average growth rate of 8.7% per annum, largely due to the impact of the global financial crisis and softer labour market conditions, together with a major policy reform in the single base pension rate (from 25% to 27.7% of Male Total Average Weekly Earnings). A progressive increase in pension age for women from 60 to 65 years between 1995 and 2013 also played an essential role in the strong growth during this period. Since 2012-13, the growth in DSP expenditure has slowed significantly, averaging only 0.2% per year (in real terms) over the five years to 2016–17. The number of DSP recipients fell by 9% over the 4 years from December 2014 to December 2018 (Figure 1). This reflected the introduction of new assessment tables for work-related impairment and an additional job capacity assessment for new applicants. The number of new recipients per year decreased from 89,000 in 2009–10 to around 32,000 in 2016–17. From 2010-11 to 2017-18, the rate of successful disability support pension claims declined markedly, from 69% of claims in 2010-11 to 40.6% in 2013-14 and then to only 29.8% in 2017-18[17].

Department of Social Services data (DSS, 2018) shows that in December 2018 there were 750,045 recipients of the DSP - 399,603 (53.3%) of whom were men and 350,442 (46.7%) were female. Most DSP recipients were single (578,399 persons or 77.1%) with 171,646 (22.9%) being partnered. In receiving benefits and allowances, it is optional for people to identify themselves as 'Indigenous'[18] . In December 2018 there were 49,035 people receiving the DSP who self-identified as Aboriginal, Torres Strait Islander or South Sea Islander. This indicates that Indigenous Australians are two and a half times more likely to be on the DSP than non-Indigenous Australians, reflecting both a higher prevalence of disability as well as significantly higher rates of unemployment and socio-economic disadvantage (Soldatic, 2018; Soldatic, 2018a). The top recorded medical conditions of DSP recipients are psychological/psychiatric (34%), followed by musculoskeletal & connectivity tissue (21%), intellectual/learning (15%), nervous system (6%), circulatory system (3%) and others.

Currently, the DSP is the second largest welfare programme of the Australian Government, only Age Pension being larger. Out of a total social security and welfare budget of $153.2 billion in 2016–17, $44.2 billion (28.9%) went to the Age Pension, followed by $16.3 billion (10.6%) to DSP and $8.1 billion (5.3%) to Carer Payment (see Singh and Sharma 2018).

Figure 1. DSP and NSA 'partial capacity to work' recipients



Source: DSS demographic statistics various years

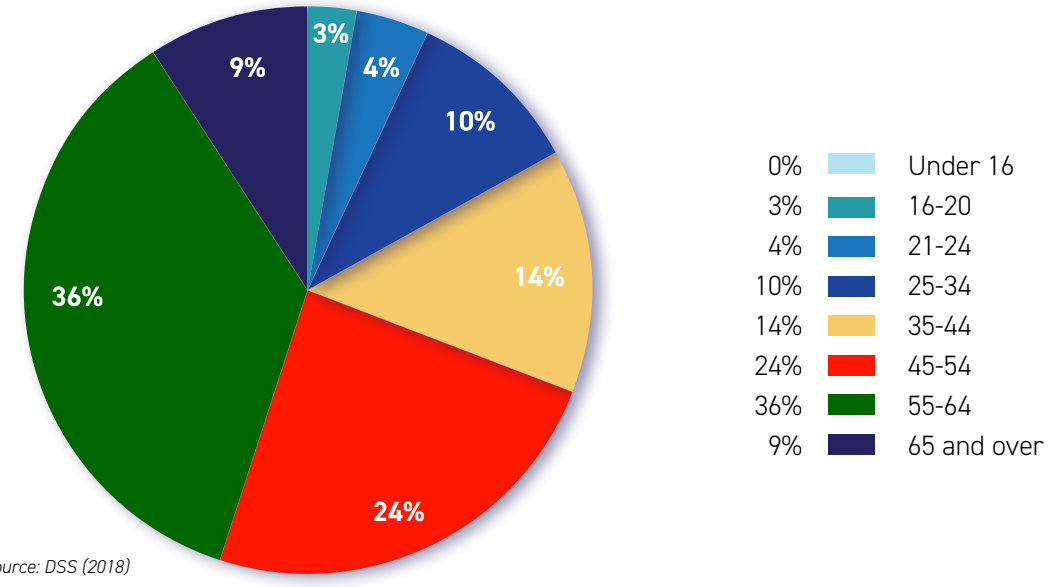
17. https://www.theguardian.com/australia-news/2019/apr/10/record-number-of-sick-or-disabled-newstart-recipients-as-coalition-seeks-savings

18. Individuals who are identified Indigenous includes people who self-identified themselves as being: Aboriginal; Torres Strait Islander; both Aboriginal and Torres Strait Islander; Aboriginal and Torres Strait and South Sea Islander; Torres Strait Islander and South Sea Islander; Aboriginal and South Sea Islander; or Indigenous Australian.

As previously stated, there is a strong policy interaction between the DSP and the other income support payments, mainly the Age Pension and Newstart Allowance. The tightening of the eligibility criteria for the DSP led to a significant transition of recipients from receiving the DSP to the NSA which is paid at a lower rate (Singh and Sharma, 2018). As Figure 1 shows as at December 2014 there were 153,582 individuals in the partial capacity to work group receiving the NSA, representing 21.1% of all NSA recipients. Four years later, in December 2018 the number had grown by 30.2% to almost reaching 200,000 Australians. Those classified as having 'partial capacity to work' now account for nearly 28% of all NSA recipients. If the 2005 NATSEM modelling holds true then a very large number of Australians with disability and their families will have had substantial declines in their standard of living.

Additionally, half of all DSP recipients move onto the Age Pension because they reach pensionable age. This is reflected in Figure 2 which shows the largest concentration of DSP recipients is among individuals in the mature working-age population i.e. those aged 45–54 years and 55–64 years. Only 9% of DSP recipients are aged 65 years or above as at December 2018 data (DSS, 2018). In contrast, the under 35 year age group who were impacted the most by the 2014-15 changes in the DSP eligibility criteria, represent 16.5% (124,081 persons) of all DSP recipients.

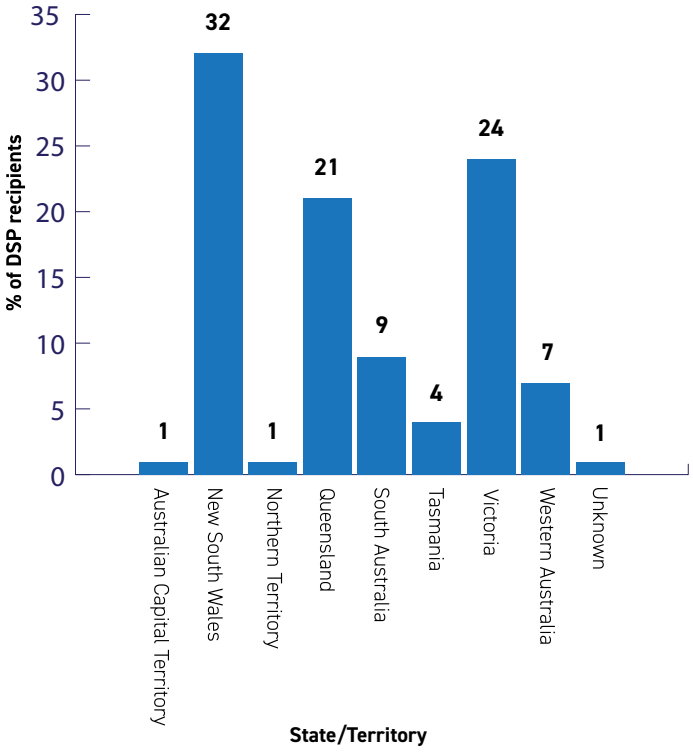
Figure 2. Distribution of DSP recipients by age group (%) (as at December 2018)



Source: DSS (2018)

Figure 3 shows the distribution of DSP recipients across the States and Territories. Nearly eight of 10 DSP recipients live in the three most populous states of New South Wales, Victoria and Queensland. In contrast only around 1% live in the ACT or NT.

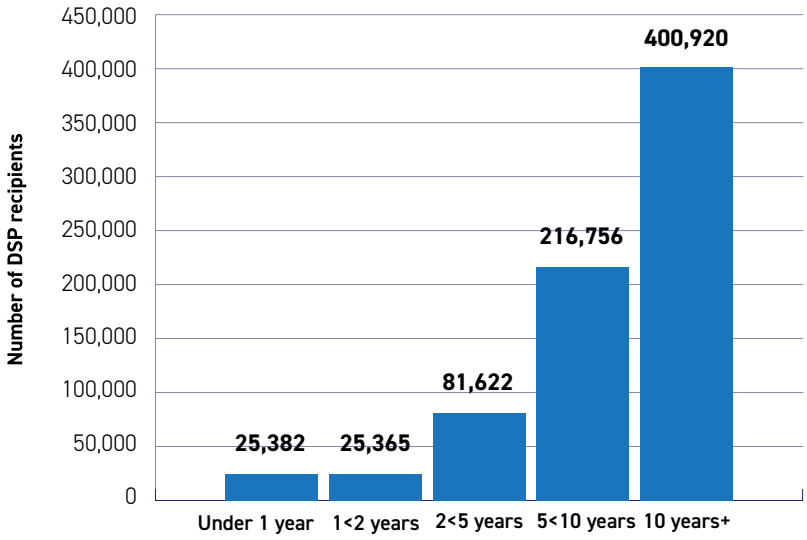
Figure 3 Distribution of DSP recipients by State/ Territory (%) (as at December 2018)



Source: DSS (2018)

The average duration DSP recipients spend on the DSP is 688 weeks or around 13 years. The distribution of the duration people receive the DSP indicates that more than 50% of DSP recipients receive this income support payment for 10 or more years (Figure 4).

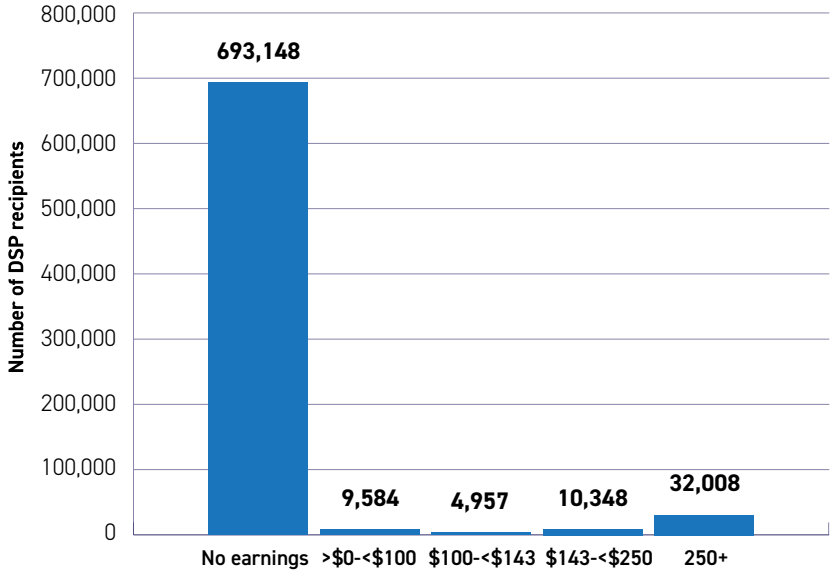
Figure 4. Distribution of DSP recipients by duration of DSP payments (as at December 2018)



Source: DSS (2018)

As explained earlier, one of the criteria for receiving the DSP is meeting the income test. It is not surprising therefore that Figure 5 shows that the majority of DSP recipients (92%) do not earn at all and less than 5% of recipients have earned at least $250 per week during the last fortnight. These statistics support the negative association between DSP payments and income as discussed in the literature.

Figure 5. Distribution of DSP recipients by earnings from employment in the last fortnight (as at December 2018)



Source: DSS (2018)

5. DATA AND METHODS

For more detailed information on the data and methods used in the modelling see the Technical Notes provided in the Appendices.

HOUSEHOLD EXPENDITURE SURVEY

The main dataset used in this Report is the latest Household Expenditure Survey (HES) from the ABS which was conducted in 2015–16. HES is one of the primary datasets collected by the Australian Government to study the income and consumption patterns of Australian households. It includes an additional sample of metropolitan households whose main income source was a government pension or allowance (ABS 2017). This inclusion potentially captured an increased number of households who had a family member with disability, thus making the estimates more reliable as a result.

The ABS (2017) states that the information in the HES is collected by interviewing typical residents of private dwellings in both urban and rural areas of Australia and is representative of the whole of the Australian population as the survey covers about 97% of people living in Australia. Around 1% of individuals aged 15-64 years and who have a disability (approximately 15,000 persons) live in non-private residential or supported accommodation. These persons are not represented in the HES and as such younger persons with disability living in residential care are not included in the analyses.

However, HES is a repeated cross-sectional survey that is designed to produce reliable estimates for broad aggregates of income, wealth, housing and expenditure of Australian families. A household in the HES is defined as an income unit or a group of income units who usually live in the same private dwelling, with an income unit being defined as a person or a group of related persons within a household who share their income. In each income unit, at least one of its members is aged 15 years or over.

ABS DEFINITION AND PREVALENCE OF DISABILITY

Because the data used in the analyses come from the ABS HES, the data are defined in terms of the ABS definition of disability i.e. any limitation, restriction or impairment which restricts everyday activities and has lasted, or is likely to last, for at least six months. In the HES survey, households were asked if any member had a condition that had lasted or is likely to last for six months or more. If the answer was 'yes' then they were directed to a number of follow-up questions about the condition, the area of that person's life that was affected by this condition, and they were also asked to determine the extent to which the condition limited the person's activity, such as restrictions in physical activities, difficulties in understanding things, mental illness and memory problems, head injury or stroke and other long-term conditions of disability. Then, the answers to these questions were used to classify disabilities into mild, moderate, severe and profound core activity limitation.

In this Report, a household having a member with disability is defined as one which has at least one adult member self-reporting as having any long-term limitation in a core activity.[19] Given the relationship between cost burden and the level of impairment, households are further classified into those where the family member has either: (i) mild and moderate disability; or (ii) severe and profound disability. Table 1 gives details of the extent of disability by severity. At an individual level, the records in HES weighted to represent the Australian population indicated there are more than one million adult Australians[20] with severe/profound disability and over 2.2 million with a mild/moderate disability. The majority of these individuals experienced limitations in everyday physical activities, with mental health problems also being very prevalent. Among those reporting having a disability, over 70% with severe/profound disability and 50% with mild/moderate limitations received the DSP or Age Pension.

19. In this study, persons facing any restrictions in employment or education or those with any other long-term health conditions are not included in the analyses
20. In this context, adult is defined as any person aged ≥15 years.

Overall, some 2.75 million Australian households (28.7%) had at least one adult member with disability. Nearly 20% of households had 2 or more family members with disability. Over a third of households had a family member with disability on the Age Pension, and nearly half of households with a family member with severe or profound disability had a family member receiving the DSP.

Table 1. The distribution of disability by severity in 2015-16

All Households	Any disability	Severe/ Profound	Mild/ Moderate
At the individual level			
Number of adults with disability	3,294,723	1,065,280	2,229,442
(% of the adult population)	(13.3)	(4.3)	(9.0)
% of whom			
- Restriction in physical activities	77.8	73.1	80.0
- Difficulties in understanding things	11.2	19.5	7.2
- Mental illness, memory problems	27.4	39.0	21.9
- Head injury, stroke	7.0	11.6	4.8
% of whom			
- Receiving DSP	23.3	42.0	14.3
- Receiving NSA	5.2	3.4	6.0
- Receiving Age Pension	34.7	30.4	36.7
At household (HH) level			
No. of HHs with at least one member with disability	2,754,918	988,914	2,000,200
(% of all HHs)	(28.7)	(10.3)	(20.8)
% of which			
- Receiving DSP	25.9	45.8	19.3
- Receiving NSA	5.8	4.5	6.5
- Receiving Age Pension	35.9	33.6	38.6
- HHs with one adult with disability	81.9	92.6	89.0

Source: Authors' calculations from the 2015–16 HES. Numbers in Table 1 are weighted to be representative for the Australian population.

INCOME VARIABLE

The measurement of income needs to reflect the resources that are available to households to spend on 'necessity' goods (products and services households buy regardless of changes in their income) and 'luxury' goods (goods whereby the demand by a household for the good increases proportionately more when income rises). This suggests that net income after taxes and benefits i.e. disposable income is the more relevant variable than gross income. Income from all sources i.e. earnings from wages and salaries, self-employment, investment and pensions should be included. Welfare payments and benefits such as the DSP, NSA, Age Pension and others are also included as these are part of family income. For many low-income households these transfers are their main source of income, and thus have a potentially large effect on their living standards. All monetary values are at 2015-16 prices and are expressed as weekly income.

STANDARD OF LIVING (SoL)

The first step in the estimation modelling is to derive a robust measurement of the standard of living which is tailored towards the lower end of the income distribution where many households having members with disability are concentrated. Following the approach by Hancock, Morciano, and Pudney (2013), Solmi, Melnychuk, and Morris (2018), and Touchet and Morciano (2019), SoL is estimated by creating a composite index based on a set of variables reflecting households' risk of financial insecurity and hardship.

In the HES there are a number of questions which ask whether a family did not or could not afford a number of activities/items viewed as potential 'necessities'.[21] These cover both objective and subjective measures of financial vulnerability. Sixteen questions were chosen, as listed in Table 2, to construct the Index. Each question became an indicator which was set to 1 if the respondents answered that they could not afford an item/activity and 0 otherwise.

Table 2. Indicators of financial vulnerability used to estimate the living standards index

Variable
Can't afford to buy new clothes most of the time
Can't afford to spend time on leisure or hobby activities
Can't afford a holiday away from home for at least 1 week a year
Can't afford to have a night out once a fortnight
Can't afford to have friends or family over for a meal once a month
Can't afford to have a special meal once a week
Couldn't pay fuel/telephone bill on time due to money shortage
Couldn't pay car registration/insurance on time due to shortage of money
Went without meals due to shortage of money
Couldn't heat or cool home due to shortage of money
Couldn't raise $2000 within a week
Sought assistance from community organisations due to money shortage
Sought financial help from friends/family
Saving is not a main emergency money source of HH
HH standard of living worse than 2 years ago
Unable to save money most weeks

21. We could not use household asset ownership (which was applied in some studies such as Berthoud, Lakey, and McKay 1993; Zaidi 2005; Cullinan, 2011; Loyalka et al. 2014) to measure living standards because this information is not available in HES.

The information in these indicators are captured in the SoL index. A composite index can be interpreted as a form of data reduction in which information contained in a range of related variables is brought together to form a much smaller number of 'new variables' known as principal components. These components or dimensions capture the variation in the dataset and are then used to create a single summary measure i.e. the index. Technical details on the construction of the Standards of Living Index are provided in Appendix A.

THE COST OF DISABILITY – INCOME GAPS AND MATCHING HOUSEHOLDS

Different statistical strategies have been applied in the literature to estimate the cost of disability based on SoL and income (see Appendix A). Following Hancock, Morciano and Pudney (2013), Melnychuk, Solmi and Morris (2018), and Solmi, Melnychuk, and Morris (2018), the cost of disability is estimated in this Report by calculating the difference between the 'actual' income of households having a member with disability and an 'expected' income. The expected income is the income of 'counterfactual' matched households that have the same characteristics of the families with a member with disability but none of their family members has disability. This approach is the standard economic method known as 'Compensating Variation' (CV) in income i.e. how much extra income do households with a family member with a disability need to be compensated to cover the cost burden of disability in order to achieve the same standard of living.

The underlying assumption of this SoL method is, with the same income level, families with disability may experience a lower SoL than their counterparts without disability (Figure 6). Because households with members with disability must allocate their household resources, which are often very limited, in ways to try to overcome the barriers they face, they have less opportunity to spend on goods and services that might increase their SoL. In this context, the term 'standard of living' is taken to indicate the material well-being of a household rather than their overall level of satisfaction or happiness (i.e. their general utility). Therefore, the SoL approach estimates the extra living costs imposed on households rather than reflecting a loss in subjective well-being as a direct result of any impairment (Zaidi and Burchardt, 2005) (see Appendix A for further explanation).

Figure 6 demonstrates the expected relationship between SoL and income by comparing two hypothetical households – Jack's family and Joseph's family (Vignette 1).

To estimate these income gaps, households with and without a person with disability were matched on a number of social, demographic and economic observed characteristics of the households. A technique known as 'Nearest Neighbour Matching' (NNM) was used to 'pair-up' households (Abadie and Imbens, 2011) – such as matching Jack's family to Joseph's. A household is deemed to be the 'nearest' match based on how close it is to the selected household in terms of the statistical patterns in their characteristics. This matching process including the variables on which households were matched is explained in more detail in the Technical Notes in Appendix A.

Vignette 1 – Jack & Joseph

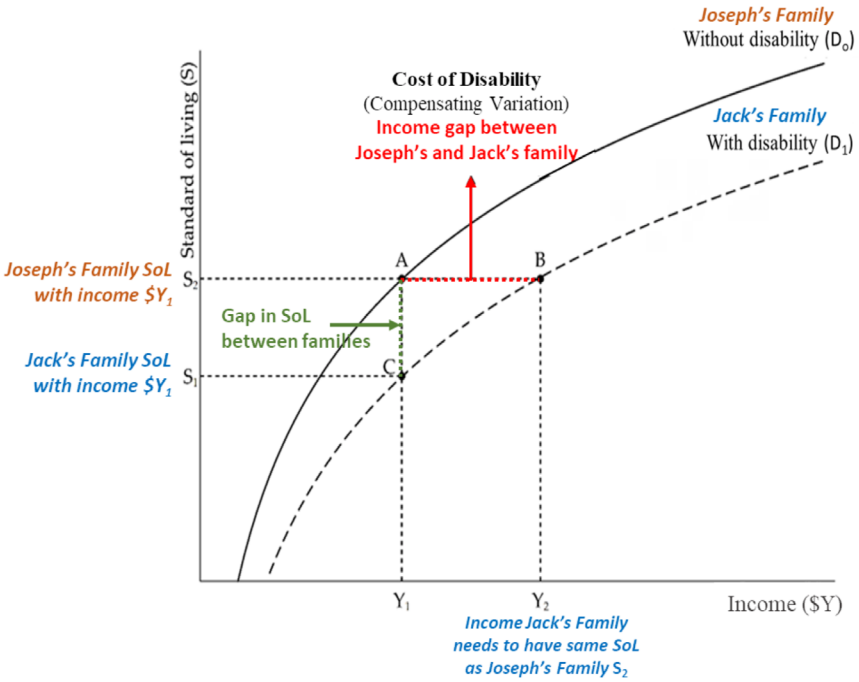
Jack is in his early 40's and lives with his wife and two children. Jack has a profound disability and is unable to work. Jack's wife Mary is his main carer and they live on the DSP. Two doors down is Joseph's family. Joseph is also in his early 40s. He is married to Marge and has 2 kids as well. Neither Joseph nor Marge have a disability and both work. While the families are similar in almost all ways and get on very well, they have different standards of living.

Both families SoL increases when their household income increases – Jack's family follow the trendline D_1 and Joseph's family D_0. For any level of household income, Jack's family's SoL is lower than Joseph's because they have to spend more of their household budget on costs related to Jack's disability and overcoming barriers the family face. If the two families had the same level of income, such as $\$Y_1$ then Jack's family would have a SoL of S_1 whereas Joseph's family's SoL is higher at S_2 – because point A on Joseph's family income-SoL curve at income $\$Y_1$ is higher than point C for Jack's family.

To reach the same SoL (S_2) as Joseph's family, Jack's family needs to be compensated with a higher income. On Figure 6, if you track horizontally across from Joseph's family SoL S_2 to Jack's family curve then you reach point B. Point B means Jack's family needs to have an income of $\$Y_2$ to have the same SoL of Joesph's family.

The income gap between the two families of $\$Y_2$ - $\$Y_1$ is called the 'compensating variation'. This is the 'cost of disability' for Jack's family compared with Joseph's i.e. it is the amount of income that Jack's family needs to be compensated to have the same standard of living as Joseph's family.

Figure 6. Standard of living, income and cost of disability



POLICY OPTION SCENARIO MODELLING

Two policy options are investigated:

1. DSP payments are increased to offset some but not all of the cost of disability. Because of budgetary implications, the gap in standard of living of households of recipients of the DSP compared with households without an adult member with disability is on average halved. To achieve this the DSP is increased by $100 per fortnight for a single person and $310 per fortnight for a couple in a household. There is no change to the DSP eligibility criteria, so the number of DSP recipients remains largely unchanged;
2. The disability income support scheme is expanded whereby some people who have a disability but who are not currently DSP recipients become eligible. The number of additional beneficiaries is constrained to ensure the total budgetary impact is the same as for option 1. The number of recipients could be increased by relaxing the DSP eligibility criteria, including allowing individuals with a partial capacity to work to shift back from the NSA to the DSP. For simplicity in the modelling, individuals in the HES with similar characteristics to existing DSP beneficiaries were selected to become recipients until the cost of the DSP matched option 1.

The first policy option is the primary focus of the Report. However, given the current public debate over the inadequacy of and need to raise the NSA (Deloitte Access Economics, 2018), largely because of the increasing number of people on NSA living in poverty, the second proposal offers an alternative policy option which has comparable implications to option 1 on Government fiscal resources.

The Report uses NATSEM's microsimulation model STINMOD+ to simulate the changes in disposable income, including the changes in the tax and transfer payment system. STINMOD+ is a microsimulation model that calculates the effects of tax and transfer policy on disposable incomes (Li and La, 2018). It comprehensively models the tax and transfer system in Australia and includes all personal taxations and federally administered welfare payments other than the National Disability Insurance Scheme (NDIS). The model replicates the implementation of the policy options in real life, incorporating elements such as income testing and asset testing.

STINMOD+ also provides estimates of poverty and income inequality, the cost of the proposed reforms and the distributional impact of these changes. The poverty estimates follow the ACOSS-UNSW 'Poverty in Australia 2018' report (Davidson et al, 2018). A person is deemed to be living in poverty if the household they live in falls below the poverty line. The poverty line is set at half the median equivalised household disposable income, adjusted for housing costs. This definition was applied to the ABS Survey of Income and Housing 2015-16 to reveal the patterns of poverty.

All estimates are annualised based on current (the financial year 2018–19) taxation and transfer policies. To calculate poverty rates at the small area level (SA2 level), NATSEM's spatial microsimulation model was used. This methodology has had an extensive validation process to ensure the reliability of the estimates as discussed in Rahman et al. (2010) and Tanton and Edwards (2013).

6. RESULTS

FINANCIAL INSECURITY AND HARDSHIP

The distribution of responses to the 16 indicators used to construct the Standard of Living Index is given in Table 3. Responses are provided for all Australian households (All HHs), compared with households with an adult member with disability receiving the Disability Support Pension (DSP), households with a member with disability receiving Newstart Allowance (NSA), and households with a member with disability receiving the Age Pension (AP). Some comparable data are also available for several of the indicators for households with an Aboriginal and Torres Strait Islander family member with a disability receiving the DSP (Indigenous DSP).

The findings presented in Table 3 are telling - households with a member with disability and receiving either the DSP or NSA are much more likely to experience financial hardship and insecurity compared with all Australian households (all HHS) or households with an older member with disability receiving the age pension (AP). The proportion of families with a DSP recipient answering 'yes' to the 16 questions was at least double that of all Australian households on 12 of the 16 indicators, and 3 or more times higher on 3 indicators. Households with an adult with disability and on Newstart (NSA) or Aboriginal and Torres Strait Islander households with a member receiving the DSP (Indigenous DSP) are at even higher risk. The proportion of NSA households was more than twice all Australian households on 15 of the 16 indicators and 3 or more times higher on 12 indicators, and Indigenous DSP households more than double on 3 of the 7 indicators for which data were available and 3 fold or higher on the remaining 4 indicators. All these 16 indicators are of concern, but of particular note, are the relatively high proportions of households with persons with disability who 'went without meals due to a shortage of money' and who 'sought assistance from welfare/community organisations due to a shortage of money'. Furthermore, an estimated 40.8% of Indigenous households with a family member on the DSP reported they had run out of money for basic living expenses in last 12 months.

While nearly one in four Australian households thought their standard of living was worse than 2 years previously, over a third of households with a DSP recipient thought their standard of living had dropped and a staggering 55% of those receiving the NSA.

Lillian's Story

Lillian developed acute pulmonary hypertension in 2015. She also suffers from severe depression. She finished school in year 9 and had worked as a hairdresser for the last 30 or so years. When Lillian became ill she lost her job, and she is currently couch surfing. Lillian is also involved with the family law court to get custody of her son. Lillian received assistance from a community legal centre in 2017 after 3 failed attempts to access the DSP.

Lillian faced many barriers in trying to get the DSP. The first was meeting the requirement of a condition which is "fully diagnosed, treated and stabilised." The severity of her pulmonary hypertension means Lillian requires a heart lung transplant but she was found to be unsuitable. Lillian's doctors where ill-informed and failed to address in their reports, written in support of Lillian's DSP application, the medical or other compelling reasons for Lillian not to undertake a heart lung transplant. Lillian's pulmonary hypertension was therefore found not be fully treated and stabilised and her DSP application was rejected.

Secondly, Lillian submitted countless volumes of raw medical data only to be told that the information she was supplying was not assisting her claim. Lillian was assisted by the legal centre in obtaining tailored medial evidence but despite this Lillian faced great difficulty in obtaining stronger medical evidence as many of her doctors had grown tired of writing reports free of charge. With specialist reports costing anywhere between $2,000-$4,000 Lillian was again barred from accessing the DSP.

The third barrier that Lillian faced was that whilst the Job Capacity Assessor determined that she was unfit to continue to work as a hairdresser, the JCA believed that Lillian would be able to undertake light – less skilled tasks of an administrative nature. Thus Lillian was not found to have a continuing inability to work but remember Lillian had left school in year 9, she had never worked in an office environment, and she was struggling with severe depression and was daunted by the thought of having to retrain and reskill for administrative duties.

Fourthly Lillian was unaware of the mandatory professional diagnosis requirement. Lillian had been diagnosed with depression by her GP and was receiving treatment from a registered psychologist. Had Lillian understood the eligibility requirements better she would have known that under Impairment Table 5 the diagnosis of a mental health condition must be made by an appropriately qualified medical practitioner. Where the appropriately qualified medical practitioner is not a psychiatrist, the diagnosis must be made by a GP with evidence from a clinical psychologist.

The fifth barrier Lillian faced was that she had not actively participated in a Program of Support for 18 months in the 3 years prior to submitting her DSP application. This meant the Assessing Officer could not assign Lillian a severe impairment rating across multiple Impairment Tables. As a result, she did not satisfy the severe impairment rating required for the DSP.

Table 3. Financial Hardship and Insecurity for Different Household Types (% of households)

	All HHs	DSP	Indigenous DSP	NSA	AP
Can't afford to buy new clothes most of the time	11.0	28.5	-	48.0	10.7
Can't afford to spend time on leisure or hobby activities	10.4	27.0	-	44.5	10.2
Can't afford a holiday away from home for at least 1 week a year	22.6	46.3	-	66.2	25.4
Can't afford to have a night out once a fortnight	16.6	39.0	-	54.8	18.1
Can't afford to have friends or family over for a meal once a month	7.3	23.6	-	27.7	9.0
Can't afford to have a special meal once a week	11.9	29.6	-	46.8	12.1
Couldn't pay fuel/telephone bill on time due to money shortage	9.7	18.9	26.8	31.4	4.8
Couldn't pay car registration/insurance on time due to shortage of money	3.9	7.7	10.2	13.0	0.6
Went without meals due to shortage of money	2.7	11.5	13.1	14.4	0.9
Couldn't heat or cool home due to shortage of money	2.3	5.9	5.5	14.8	1.8
Couldn't raise $2000 within a week	13.2	37.5	71.0	43.4	13.6
Sought assistance from welfare/comm. organisations due to money shortage	2.6	10.7	23.0	16.6	2.1
Sought financial help from friends/family	7.0	14.3	34.7	29.1	2.4
Saving is not a main emergency money source for the HH	33.3	59.3	-	73.0	28.5
Unable to save money most weeks	55.3	72.3	-	88.2	60.6
HH standard of living worse than 2 years ago	23.7	34.7	-	54.7	26.2

Source: Authors' calculations from the 2015–16 HES. For Indigenous households data were sourced from the 2014-15 National Aboriginal and Torres Strait Islander Social Survey.

2 x higher than All HH ≥ 3 x higher than All HHs

The **INCOME GAP i.e. THE COST OF DISABILITY**, for the 2.75 million Australian households with a family member with disability is estimated at **$15.33 BILLION PER YEAR**.

The extra costs faced by the 715,000 households with members with disability receiving the **DSP** total **$6.80 BILLION PER YEAR**, and **$2.87 BILLION PER YEAR** for 161,000 households with members with disability receiving the **NSA**.

THE COST OF DISABILITY AND NEED FOR COMPENSATION

Table 4 presents the results of the analysis of the income gap between households with at least one member with disability and households with no family member with disability (see Appendix B for additional statistics).

Overall, households with adults[22] with disability need on average an additional $107 a week over and above their net (disposable) income (including benefits received) to obtain the same standard of living of similar households without an adult with disability. When the sample is split by marital status (single and couple),[23] then couple households need a higher net income to meet the same SoL of their counterparts than single adult households. Specifically, the former group of households needs an extra $152 per week, compared to an additional $46 found among the latter group.

Table 4 also shows, not unexpectedly, the more severe the disability, the larger the income gap i.e. the greater need for compensation. Households with members having profound/severe disability need on average an extra $173 per week to reach the same SoL as similar households with no adult with disability at a total annual cost of $8.90 billion. For couple households, the weekly cost of severe/profound disability is over $110 higher than the cost borne by couple households with members having mild/moderate disability.

When households with members with disability who are reliant on income support from Government are considered then those in receipt of the Age Pension, on average, require an additional income of $122 per week, giving a total annual cost burden of $6.27 billion. The level of compensation is higher at $183 per week for those households with a member receiving the DSP and a staggering income gap of $343 for the 'partial capacity to work' NSA households, reaching $489 for NSA couple families. These costs of disability reflect differences in the age of family members in the different household groups and the sources and levels of their income – those on the Age Pension typically being retired and the DSP and NSA households being dominated by households headed by middle-aged people (with around 60% aged between 45 and 64 years, see Table A1 in Appendix A). In all cases, a much greater cost of disability is again observed among couples (far more than double the income gap for single households), implying a high cost of informal caregiving and the impacts of structural barriers on the whole family.

22. Adult in this analysis refers to people aged 16 years or above.

23. Single status means a single person, or a single parent who lives with their dependent children, independent children and/or relatives. Couple status means a couple without children, or a couple living with their dependent children, independent children and/or relatives.

Table 4. Cost of disability among households with at least one adult member with disability (2015-16)

All Households	All HHs	Single HHs	Couple HHs
I. Number of Households			
No. of HHs with at least one member with disability	2,754,918	1,058,238	1,696,680
- have profound/severe disability	988,914	282,526	706,388
- have mild/moderate disability	2,000,200	804,867	1,195,332
HHs with members with disability receiving DSP	714,626	297,264	417,362
HHs with members with disability receiving NSA	161,011	66,121	94,890
HHs with members with disability receiving AP	988,433	428,349	560,083
II. Inequality in Standard of Living – average gap in income ($ per week per household) *			
HHs with at least one member with disability	107	46	152
- have profound/severe disability	173	60	233
- have mild/moderate disability	87	41	122
HHs with members with disability receiving DSP	183	93	277
HHs with members with disability receiving NSA	343	176	489
HHs with members with disability receiving AP	122	39	187
III. Cost of Disability in Australia ($ million per year)+			
HHs with at least one member with disability	**15,328.4**	**2,531.3**	**13,410.6**
- have profound/severe disability	8,896.3	881.5	8,558.6
- have mild/moderate disability	9,048.9	1,716.0	7,583.2
HHs with members with disability receiving DSP	**6,800.4**	**1,437.6**	**6,011.7**
HHs with members with disability receiving NSA	**2,871.8**	**605.1**	**2,412.9**
HHs with members with disability receiving AP	6,270.6	868.7	5,446.2

Source: Authors' calculations from the 2015–16 HES. DSP= Disability Support Pension, NSA =Newstart Allowance, AP=Age Pension.

Notes: * Gaps in income are calculated from our models using unweighted numbers of households; + Costs of disability in Section III are calculated by multiplying number of households (Section I) with average compensating variation (gap in income) per household (Section II) and then annualised. The cost of disability of single and couple households do not sum to all households because of rounding and weighting issues. The cost of disability of households with profound/severe disability and with mild/moderate disability do not sum to the cost of disability for households with at least one member with disability because some households have more than one member with disability (Section I).

A higher proportion of household budgets is typically spent on medical and health care by households with members with disability compared to those with no member with disability. This reflects greater use of prescribed and over-the-counter medications, other pharmaceutical products, alternative therapies and treatments; first aid supplies, therapeutic appliances and equipment; more visits to GPs, specialist medical practitioners, allied health professionals and dentists; using hospital or other support services etc. Information on household expenditure on healthcare goods and services is available in the HES. Therefore, it was also possible to estimate the income required to overcome existing income gaps between the matched households removing the direct costs that families pay for medical and health care. The results are presented in Table 5.

The impact of removing household expenditure on medical and healthcare goods and services on the cost of disability is explained in Vignette 2. Vignette 2 describes the expenditure of two hypothetical single Mum households - Abbie who has a severe disability and Aisha.

Vignette 2 – Abbie & Aisha

Abbie is a single mum who lives with her two young children. Abbie is now in her early 30s. Two years ago she was in a motor vehicle accident and incurred severe injuries. Abbie has just started to work one afternoon (3 hours) a week in the local library. However, the longterm effects of her injuries means Abbie still has a limited capacity to work, and she is still reliant on the DSP for most of her income.

Through her youngest child's preschool, Abbie met Aisha. Aisha is also a single mum with two children the same age as Abbie's. Aisha also struggles financially as a single mum, even though she works four days a week as a client services officer in a large Government department. Abbie and Aisha get paid the same hourly rate of $25.34, and both former partners provide a similar amount of money for child support.

Abbie is currently getting $926.20 per fortnight from the DSP – this is the maximum basic rate plus the maximum pension and energy supplement. The amount Abbie earns over a fortnight from working at the library is below the cut-off that would affect her DSP.

Because Abbie and Aisha have different sources and levels of income, pay different amounts in income tax and Medicare, and receive different family welfare benefits and tax offsets, the two families have very different disposable incomes. Overall, Abbie has a weekly disposable income of $798 and Aisha $1,040. **The gap in their weekly disposable income is $242. This is the 'cost of disability' for Abbie's family when compared with Aisha's family**.

Abbie and Aisha are very careful with their household spending. Neither Abbie nor Aisha can afford private health insurance and when they or the children need to see a doctor they try to go to the local surgery where the GPs bulk-bill. Over a year, Aisha's spends $38 a week on average on medical and health care for the family. This is her out-of-pocket expenditure after she receives any subsidies or benefits.

With her chronic pain and other medical and health needs, Abbie spends more of her household budget on seeing doctors and allied health professionals, buying prescribed and over-the-counter medicines and other pharmaceutical products and aids. Abbie's out-of-pocket expenditure on medical and health care for herself and the children averages $72 per week. This means after paying for medical and health care costs, Abbie's family has $726 per week ($798 - $72) to spend on other household expenditure items and Aisha's family $1,002 ($1,040 - $38). **When medical and health care costs are excluded from the two families' disposable income, the gap between their incomes increases to $276 i.e. Abbie's family needs $276 per week more to have the same standard of living as Aisha's after taking into account household spending on medical and health care.**

Table 5. Cost of disability excluding healthcare costs among households with at least one adult member with disability (2015-16)

Type of Household	All HHs	Single HHs	Couple HHs
I. Number of Households			
No. of HHs with at least one member with disability	2,754,918	1,058,238	1,696,680
- have profound/severe disability	988,914	282,526	706,388
- have mild/moderate disability	2,000,200	804,867	1,195,332
HHs with members with disability receiving DSP	714,626	297,264	417,362
HHs with members with disability receiving NSA	161,011	66,121	94,890
HHs with members with disability receiving AP	988,433	428,349	560,083
II. Inequality in Standard of Living - average gap in income excluding direct healthcare costs ($ per week per household) *			
HHs with at least one member with disability	119	49	170
- have profound/severe disability	180	60	243
- have mild/moderate disability	103	47	146
HHs with members with disability receiving DSP	180	85	277
HHs with members with disability receiving NSA	344	177	489
HHs with members with disability receiving AP	128	39	197
III. Cost of Disability in Australia ($ million per year)+			
HHs with at least one member with disability	**17,047.4**	**2,696.4**	**14,998.7**
- have profound/severe disability	9,256.2	881.5	8,925.9
- have mild/moderate disability	10,713.1	1,967.1	9,075.0
HHs with members with disability receiving DSP	**6,688.9**	**1,313.9**	**6,011.7**
HHs with members with disability receiving NSA	**2,880.2**	**608.6**	**2,412.9**
HHs with members with disability receiving AP	6,579.0	868.7	5,737.5

Source: Authors' calculations from the 2015–16 HES. DSP= Disability Support Pension, NSA =Newstart Allowance, AP=Age Pension.

Notes: * Gaps in income are calculated from our models using unweighted numbers of households; + Costs of disability in Section III are calculated by multiplying number of households (Section I) with average compensating variation (gap in income) per household (Section II) and then annualised. The cost of disability of single and couple households do not sum to all households because of rounding and weighting issues. The cost of disability of households with profound/severe disability and with mild/moderate disability do not sum to the cost of disability for households with at least one member with disability because some households have more than one member with disability (Section I).

When household expenditure on medical and healthcare goods and services is excluded from the comparison of household spending then the **INCOME GAP i.e. THE COST OF DISABILITY**, for the 2.75 million Australian households with a family member with disability increases to an estimated **$17.05 BILLION PER YEAR**.

However, the extra costs faced by the 715,000 households with members with disability receiving the **DSP** reduces slighlty to **$6.69 BILLION PER YEAR**, and remains around **$2.88 BILLION PER YEAR** for 161,000 households with members with disability receiving the **NSA**.

When net healthcare expenses (out of pocket expense after any subsidy) are excluded from the calculations, the cost of disability overall was found to be higher by $12 per week (or $624 per year) or $3 for single adult households but $18 per week for couple households. This increase in the cost of disability occurs because households with the same characteristics but with no family member with disability, on average, have higher incomes and spend less on healthcare goods and services. This means the gap in income available for households to spend on all other goods and services widens. However, the weekly income gap for households with a family member receiving the DSP reduces slightly from $183 per week to $180 and increases only by one dollar for those families with a member with a disability on NSA. Removing expenditure on medical and healthcare goods and services has the greatest impact on older households who have a family member with disability receiving the age pension.

To ensure the results presented in Tables 4 and 5 were robust, several sensitivity checks were undertaken, including differences in how the SoL Index was constructed and different matching parameters for the households. All estimates aligned well, suggesting the findings presented above are robust. Appendix C gives the details of these sensitivity analyses.

MODELLING OF THE POLICY OPTIONS

In the first proposal, the base rates of the DSP are increased to compensate for the household income gap in standard of living i.e. the cost of disability. As reported above, the cost of disability using the 2015–16 HES data on average was around $46 per week for single adult households and $152 per week for couple households. Inflating these income gaps from 2015-16 to 2018-19 and rounding these estimates up to the nearest five dollars means the current cost of disability averaged across all households with at least one adult member having disability is $50 per week for a single adult household and $155 per week for a couple household. In policy option 1, the DSP is therefore increased by $100 per fortnight for a single person and $310 per fortnight for a couple in a household.

This level of additional income support is based on the overall mean income gap (compensation variation) observed for all households with and without adult members with disability. Although the income gap of $46 per week for single adult households and $152 per week for couple households fall within the 95% confidence intervals for the income gaps for households with members receiving the DSP (see Appendix B), it will not fully compensate families on the DSP for existing differences in standards of living with matched households. It is, however, in keeping with the overall objective of the DSP (or age pension) to provide income support as a safety net for those unable to fully support themselves, and that the budgetary impact of the policy proposal will be realistic.

In the second policy option, the current maximum basic DSP rate of $843.40 for a single person and $635.90 for each member of a couple are maintained but the coverage of DSP is increased so that more people would benefit from the scheme. The new recipients are drawn from the non-DSP recipient population based on their likelihood to receive the DSP if eligibility criteria changed. In the modelling, individuals with similar characteristics to existing DSP beneficiaries are selected to become 'new' DSP recipients. The likelihood a person becomes a DSP recipient was estimated using a probit regression model which takes into account people's age, gender and the presence and severity of disability. The number of additional DSP beneficiaries, however, is not unconstrained but rather the modelling is calibrated to ensure the total budgetary impact of both policy options is comparable. Persons with disability were continued to be selected to be DSP recipients until the increase in the cost of the DSP matched the cost of option 1. This scenario could represent allowing individuals with a partial capacity to work to shift back from the NSA to the DSP.

Marie's Story

Marie is 49 years old and has worked as a cleaner since she was 18 years of age. She has worked in a range of jobs as a hospital cleaner. The job entails working long hours. In the last 10 years she has developed lower back pain affecting her mobility and causing severe constant pain. She is no longer able to work as she can no longer sit for extensive periods of time, nor undertake heavy duties. Her doctor has written several reports for Centrelink to explain her disability and its level of severity. Her doctor has also been on a telephone interview with Marie to explain her medical history to the Centrelink doctor. Despite this, Marie does not qualify for the DSP, even though she lives with severe pain, has significantly impaired mobility as a result of long years of working as a hospital cleaner. Marie waited almost 18 months to be told she does not qualify. She is in severe financial stress.

As Marie lives in a small regional town she is unable to get work, of any kind, as there are few jobs available. Jobs that are available she is unable to do because of her impairment. Marie finds the fortnightly management of her Newstart payment confusing and the reporting requirements expensive. She needs to get a bus to and from the offices for reporting as she lives on the outskirts of town. Buses are infrequent. This means when she catches the bus, she has to wait for hours at the Centrelink office before and after her reporting. This increases the severity of physical pain she experiences and worsening her mobility. Even though Marie has worked for more than 20 years, paying her taxes, she is now accessing her superannuation to subsidise the cost of very basic living. She often only has one meal a day, consisting of bread and jam with a cup of tea. This situation of distress is increasingly affecting her mental health and she is becoming severely depressed.

Under option 1, it is estimated that the policy change will incur a net cost of around $3.1 billion annually in additional government expenditure. In other words, to reduce the income gap for households already receiving the DSP by half (compared with households in the general population who do not a family member with disability) would cost the Australian Government an additional $3.1 billion a year. This extra expenditure would increase the overall cost of the DSP ($16.7 billion is expected to be spent on the DSP in 2018-19) by 18.6%. Under the modelling of option 1 the number of DSP beneficiaries increases marginally by 2.7% (less than 20,000 persons). These individuals include those who are working a small number of hours per week but are not entitled to the DSP under the existing arrangements but become eligible for a part-pension under the policy change.

To model option 2, the fiscal impact is assumed to be the same as for option 1, so the number of new DSP recipients was increased until the additional cost of the payments reached $3.1bn. In terms of coverage, under this scenario the number of DSP recipients increased by around 280,000 persons, an increase in current DSP beneficiaries by 37.3%. This means the DSP would provide income support for over 1 million Australian adults with disability. This could include all the NSA 'partial capacity to work' recipients plus an additional 80,000 working age adults with disability who are not currently receiving income support through either the DSP or NSA.

Table 6 shows the impact of the two policy proposals on the rate of poverty in Australia. When the two options are compared, the second proposal has a slightly stronger impact in terms of reducing the poverty rate nationally and across broad demographic groups in the population. Australia's national poverty rate of 13.7% would decline by 0.5 and 0.6 percentage points under option 1 and 2 respectively. Because of the impacts at the household level, there are reductions – although slight - in the proportion of both children and older adults living below the poverty line.

Among all Australian adults who have mild, moderate, severe or profound disability, the poverty rate reduces from 17.5% to 15.8-15.4% under option 1 and 2. Option 1 has a significant impact on poverty reduction among DSP recipients with the proportion of DSP recipients living below the poverty line dropping from 17.8% to 9.7% (reflecting the increase in benefit and 50% reduction in the income gap). An unexpected finding of the second policy proposal is that the poverty rate in DSP recipients appears to increase. This is largely driven by the inclusion of new people with disability who are already living in poverty e.g. the partial capacity to work group and going on to the DSP is still not sufficient to raise many of these individuals out of poverty.

Table 6. Impact on poverty in key demographic groups

Demographic Group	Poverty Rate (baseline)	Policy Option 1	Percentage Point Difference 1	Policy Option 2	Percentage Point Difference 2
National	13.7	13.3	−0.5	13.1	−0.6
Child (⩽15 years)	18.4	18.1	−0.2	17.9	−0.5
Elderly (⩾65 years)	11.6	11.5	−0.1	11.3	−0.3
Individuals with disability*	17.5	15.8	−1.7	15.4	−2.1
DSP recipients	17.8	9.7	−8.1	18.6	0.8

* *includes persons with mild, moderate, severe or profound disability.*

Table 7 shows the impact of the two policies on measures of income inequality in Australia. Comparing the two policy options, the second proposal has a stronger impact on improving the gap between the richest and the poorest Australian households. This is shown by the Gini coefficient but particularly in terms of the ratio of households at the 90th income percentile compared with those at the 10th income percentile (P90/P10 ratio) which is not surprising as receiving the DSP will have a stronger impact on those in low-income groups. Neither policy impacts households in higher income groups and hence there is no change in the upper income distribution as shown by the P90/P50 ratio (households at the 90th income percentile compared with those at the median).

Table 7. Changes in Income Inequality

Inequality Measures	Baseline scenario	Policy Option 1	Percentage Point Difference 1	Policy Option 2	Percentage Point Difference 2
Gini coefficient	0.3366	0.3340	−0.0026	0.3341	−0.0025
P90/P10	4.29	4.24	−0.05	4.05	−0.24
P90/P50	2.06	2.06	−0.00	2.06	−0.00
P75/P25	2.17	2.11	−0.06	2.15	−0.02

Source: Authors' calculations from the 2015–16 HES.

Notes:

1. Gini coefficient ranges from 0 to 1 in which zero indicates perfectly evenly divided incomes and 1 indicates all income is held by a single (type) household
2. P90/P10 ratio of income at the 90th vs 10th percentile, P90/P50 ratio of income at the 90th vs 50th percentile, and P75/P25 ratio of income at the 75th vs 25th percentile.

In the previous results section, the level of compensation for the cost of disability for households with a member with disability was identified. How does this translate to changes in household disposable income across different income groups within the broader population? Tables 8 and 9 provide estimated average changes in household disposable income ($ per week) under the first and second proposed policy options. Under the first policy change, 5.6% of Australian households benefit from the policy change (who gain at least one more dollar per year), no household loses as a result of the policy, and 94.4% of households are not affected. This contrasts with Table 9, where under proposal 2, 1.8% of Australian households benefit from the policy change (who gain at least one more dollar per year), zero lose as a result of the policy change, and 98.2% are not affected.

Both proposals have the strongest gain for those in low-income households. The average household disposable income for low-income households (less than $250 per week) increased by $28.70 per week under the first proposal (see Table 8). This gain is slightly higher than the gain from the second proposal ($25.33 per week), as shown in Table 9.

There are some differences in terms of benefits gained across different household types. Single adults and single parents in low-income households benefit more from the second policy option than the first proposal while couples (with or without children) benefit more from the first option than the second option. This reflects likely differences in the current composition of the DSP recipient population and what would be the new composition under policy option 2 e.g. having the partial capacity to work group return to the DSP.

Table 8. Estimated average changes in disposable income ($ per week) for all Australian households under the first policy option

Weekly household income	Single	Single parent	Couple only	Couple with children	Total
< $250	9.3	4.76	22.22	53.65	12.89
499	1.13	3.99	10.82	14.4	4.04
749	0.38	0	5.53	13.48	2.07
$750–999	0	0.13	5.62	1.94	0.96
1,499	0.07	0	3.28	3.19	0.91
1,999	0	0.36	0.58	0.67	0.31
2,499	0	0	0.02	0.41	0.16
2,999	0	0	0	0.04	0.02
3,999	0	0	0	0.48	0.21
$4,000+	0	0	0	0.32	0.17
Total	**3.28**	**2.82**	**6.71**	**5.61**	**4.34**

Table 9. Estimated average changes in disposable income ($ per week) for all Australian households under the second policy option

Weekly household income	Single	Single parent	Couple only	Couple with children	Total
< $250	11.81	27.35	3.19	8.90	11.90
499	4.94	22.66	3.53	0.09	5.02
749	1.17	3.90	1.11	9.75	1.75
$750–999	0.19	0.08	6.91	1.72	1.28
1,499	0.28	2.51	3.84	2.14	1.16
1,999	1.48	0.55	0.26	0.35	0.88
2,499	0.00	0.00	0.11	0.56	0.25
2,999	0.00	0.00	0.00	3.68	1.77
3,999	0.00	0.00	0.00	0.64	0.28
$4,000+	0.00	0.00	0.00	0.00	0.00
Total	**4.71**	**16.64**	**2.04**	**1.96**	**4.32**

Frank's Story

Frank is a 55 year old Aboriginal man, who worked as a self-employed plasterer for 30 years. Frank developed scoliosis and disc disease, calcified Achilles tendinosis, anxiety and depression, bilateral shoulder dysfunction and obesity, with a BMI of almost 60. Since 2015 Frank's physical and mental health began to severely impact his ability to work. Despite diagnosis and treatment, his conditions did not improve.

In December 2015 Frank lodged a DSP claim. A year later that claim was rejected, and he appealed to the Administrative Appeals Tribunal (AAT) by himself but was unsuccessful. In March 2017, Frank applied for DSP again but his claim was rejected again. In 2019 Frank was represented by a lawyer from an independent community legal centre which specialises in social security (Centrelink) issues. Frank and his lawyer appealed to the AAT and the government lawyers settled the claim before it went to a hearing. Frank was found eligible for the DSP as of 2017 and received more than $11,000 in arrears.

Frank says that 5 years of frustration and being treated like a second-class citizen has finally come to an end. He feels relieved but is still confused about why he had to go through the ordeal.

In terms of spatial distribution, the first policy option benefits regions where current DSP recipients live while the second proposal is likely to benefit the suburbs of cities where a large proportion of the 'new' DSP recipients would be drawn from. Figures 7 and 8 map the effects of the proposals on poverty reduction at the local community (suburb) level (ABS statistical area 2 - SA2). The reduction is measured as the percentage point difference between an area's current poverty rate and the rates under each scenario, recalling that at a national level the poverty rate decreased by 0.5 percentage points under policy option 1 and 0.6 under policy option 2. The red areas are likely to experience a higher reduction in the poverty rate should the proposal be implemented, and the blue areas are less affected. Appendix E provides details of the expected reduction in poverty for each community under the 2 policy options.

Under option 1, the largest reductions in poverty occurred in the local mining and agricultural rural communities of Clermont, Millmerran, Collinsville, Miles–Wandoan and Inglewood–Waggamba, all of which are located in Queensland. The reduction was greater than 5 percentage points in these areas. In terms of policy option 2, the five areas estimated to have the greatest reduction in poverty were 5 communities in Tasmania – Ravenswood, St Helens–Scamander, New Town, West Coast (Tas.) and Glenorchy where the reduction in poverty was 2.5 percentage points or higher.

Figure 7. Spatial Distribution of Poverty Reduction under Policy Option 1

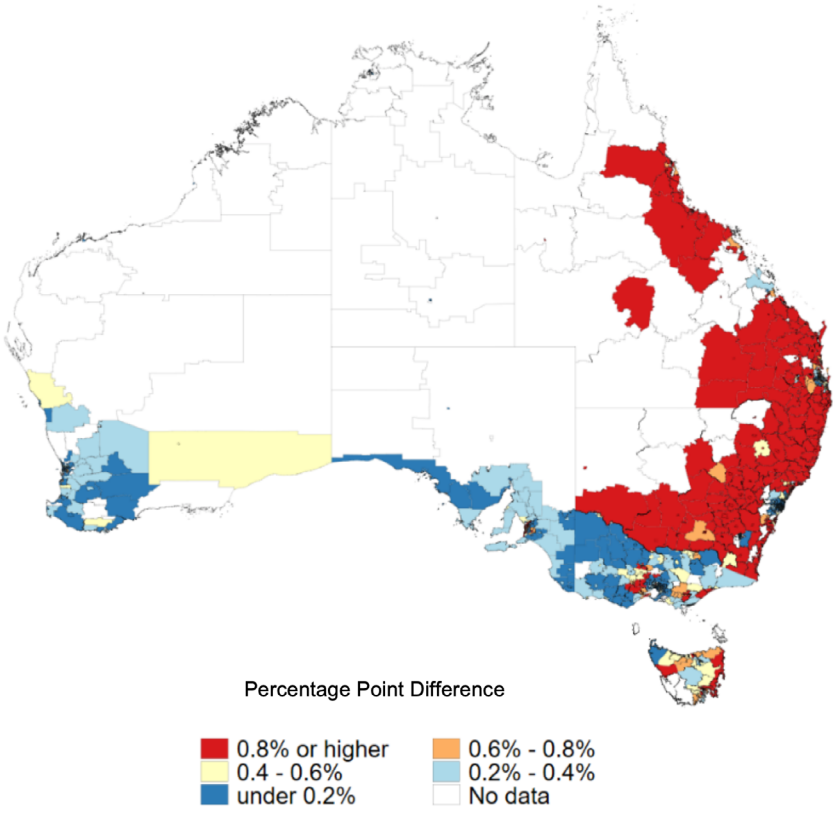
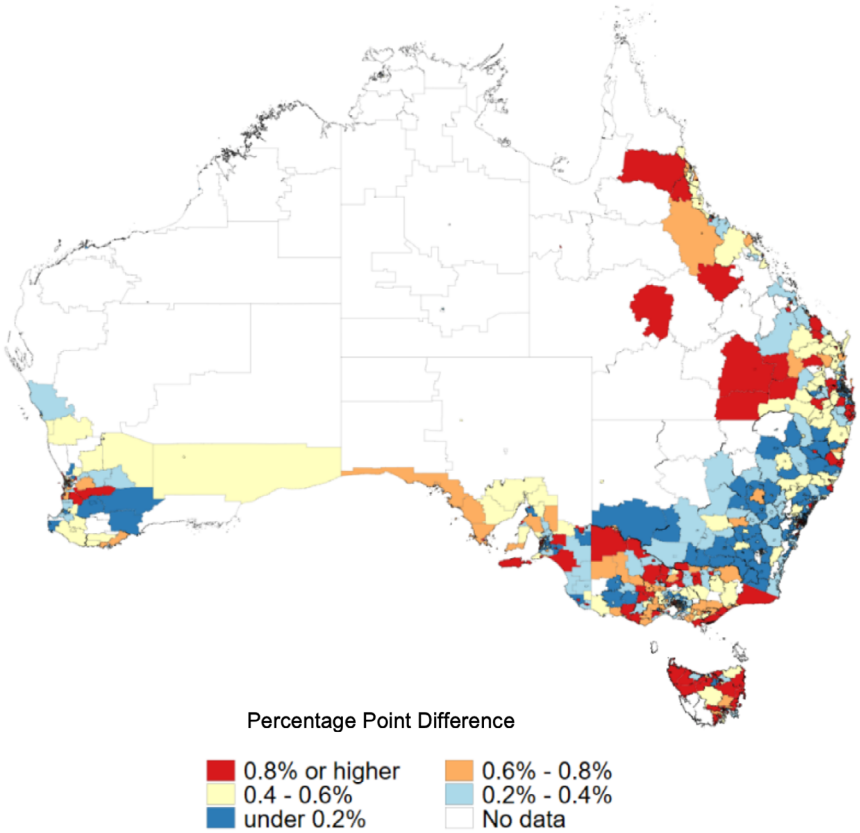


Figure 8. Spatial Distribution of Poverty Reduction under Policy Option 2



7. CONCLUSIONS AND POLICY IMPLICATIONS

There is very little quantitative evidence on the cost of disability imposed on households with a member with disability in Australia. To the best of our knowledge, this is the first Australian study to apply the Standard of Living (SoL) approach where households with a member with disability are matched to households with similar characteristics but who have no member with disability. Using this approach, the extra income households with at least one member with disability need to achieve the same standard of living with matched households was identified.

Sixteen measures of financial insecurity and hardship were used to construct an Index of Standard of Living. On all 16 indicators the difference in the proportions answering yes to experiencing financial vulnerability between households with a member with disability and in receipt of either the Disability Support Pension (DSP) or Newstart Allowance (NSA) and all Australian households was alarming. Although nearly one in four Australian households thought their standard of living was worse than 2 years previously, over a third of households with a person with disability on the DSP thought their standard of living had dropped and a staggering 55% of those receiving NSA.

In line with findings from other countries, the cost of disability was found to be substantial with major gaps in household income and standards of living. The income gap i.e. the cost of disability, for the 2.75 million Australian households with a family member with disability was estimated to $15.33 billion in 2015-16.

The extra costs faced by the 715,000 households with members with disability receiving the DSP totalled $6.80 billion per year, and $2.87 billion per year for the 161,000 households with members with disability receiving the NSA.

Using the 2015–16 HES, households having at least one member with disability were found to need an extra $107 per week, or approximately a 10% increase in their disposable income, to reach the same SoL of comparable households. A slightly higher cost (an additional $12 per week or $624 per year per household) was estimated when healthcare expenses were removed from the household income measure. The matched households with the same characteristics but with no family member with disability, on average, have higher incomes and spend less on healthcare goods and services. Therefore, when expenditure on healthcare is taken into account the gap in income available for the different households to spend on all other goods and services widens. As the income measure used in the modelling includes existing transfer payments and benefits, the significance and positive signs of the compensating variations estimated means the estimated gaps in income can be confidently taken as accurately representing the amount by which families with disability are being under-compensated under the current social welfare benefit arrangements.

The barriers faced by individuals with severe and profound disability and their families are substantial. Therefore, it is not surprising that these families experience a substantial cost burden. Under the existing income support system, households with members with severe or profound disability and on the DSP need an additional benefit of $173 per week to obtain the same SoL as a family having no adults with disability. For couple households, this cost is almost $110 higher than for families with members with mild/moderate disability, implying adverse spillover costs for the whole family.

In keeping with the impact suggested in the NATSEM 2005 report, the transition of people with disability and a partial capacity to work onto the Newstart Allowance has resulted in major reductions in standard of living. The modelling shows that single adult households where the adult has disability and is receiving NSA need an extra $352 per fortnight and couple households $978 per fortnight to have the same standard of living as similar households without an adult with disability. The current fortnightly payment under NSA for a single person (aged

›22 years) with no children is $555.70 and for couples $1,003.40 ($501.70 each). Thus, for households with adults with disability on NSA to have the same standard of living as similar households where no adult member has disability would require a 63.7% increase in the NSA fortnightly payment for single adults with disability and almost a doubling (97.5%) for partnered adults. The findings presented in the Report are robust as shown by different robustness checks.

The impact of the two policy options modelled on reducing poverty and income inequality was assessed. First, the rate of the DSP was increased to offset the extra cost of disability so that the gap in standard of living between recipients of the DSP and similar households without an adult with disability would be halved. The current eligibility criteria of the DSP remained unchanged. The second policy option extended the coverage of the DSP scheme, where some of the people with disability but who are not recognised in the current DSP scheme may be eligible for a DSP payment - such as allowing the partial capacity to work NSA recipients to return to the DSP. The number of additional DSP recipients was capped to make the two scenarios comparable in their total budgetary impact to Government.

Both policy proposals would require additional government expenditure of around $3.1 billion per annum. This would close the gap in income by nearly 50% as the current total annual cost of disability for households with a family member receiving the DSP is estimated to be $6.8 billion. However, as the findings show, this investment under both proposals would reduce poverty rates and improve inequalities in the income distribution at the population level. The improvement in income inequality is stark among Australia's low-income households, which is not unsurprising given that there is a higher concentration of DSP recipients in low-income households. The second proposal would extend the coverage of the DSP by 37.3% such that the DSP could provide income support to over 1 million Australian adults with disability, including all the partial capacity to work NSA recipients.

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APPENDIX A - METHODS

HOUSEHOLD EXPENDITURE SURVEY

In HES dwellings were selected through a stratified and multi-stage cluster design from the private dwelling framework of the ABS Population Survey Master Sample. These selections were distributed across 12 months, making the survey results representative of income and expenditure patterns across the year.

INCOME MEASUREMENT

Net income after taxes and benefits i.e. disposable income was used. Ideally, permanent income would be used rather than reported income which is likely to include errors in measurement and a transitory component associated with other reasons rather than disability. However, as suggested by Zaidi and Burchardt (2005), we have no reason to believe that the income of households with and without members with disability will be measured with a different level of error. As our estimates depend on a comparison between these two, we can reasonably expect any systematic bias as a consequence of measurement error.

THE DISTRIBUTION of the SoL INDEX and Its COMPONENT'S CONTRIBUTION

The 16 indicators used allows for variations in preferences to explain non-consumption rather than assuming that non-consumption always implies material deprivation (Morciano, Hancock, and Pudney 2015). The SoL composite index was constructed using the Multiple Correspondence Analysis (MCA) approach. MCA is one of the 'data reduction' procedures which converts observations of possibly correlated variables into values of linearly uncorrelated variables called principal components such that the first principal component has the largest possible variance to account for as much of the variability in the data as possible.

Generally, MCA is part of a family of descriptive methods including PCA, clustering, and factor analysis, which reveal patterns of complex datasets (Costa et al. 2013). However, PCA is usually designed for continuous variables. For dummy variables, PCA requires linear constraints with an assumption that the distances among categories are the same and the categories are ordered. This issue is solved by MCA, a technique that is similar to PCA but requires fewer assumptions on the distributions of indicator variables, therefore is better suited to categorical or discrete variables (Blasius and Greenacre 2006).

Specifically, MCA is used to represent and model datasets as 'clouds' of points in multidimensional Euclidean space (i.e. it locates each item as a point in a low-dimensional space, and if items become more similar in distribution, the distance between them becomes closer in space). Therefore, this method provides key insights into the relationship between categories without needing to meet assumption requirements (Aktürk, Gün and Kumuk, 2007). In this report, all of our SoL items are binary dummy variables; therefore, the MCA technique is applied using the weighted linear function:

$$S_i = \sum_j R_{ij} W_j \ (1)$$

where S_i is the composite index measuring the SoL of household $\mathbf{i}$

R_{ij} is the response of household $\mathbf{i}$ to item $\mathbf{j}$

W_j is the MCA weight for the first component assigned to item j, and total weights $\sum_j W_j = 1$.

Then, we re-scale the indicator S to ensure it ranges from 0 to 1.

The first principal component, as an outcome of this method, explains most of the variations of the indicators, with 93.2% of inertia, supporting the use of this component as a SoL composite index. Table A1 (column 4) reports weights of each indicator (R_{ij} in equation (1)) or its contribution in the composite index. The signs of these weights meet our expectation where negative weights are demonstrated if items cannot be afforded by families and positive weights otherwise. These results confirm the quality of the estimated Living Standards Index.

Table A1. Indicators to estimate Living Standards Index: Distribution and Weights

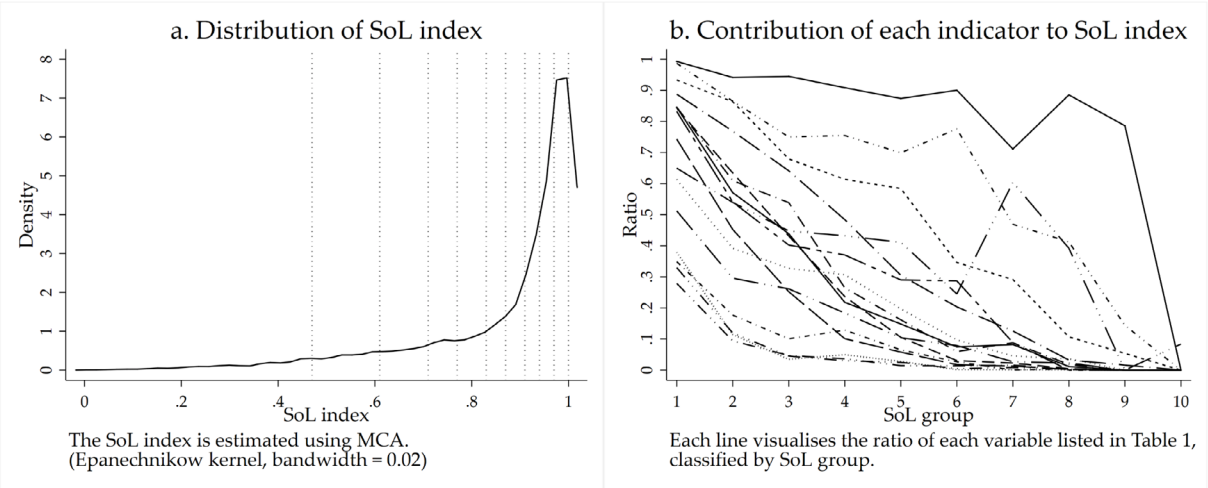
Variable	Category	Proportion	Weights
Can't afford to buy new clothes most of the time	Yes	11.7%	−5.417
	No	88.3%	0.718
Can't afford to spend time on leisure or hobby activities	Yes	12.0%	−5.662
	No	88.0%	0.772
Can't afford a holiday away from home for at least 1 week a year	Yes	24.5%	−3.567
	No	75.5%	1.161
Can't afford to have a night out once a fortnight	Yes	18.2%	−4.471
	No	81.8%	0.997
Can't afford to have friends or family over for a meal once a month	Yes	8.4%	−6.361
	No	91.6%	0.58
Can't afford to have a special meal once a week	Yes	13.7%	−5.152
	No	86.3%	0.82
Couldn't pay fuel/telephone bill on time due to shortage of money	Yes	9.8%	−5.067
	No	90.2%	0.551
Couldn't pay registration/insurance on time due to shortage of money	Yes	3.9%	−5.947
	No	96.1%	0.239
Went without meals due to shortage of money	Yes	3.0%	−7.925
	No	97.0%	0.246
Couldn't heat home due to shortage of money	Yes	2.7%	−7.12
	No	97.3%	0.194
Couldn't raise $2000 within a week	Yes	14.4%	−4.697
	No	85.6%	0.789
Sought assistance from community organisations due to shortage of money	Yes	3.0%	−7.483
	No	97.0%	0.231
Sought financial help from friends/family	Yes	7.1%	−5.298
	No	92.9%	0.406
Saving is not a main emergency money source of HH	Yes	33.9%	−2.574
	No	66.1%	1.322
HH standard of living worse than 2 years ago	Yes	25.7%	−1.93
	No	74.3%	0.667
Unable to save money most weeks	Yes	57.0%	−1.25
	No	43.0%	1.66

Source: Authors' calculations from the 2015–16 HES.Notes:

The distribution of this Index, which is adjusted to range between 0 and 1, is plotted in Figure A1a. It shows a left-skewed distribution which increases slowly before 0.8 but then rises significantly after 0.9. It is partly because about one-third of the sample had a SoL value equal to one, indicating that many families can afford all of the activities measuring living standards. Due to this skewed distribution, it is hard to get an exact match in the SoL Index between with disability and without disability groups. It is because the former tends to be associated with lower living standards compared to the latter group while the distribution on the lower part of the SoL is small. Therefore, we divide the Index into ten groups where each of the first seven explains about 5% of the sample, the eighth and ninth around 15% each and the 10th one-third of the sample.[24]

The vertical lines in the part (a) of Figure A1 indicate the division of these ten different groups. These groups are also employed in part (b) of Figure A1 to test their association with the distribution of each SoL indicator. The figure demonstrates the expected trends in almost all indicators where lower living standards (or lower group) is correlated with a higher proportion of families cannot afford an item. These groups are then applied as an exact match requirement using the nearest neighbour matching technique to identify better counterparts of the disability groups.

Figure A1. The SoL index distribution and its component's contribution



Notes: There are 10 lines (in a), equivalent to 10 SoL groups (in b) of which each in the first seven groups explains about 5% of the sample, the 8th and 9th around 15% each and the 10th one third of the sample.

Source: Our calculations from the 2015-16 HES, at household level.

24. We began with a trial dividing the sample into 20 equal sub-samples. However, the skewed characteristics result in some missing sub-samples in the high end of the distribution. Therefore, we decided to keep the first seven equal sub-samples with 5% each and groups the remaining into another three groups.

Nearest Neighbour Matching

The 'Nearest Neighbour Matching' (NNM) technique (Abadie and Imbens, 2011) was used to 'pair-up' households. This approach uses the distance between covariate patterns to define 'nearest'. We use the Mahalanobis metric, the inverse of the sample covariance matrix, to measure the distance between two covariate patterns, which solves problems with scale and covariance. This matching technique is flexible

because it does not require a functional-form assumption. This matching is implemented with replacement (i.e. a controlled household can be used more than once as a match with a with disability household), which helps increase the average quality of matching and decrease the bias compared to NNM without replacement (Caliendo and Kopeinig 2008).

Dummies are included in terms of household types, including single, single parent, couple with and without children and mixed family households. Additionally, we incorporate the characteristics of the reference person of households: age categories, educational attainment and migrant status (whether he/she was born in Australia). Furthermore, we cover family characteristics: age category of the youngest child, the number of children and the number of adults. Since people with the same level of income but differences in terms of home ownership will be expected to have different standards of living, the type of home ownership is also included. Similarly, state dummies are added to reflect geographical differences in costs of living.

To apply a non-parametric method using matching techniques, assume that the living standard $S=f(D,Y,X)$ where $D=1$ if a household has a disabled adult and 0 otherwise, Y is family income, X is observed family characteristics. If $f(.)$ is continuous and strictly increasing in income, then the inverse function $Y=f^{-1}(D,S,X)$ exists. The CV is defined as a difference between income of families with a member with disability (a with disability group) and expected income of the counterfactual circumstance when these families do not have a disabled adult: $CV=E[f^{-1}(D=1,S,X)\,|\,D=1]-E[f^{-1}(D=0,S,X)\,|\,D=1]$. As $E[f^{-1}(D=0,S,X)\,|\,D=1]$ is not observed, we need to choose a proper substitute for it from the group of families without a disabled member (a controlled group) by using a matching technique.[25] This technique does not require any assumption on model specification on f.

The location of each pair of (S,Y) in Figure A2 depends on family characteristics of both disabled and non-disabled members and can imply a non-linear instead of a linear relationship. Morciano, Hancock, and Pudney (2015) and Mentzakis (2011) show the importance of model specification in relation to the heterogeneity of parameters and the functional form. Therefore, any misspecification bias can lead to a flat shape with a possible significant overestimation of CV as a result (see Hancock, Morciano, and Pudney 2013).

We do not use many nearest neighbours for matching (or oversampling) because this method can increase the bias that results from poorer matches (Smith 1997) but a matching ratio of 1:3 will be applied for a sensitivity check.

One problem of NNM is that it faces a risk of bad matches if the closest neighbour is far away. To avoid this, we impose a tolerance level on the maximum distance (or caliper). It means that a distance from a household in the without disability group selected as a match with a with disability household needs to lie within a given range. Without a caliper, a substantial bias can be possible, and a tighter caliper can help reduce bias significantly (Lunt 2013). A caliper of 0.25 standard deviations or smaller has been recommended by Rosenbaum and Rubin (1985).

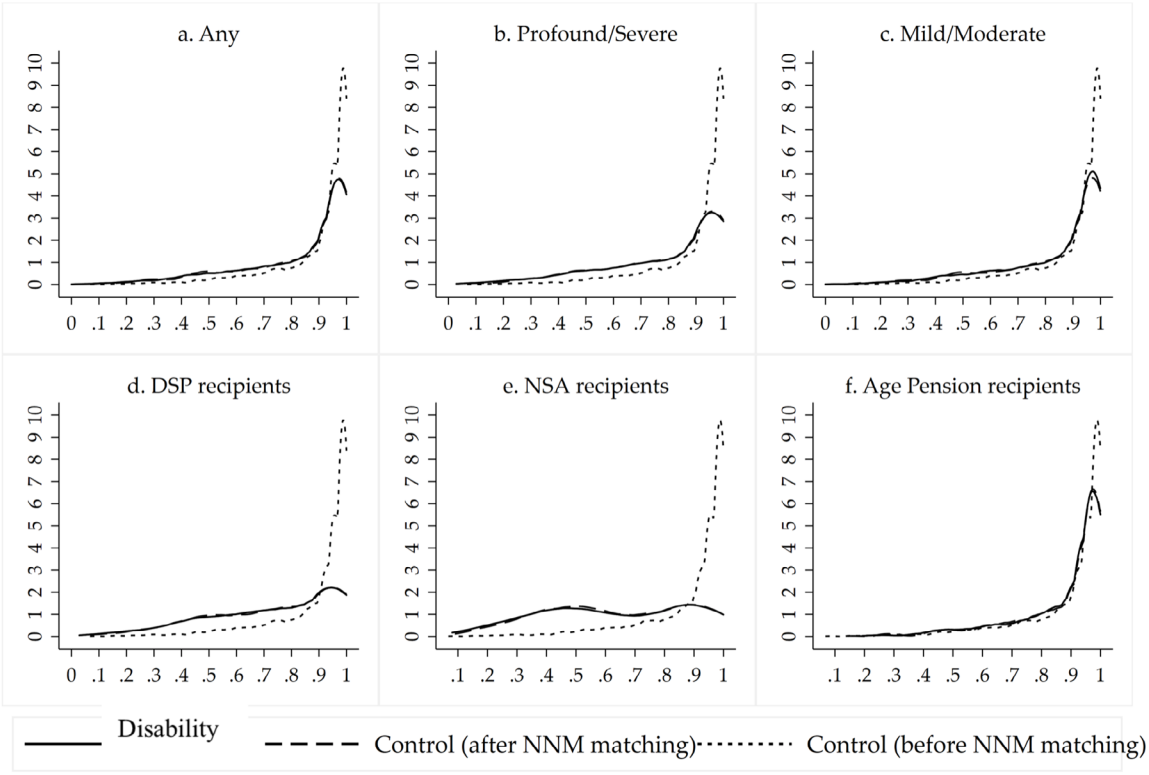
Matching Groups

We implement the NNM approach to match each family in each with disability group to one household in the without disability group based on their social, demographic and economic characteristics. However, we also allow a number of other available households without a member with disability that are very close

25. It is expected that families with lower income are more likely to have members suffering long-term disability compared to families with higher income. Therefore, including those with their members having very little chance being disabled (families with very high income) tend to over-estimate the CV.

in the distance to families with disability.[26] We match on the Mahalanobis criterion using the caliper value of 0.0001 and allow exact matches based on SoL index categories and a dummy on single status. Although we cannot meet further constraint where the continuous values of living standards should be applied, the use of SoL Index categories still secures a similar distribution of living standards between the with disability and new without disability group (see Figure A2). From this figure, we also see that without applying NNM matching, the SoL distribution of households without a member with disability is very different from the with disability groups of all four cases (Households with a member with disability, Households with members with profound/severe disability, Households with members with mild/moderate disability, and Households with members receiving DSP, NSA or Age Pension), especially at the higher end of the distribution. Households with members with disability tend to have lower living standards than their counterparts. This intuition supports our use of NNM matching techniques.

Figure A2. The SoL distribution: With disability and without disability households



Source: Our calculations from the 2015-16 HES.

26. We use the teffect nnmatch command in Stata. The command automatically gives a maximum number of control households which can be selected more than once. These numbers are 22, 17 and 19 for the three sub-groups in Table A2.

In addition to the living standard distribution, we also examined the balance in household characteristics between households with disability and without disability. Table A2 describes the characteristics of all three disability groups: households with at least one member with disability (column 1); households with at least one member with profound/severe disability (column 3); and households with at least one member with mild/moderate disability (column 5). Column (7) includes all households with members with disability receiving the DSP; Column (9) includes all households with members with disability receiving NSA; and Column (11) includes all households with members with disability receiving the Age Pension. Characteristics of all Australian households without any member with disability before matching are presented in column 13 of the Table A2. From the all Australian households without any member with disability, sub-samples were selected to match with the different household types with members with disability - Columns (2), (4), (6), (8), (10) and (12) include households without a member with disability which match the household characteristics of each group of households in Columns (1), (3), (5), (7), (9) and (11).

From Table A2, we observe that the characteristics between the three with disability groups are different from the all households without disability group (column 13). Households with members with disability tend to belong to the older generation, with 56% at the age of 65 years or over living alone or with their partners, compared to 22% from the without disability households. This ratio is even higher (60%) among households with members receiving the DSP or Age Pension.

Regarding the severity of disability, people with more severe conditions are more likely to live with their family members (80% with their partners, independent children or relatives) while nearly 40% of people with mild/moderate disability reside in one-adult families. Diversity in other characteristics also reflect the age differences between the with disability and without disability households. Some 73% of households with adult members with disability tend to be headed by a person at the age of 55 years or over (of which 53% are at retirement age and even higher (70%) among those receiving DSP or Age Pension), compared to 39% of households without disability. Therefore, the former households tend to have much fewer young children (e.g., only 3.5% of families with children under 6 years of age) compared to the latter group. Persons with disability receiving the DSP, NSA or Age Pension tend to have the lowest family income (under $900 per week on average) and those with severe/profound disability (including both households with and without receiving DSP or Age Pension) tend to face the lowest SoL Index.

Table A2. Household characteristics by disability level: households with at least one member with disability and households without disability

Type	With Disab (1)	Without Disab (2)	Severe Disab (3)	Without Disab (4)	Mild Disab (5)	Without Disab (6)	DSP Recipient (7)	Without Disab (8)	NSA Recipient (9)	Without Disab (10)	AP Recipient (11)	Without Disab (12)	Without Disab All (13)
Weekly HH disposable income (2015 AUD)	1,123	1,230	1,173	1,346	1,113	1,200	1,054	1,237	781	1,124	843	965	1,703
Weekly HH income, excl. healthcare cost	1,045	1,164	1,099	1,278	1,031	1,134	1,001	1,181	744	1,088	770	898	1,625
Score of standard of living	0.828	0.830	0.797	0.801	0.840	0.841	0.735	0.738	0.633	0.642	0.883	0.884	0.899
HH type													
- Single, aged under 65	0.135	0.134	0.113	0.113	0.130	0.129	0.326	0.322	0.278	0.273	0.000	0.001	0.152
- Single, aged 65 or above	0.191	0.195	0.102	0.108	0.212	0.216	0.028	0.038	0.000	0.005	0.375	0.378	0.109
- Sole parent w.t. dep. child. only	0.030	0.030	0.026	0.027	0.030	0.030	0.034	0.034	0.081	0.081	0.002	0.002	0.066
- Sole parent w.t. ind. child. or relatives	0.070	0.067	0.106	0.099	0.060	0.057	0.120	0.113	0.106	0.106	0.061	0.058	0.026
- Couple only, aged under 65	0.099	0.101	0.102	0.110	0.100	0.100	0.119	0.114	0.162	0.146	0.000	0.008	0.171
- Couple only, aged 65 or above	0.250	0.251	0.250	0.248	0.269	0.271	0.095	0.102	0.071	0.081	0.438	0.431	0.111
- Couple parents w.t. dep. child. only	0.073	0.077	0.084	0.085	0.066	0.071	0.073	0.076	0.106	0.121	0.003	0.006	0.250
- Couple parents w.t. ind. child. or relatives	0.094	0.089	0.138	0.131	0.084	0.079	0.131	0.126	0.086	0.076	0.074	0.072	0.068
- Mixed family HH	0.058	0.056	0.079	0.079	0.050	0.048	0.075	0.075	0.111	0.111	0.046	0.043	0.047
Age of youngest child													
- Between 0 and 5	0.035	0.042	0.036	0.044	0.032	0.039	0.031	0.044	0.045	0.071	0.003	0.006	0.149
- Between 6 and 9	0.033	0.028	0.042	0.036	0.030	0.025	0.034	0.029	0.076	0.056	0.005	0.004	0.087
- Between 10 and 14	0.040	0.037	0.045	0.039	0.037	0.035	0.046	0.037	0.076	0.076	0.012	0.010	0.066
- 15 or above	0.046	0.043	0.071	0.065	0.038	0.036	0.075	0.069	0.040	0.035	0.009	0.009	0.058
Age of reference person in HH													
- Between 25 and 34	0.054	0.082	0.060	0.087	0.046	0.075	0.064	0.109	0.086	0.157	0.002	0.015	0.208
- Between 35 and 44	0.077	0.076	0.092	0.092	0.067	0.067	0.100	0.103	0.167	0.187	0.008	0.009	0.208
- Between 45 and 54	0.156	0.155	0.182	0.182	0.141	0.140	0.250	0.257	0.263	0.242	0.017	0.027	0.195
- Between 55 and 64	0.199	0.179	0.202	0.185	0.200	0.178	0.368	0.306	0.338	0.263	0.046	0.048	0.161
- 65 or above	0.514	0.508	0.464	0.454	0.547	0.540	0.219	0.224	0.146	0.152	0.926	0.901	0.229
Number of children aged under 15 in HH	0.188	0.185	0.207	0.195	0.171	0.174	0.178	0.180	0.348	0.328	0.029	0.030	0.547
Number of adults in HH	1.898	1.862	2.141	2.086	1.843	1.814	1.959	1.918	1.955	1.889	1.763	1.742	1.920

Source: Authors' calculations from the 2015–16 HES.

Notes: SoL score is calculated based on the MCA and adjusted to range between 0 and 1. The selection is implemented using the NNM approach with the caliper value of 0.00001 given the exact matches on SoL index categories and household type (Single or not). We require a 1:1 matching ratio, of which one observation in households without disability can be matched with a minimum of one and a maximum of 22 observations in the with disability group in Column (1).

Table A2 (cont.) Household characteristics by disability level: households with at least one member with disability and households without disability

Type	With Disab (1)	Without Disab (2)	Severe Disab (3)	Without Disab (4)	Mild Disab (5)	Without Disab (6)	DSP Recipient (7)	Without Disab (8)	NSA Recipient (9)	Without Disab (10)	AP Recipient (11)	Without Disab (12)	Without Disab All (13)
Education attainment of reference person in HH													
- Graduate or post-graduate degree	0.061	0.059	0.051	0.051	0.062	0.060	0.037	0.043	0.025	0.051	0.040	0.038	0.129
- Bachelor degree	0.099	0.105	0.099	0.107	0.095	0.103	0.072	0.091	0.091	0.101	0.071	0.062	0.208
- Advanced diploma	0.106	0.093	0.100	0.093	0.109	0.095	0.094	0.095	0.066	0.111	0.088	0.084	0.123
- Certificate III/IV	0.203	0.234	0.202	0.246	0.205	0.231	0.204	0.260	0.268	0.288	0.176	0.192	0.216
- College or basic certificate	0.163	0.158	0.154	0.139	0.163	0.163	0.214	0.196	0.212	0.152	0.129	0.140	0.165
- Year 10 or below	0.368	0.350	0.393	0.364	0.366	0.349	0.379	0.315	0.338	0.298	0.496	0.484	0.160
Housing													
- Owning a house without a mortgage	0.492	0.497	0.425	0.431	0.531	0.533	0.292	0.290	0.268	0.227	0.725	0.751	0.289
- Owning a house with a mortage	0.198	0.215	0.212	0.235	0.193	0.205	0.195	0.244	0.172	0.217	0.087	0.084	0.388
- Renting a private accommodation	0.183	0.202	0.200	0.230	0.169	0.188	0.268	0.298	0.343	0.439	0.082	0.093	0.273
- Renting a social accommodation	0.126	0.087	0.163	0.104	0.107	0.074	0.245	0.168	0.217	0.116	0.106	0.072	0.050
- HH has other properties owned and rented out	0.078	0.056	0.068	0.060	0.081	0.056	0.052	0.049	0.015	0.010	0.037	0.030	0.144
Location of HH													
- New South Wales	0.210	0.246	0.203	0.258	0.209	0.240	0.196	0.248	0.207	0.283	0.224	0.260	0.232
- Victoria	0.257	0.273	0.240	0.258	0.266	0.275	0.232	0.248	0.237	0.253	0.278	0.282	0.228
- Queensland	0.135	0.137	0.149	0.144	0.130	0.138	0.150	0.162	0.141	0.177	0.134	0.128	0.154
- South Australia	0.141	0.133	0.150	0.140	0.145	0.136	0.160	0.143	0.167	0.126	0.132	0.133	0.123
- Western Australia	0.114	0.102	0.106	0.096	0.114	0.105	0.099	0.088	0.106	0.086	0.114	0.103	0.125
- Tasmania	0.103	0.075	0.109	0.074	0.098	0.074	0.131	0.088	0.106	0.051	0.088	0.074	0.063
- Northern Territory	0.018	0.015	0.013	0.009	0.019	0.017	0.007	0.006	0.010	0.010	0.015	0.010	0.041
- Australian Capital Territory	0.022	0.018	0.029	0.021	0.019	0.016	0.025	0.018	0.025	0.015	0.014	0.011	0.033
Migrant status of reference person in HH													
- Born in Australia	0.679	0.664	0.682	0.640	0.679	0.667	0.732	0.692	0.687	0.657	0.614	0.603	0.657
- Not born in Australia	0.321	0.336	0.318	0.360	0.321	0.333	0.268	0.308	0.313	0.343	0.386	0.397	0.343
Number of adults in HH	1.898	1.862	2.141	2.086	1.843	1.814	1.959	1.918	1.955	1.889	1.763	1.742	1.920

Source: Authors' calculations from the 2015–16 HES.

Notes: SoL score is calculated based on the MCA and adjusted to range between 0 and 1. The selection is implemented using the NNM approach with the caliper value of 0.00001 given the exact matches on SoL index categories and household type (Single or not). We require a 1:1 matching ratio, of which one observation in households without disability can be matched with a minimum of one and a maximum of 22 observations in the with disability group in Column (1).

Compensating Variation

Different statistical strategies have been applied in the literature to estimate the cost of disability based on SoL and income. These approaches range from parametric methods, including an Ordinary Least Squares model (Loyalka et al. 2014), an ordered logit/probit model (Zaidi and Burchardt 2005; Loyalka et al. 2014; Saunders 2007; Cullinan, Gannon and Lyons 2011), or a structural equation model (Morciano, Hancock and Pudney 2015), to non-parametric methods using matching techniques such as Hancock, Morciano and Pudney (2013), Melnychuk, Solmi, and Morris (2018), and Solmi, Melnychuk and Morris (2018).

A non-parametric matching method was chosen in this Report in order to obtain more robust estimates. Following Hancock, Morciano and Pudney (2013), Melnychuk, Solmi and Morris (2018), and Solmi, Melnychuk, and Morris (2018), the cost of disability is estimated by calculating the difference between the 'actual' income of households having a member with disability and an expected income. The 'expected' income is the income of counterfactual households that have the same characteristics but none of their family members have disability. This approach is the standard economic method known as Compensating Variation (CV) in income i.e. how much extra income do households with a family member need to be compensated to cover the cost burden of disability.

The underlying assumption of the SoL method is, with the same income level, people with disability may experience a lower SoL than their counterparts without disability (see Figure 6 in the main body of the Report). Because households with members with disability have to allocate their resources, which are often very limited, in ways to try to overcome the structural barriers they face, they have less opportunity to allocate these to goods and services that increase their SoL. In this context, the term 'standard of living' is used to indicate material well-being rather than general utility. Therefore, the SoL approach estimates the extra living costs imposed on households rather than reflecting a loss in subjective well-being as a direct result of any impairment (Zaidi and Burchardt, 2005). This approach does not, however, include opportunity costs (e.g. lost opportunities that might arise from the loss of personal earnings or income foregone by family members, relatives or friends when they provide unpaid care to a person with disability rather than working), which may be large and significant.

Figure 6 in the main body of the Report demonstrates the theoretical relationship between SoL and income for a household with a family member with a given level of disability (D_1) and an otherwise identical household but with no person with disability (D_0). SoL is assumed to increase with the income for all households. However, for households with a member with disability the same income is associated with a lower SoL (e.g. point A is higher than point C at the income level Y_1). Thus, to reach the same SoL (S_2), the household with a member with disability needs to have a higher income. As shown in Figure 6, the household with a family member with disability needs to have income at point B to achieve a SoL level of S_2. The 'compensation' is equal to an extra income of Y_2- Y_1. The CV approach then implies Y_2- Y_1 is the cost of disability to the impacted household.

APPENDIX B – COST OF DISABILITY

Table B1. Cost of disability (Compensating Variation) among households with at least one adult member with disability, 2015-16 ($ per week)

Type of Household	All HHs	Single HHs	Couple HHs
Baseline			
HHs with at least one member with disability	107***	46***	152***
	[63, 151]	[20, 72]	[78, 226]
Of whom			
- have profound/severe disability	173***	60***	233***
	[85, 260]	[8, 112]	[102, 364]
- have mild/moderate disability	87***	41***	122***
	[35, 140]	[11, 71]	[33, 212]
HHs with members with disability receiving DSP	183***	93***	277***
	[84, 283]	[40, 145]	[83, 471]
HHs with members with disability receiving NSA	343***	176***	489***
	[248, 439]	[81, 270]	[334, 643]
HHs with members with disability receiving AP	122***	39***	187***
	[67, 177]	[12, 66]	[91, 283]
Excluding direct healthcare costs			
HHs with at least one member with disability	119***	49***	170***
	[75, 163]	[23, 75]	[96, 245]
Of whom			
- have profound/severe disability	180***	60**	243***
	[92, 267]	[5, 114]	[113, 374]
- have mild/moderate disability	103***	47***	146***
	[51, 156]	[17, 76]	[56, 236]
HHs with members with disability receiving DSP	180***	85***	277***
	[81, 279]	[32, 138]	[84, 470]
HHs with members with disability receiving NSA	344***	177***	489***
	[248, 440]	[85, 269]	[332, 646]
HHs with members with disability receiving AP	128***	39***	197***
	[70, 185]	[12, 66]	[97, 297]

Source: Authors' calculations from the 2015–16 HES. DSP= Disability Support Pension. AP=Age Pension.

Notes:

1. The expected HH disposable income in cases where households do not have any members with disability is estimated using the NNM approach. From these estimations, the CV or the difference between the expected income and the reported one among households with members with disability is calculated.
2. A null hypothesis that these CVs are less than or equal to zero is tested. These hypotheses can be rejected at *p≤0.10,**p≤0.05,***p≤0.01. Numbers in brackets reflect the 95% confidence interval of CV.
3. 'Baseline' refers to CV estimation from HH disposable income while 'Excluding healthcare costs' means CV estimation from HH disposable income excluding direct healthcare costs.

APPENDIX C - SENSITIVITY CHECKS

We applied a number of sensitivity checks in this Report. First, regarding the construction of the SoL Index, we apply another weighting method, following Melnychuk, Solmi, and Morris (2018), Solmi, Melnychuk, and Morris (2018), where weights reflect the relative necessity of owning an item within the sample. We also use an alternative measurement of SoL using a restricted subset of the one used as the baseline. Second, in terms of matching techniques, we use alternative matching methods: NNM with a matching ratio of 3:1 and Propensity Score Matching (PSM). Rather than using the distance between covariate patterns to find a match like NNM, PSM uses a score which is a predicted probability that a family has a member with disability from a probit/logit model, given their observed characteristics.

However, as suggested by Berthoud, Lakey, and McKay (1993), McKay (2004) that some parts of the population with lowered expectation, such as older people with disability, can be less likely than others to admit to being unable to afford particular items or activity. Therefore, following Morciano, Hancock, and Pudney (2015), we later carry out a sensitivity test on the restricted subset where each indicator is assigned to 1 if the respondents answer that they did not do an activity.

Table C1. Sensitivity Check - Estimated Cost of Disability among households with at least one adult member with disability, 2015-16 ($ per week)

Type	Disability	DSP Recipient	NSA Recipient	AP Recipient
Matching ratio of 1:1				
- Baseline	107***	183***	343***	122***
	[63, 151]	[84, 283]	[248, 439]	[67, 177]
- Alternative weighting method of SoL	109***	173***	278***	139***
	[64, 153]	[72, 274]	[188, 368]	[85, 193]
- Restricted sets of SoL	87***	148***	305***	136***
	[49, 124]	[69, 227]	[216, 394]	[88, 184]
- Propensity Score Matching	97***	100***	367***	147***
	[51, 142]	[19, 182]	[232, 502]	[101, 194]
Matching ratio of 1:3				
- Baseline	108***	157***	315***	146***
	[76, 139]	[92, 222]	[244, 385]	[110, 181]
- Alternative weighting method of SoL	114***	168***	298***	150***
	[82, 145]	[103, 233]	[231, 364]	[114, 185]
- Restricted sets of SoL	80***	157***	311***	122***
	[51, 109]	[97, 216]	[247, 375]	[92, 152]
- Propensity Score Matching	96***	126***	362***	184***
	[58, 134]	[52, 199]	[264, 461	[140, 228]

Source: Authors' calculations from the 2015-16 HES.

Notes: The tests on the null hypothesis that these CVs are less than or equal to zero are implemented. These hythotheses can be rejected at *p≤0.10,**p≤0.05,***p≤0.01. Propensity score matching approach is applied with the caliper of 0.1 while NNM approach is used in other cases with the caliper of 0.00001 and exact matches for SoL index groups and marital status (single or couple). Lower and upper bounds of CV are reported in brackets

APPENDIX D - STINMOD+ SIMULATION POLICY COVERAGE

STINMOD+ model covers three components of the Australian tax and transfer system: the family related benefits, pensions and allowances, and the taxation system. The following transfer programs are included in STINMOD+

- ABSTUDY
- Age Pension
- Austudy
- Bereavement Allowance
- Carer Allowance
- Carer Payment
- Carer Supplement
- Child Care benefit and Child Care Rebate
- Childcare Subsidy
- Dad and Partner Pay
- DVA Pension
- Disability Support Pension
- Energy Supplement
- Family Tax Benefit A and related benefits
- Family Tax Benefit B and related benefits
- Farm Household Allowance
- Newstart Allowance (incl. participation supplement)
- Parental Leave Pay
- Parenting Payment (single and partnered)
- Partner Allowance
- Pensioner Education Supplement
- Remote Area Allowance
- Sickness Allowance
- Special Benefit
- Widow Allowance
- Widow B Pension
- Wife Pension
- Youth Allowance
- and others.

The following taxation rules are included in STINMOD+

- Income tax
- Medicare Levy and Medicare Levy Surcharge
- Temporary Levy such as flood levy and budget repair levy
- Tax Offsets such as low-income tax offset, middle- and low-income tax offset, beneficiary tax offset, seniors and pensioners tax offset
- Private health insurance rebate
- Education tax refund
- Superannuation concessional contribution tax
- Superannuation excess concessional contribution charge
- Very high income contribution tax (Division 293 tax)
- Government super co-contribution
- Low income superannuation tax offset

APPENDIX E - SA2 SPATIAL IMPACTS OF THE POLICY OPTIONS

Due to the size of the table, the results are included as an Excel attachment.

Australian Federation of
Disability Organisations

UNIVERSITY OF CANBERRA

INSTITUTE FOR GOVERNANCE & POLICY ANALYSIS

NATSEM
at the University of Canberra