

# The impact of the disability support pension on mental health: evidence from 14 years of an Australian cohort

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At a population level, persons with disabilities have worse mental health than those without disabilities.<sup>1</sup> Socioeconomic circumstances have been found to explain some of these inequalities in mental health.<sup>1,3</sup> Contextual factors relating to access to government welfare or benefits may also contribute to the poorer mental health among some people with disabilities.<sup>4,5</sup> Evidence from the United Kingdom (UK) suggests that changes in the eligibility for the disability pension were associated with population-level increases in suicide, self-reported mental health problems and antidepressant use.<sup>4</sup>

## Why is a disability pension associated with poorer mental health?

Many potential reasons could explain why a disability pension may be associated with poorer mental health among people with disabilities. One of these concerns is the perceived stigma around accessing support<sup>5,6</sup> and the negative psychological consequence of that stigma. Baumberg<sup>5</sup> argues that 'claims stigma' is comprised of several elements that may be damaging to people's mental health including lack of privacy (e.g. means testing), long waiting times to obtain support and the surveillance culture. It is also possible that there are other explanations for poorer mental health among those who receive DSP, including worsening health conditions.<sup>7</sup> Also, similar to other income support payments, poor mental health among disability pension

## Abstract

**Objective:** To assess the effect of the Australian Disability Support Pension (DSP) on the symptomatology of depression and anxiety over and above the effects of reporting a disability itself.

**Methods:** We used the Household Income Labour Dynamics in Australia (HILDA) survey from 2004 to 2017. We used fixed effects regression to understand mental health differences (using the Mental Health Inventory-5 [MHI-5]) when a person reported: i) a disability; or ii) a disability and receiving the DSP) compared to when they reported no disability. The models controlled for time-varying changes in the severity of the disability and other time-related confounders.

**Results:** There was a 2.97-point decline (95%CI -3.26 to -2.68) in the MHI-5 when a person reported a disability compared to waves in which they reported no disability and 4.48-point decline (95%CI -5.75 to -3.22) when a person reported both a disability and being on the DSP compared to waves in which they reported neither.

**Conclusions:** Results suggest that accessing and being in receipt of the DSP can impact the mental health of people with disabilities.

**Implications for public health:** Government income support policies should address the unintended adverse consequences in already vulnerable populations.

**Key words:** disability pension, disability support, mental health, cohort, fixed effects regression

recipients could be a result of financial hardship given the low levels of payment.<sup>8</sup> Other participant demographics could also play a role. For instance, Rahman et al.<sup>9</sup> found that gender and age played a role in an increased risk of suicidal behaviour among Swedish disability pension recipients. However, there is a significant gap in the literature<sup>10</sup> and further exploration of the relationship between the DSP and mental health, including increasing severity of illnesses or injuries, is needed. Our paper aims to address this gap.

## The Australian Disability Support Pension

In this paper, we focus on the Australian Disability Support Pension (DSP). In 2016–17, approximately 760,000 persons received the DSP.<sup>11</sup> The DSP provides financial support to Australian citizens (and some residents) who are unable to work as a result of their disability. Musculoskeletal, psychological and intellectual conditions comprised 60% of new DSP recipients in 2016–17.<sup>11</sup> Like in many other countries of the world, spending on the DSP is a significant cost for the government.<sup>12</sup>

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In 2016–17, Australia spent \$16.8 billion on the DSP, making it one of the most expensive government programs in the country.<sup>11</sup>

In this article, we examine the effects of being in receipt of the DSP on mental health over and above the presence of a disability itself. We also assess the relative effects of the DSP while considering the possibility that worsening disability severity is related to changes in mental health. We investigate this area using a panel dataset of more than 9,000 Australians and a within-person analytic approach, enabling us to assess the role of both disability and receipt of DSP on mental health while controlling for stable within-person characteristics, as well as those factors that vary over time. The current study extends previous research, most of which has focused on mental health symptomology as being a predictor of DSP<sup>10–12</sup> rather than recognising the potential mental health impacts of receipt of the DSP. For example, Mykletun et al.<sup>13</sup> found that anxiety and depression, particularly when co-existing, were strong predictors of disability pension in Norway. In their study,<sup>13</sup> approximately one-quarter of accepted disability pension recipients had a psychiatric disorder. However, it is unclear how this figure changed during the assessment process or while in receipt of the benefit. Ahola et al.<sup>14</sup> found similar results in a Finnish sample, but the sub-sample of those granted disability pension was relatively small (n=208). Previous literature<sup>e.g.13–15</sup> focused on those with mental illness applying for disability pension, failing to measure how mental health changes during the application process or post-receipt of disability pension. While mental illness as a predictor of or reason for disability pension is important and policy relevant, more research is needed on the mental health changes associated with receipt of disability pension. Our key research question is to what extent is receipt of a DSP associated with changes in mental health, after also considering the independent effect of changes in core functioning?

## Methods

### Data

The Household, Income and Labour Dynamics in Australia (HILDA) survey is a longitudinal, nationally representative study of households established in 2001. It collects detailed information annually from more than 13,000 individuals in over 7,000 households.<sup>16</sup> The

initial wave of the survey began with a large national probability sample of households occupying private dwellings.<sup>16</sup> The survey covers a range of dimensions including social, demographic, health and economic conditions using a combination of face-to-face interviews with trained interviewers and a self-completion questionnaire. The response rate for Wave 1 was 66%.<sup>16</sup> Interviews were sought in later waves with all persons in sample households who turned 15 years of age. Additional persons have been added to the sample as a result of changes in household composition. Inclusion of these new households is the primary way the HILDA survey maintains sample representativeness. A top-up sample of 2,000 people was added to the cohort in 2011 to allow better representation of the Australian population using the same methodology as the original sample (i.e. a three-stage area-based design).<sup>17</sup> The response rates for the HILDA survey are above 90% for respondents who have continued in the survey and above 70% for new respondents being invited into the study.<sup>16</sup> The present study uses 14 waves of data (2004 to 2017). The sample (described further below) consists of people aged 18 to 64 years with ‘time-varying’ intermittent disability, in that they reported disability in some waves and not in others.

### Outcome

Mental health was assessed using the five-item Mental Health Inventory (MHI-5), a subscale from the Short Form-36 (SF-36) general health measure. The MHI-5 assesses symptoms of depression and anxiety (nervousness, depressed affect) and positive aspects of mental health (feeling calm, happy) in the past four weeks. The MHI-5 has reasonable validity and is an effective screening instrument for mood disorders or severe depressive symptomatology in the general population<sup>18–20</sup> and has been validated as a measure for depression using clinical interviews as the gold standard.<sup>21,22,18</sup> The current analyses use the continuous MHI-5 score (scale 1 to 100), with higher scores representing better mental health. Although there is no universally accepted translation of MHI-5 score difference to clinical meaningfulness, a difference of three points on the norm-based scale (T-score) has been suggested to reflect a minimally important difference.<sup>23</sup>

### Exposure

We created a three-level variable that represented: i) when a person reported having a disability (but was not on the DSP); ii) when a person was on the DSP and also reported a disability. This was compared to the reference of reporting neither a disability or the DSP (0). The question about DSP was: “I am now going to ask you about your receipt of government pensions, benefits and allowances ... During the last financial year, did you receive any of these government pensions or allowances? ... Disability Support Pension (paid by Centrelink [Government Social Support Agency])?”. Disability was determined from the following survey question: “Do you have any long-term health condition, impairment or disability that restricts you in your everyday activities, and has lasted or is likely to last, for six months or more?” Specific examples of long-term conditions were shown, such as limited use of fingers or arms, long-term psychological problems, or problems with eyesight that could not be corrected with glasses or contact lenses.

### Confounders

We selected age group, education, household structure, weekly household income, employment status and area of residence as possible confounders, based on previous literature. Table 1 shows the categories within each confounder. We also controlled for severity of disability through a three-level variable representing whether a person reported restrictions to either core activities (communication, personal care or mobility, e.g. performing tasks like bathing) or school or employment restrictions. This information was collected in 2004, 2009, 2013 and 2017. We carried forward a person’s observed response to this question in 2004 to the year 2008, while their response in 2009 was carried forward to 2012, and the 2013 response was carried forward to 2016. In recognition of the fact that eligibility for the DSP has changed over time<sup>11</sup> (and also may have an independent effect on mental health), we also included year as a time-varying confounder, analysed continuously.

### Analysis

We first used descriptive analysis to examine the proportion of people who reported a disability who were also on a DSP within the group of people who reported a disability in some waves and not others (‘intermittent

disability'). We then assessed mean difference in the MHI-5 by the main exposure, which was an indicator variable for whether people reported a disability and being on the DSP (or not).

We then conducted a fixed effects linear regression on the relationship between DSP and mental health among those with intermittent disability. All persons had to have reported at least one wave without disability and at least one wave with disability to be considered eligible for the study. We controlled for severity of disability, and the time-varying confounders described above. Fixed effects models are able to demonstrate within-person changes in mental health in relation to changes in disability and DSP. Hence, we are able to understand the difference in a given person's mental health when they reported a disability, or a DSP and disability compared to when they did not report either. Person-related factors – such as country of birth, gender and stable personality factors – are controlled for in fixed effects regression and were thus excluded from the models. We conducted a sensitivity analysis to assess whether the relationship between mental health and disability and DSP differed when we restricted to a low household income sample of people, who would be most likely to be eligible for the DSP if this was needed. We conducted a second sensitivity analysis assessing if the amount of the DSP received each fortnight influenced results. This analysis also controlled for employment status, recognising that receipt of DSP operates in conjunction with whether a person is working or not.

## Results

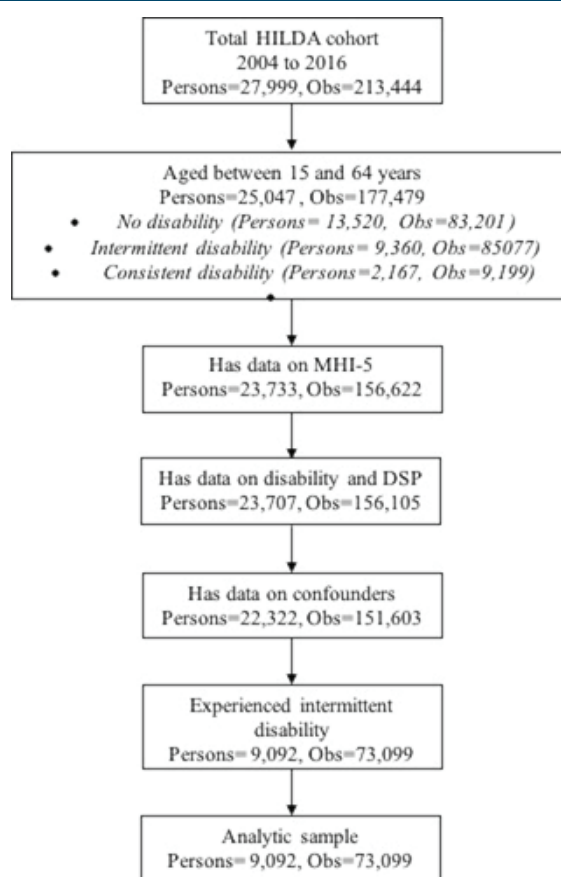
A description of the analytic sample can be seen in Figure 1. As can be seen, 9,092 people (73,099 observations) experienced intermittent disability (and were thus eligible for the study). This was less than 11% of missing data across the entire sample.

Table 2 shows a description of the MHI-5 by the indicator variable. When the data is pooled across all waves and all persons, there is a substantial difference of more than six points on the MHI-5 scale when a person reports a disability (but no DSP) compared to when they report no disability. There is more than a 14-point difference in the MHI-5 between persons who reported both a disability and being on DSP and those who reported neither. It is worth noting that most

**Table 1: Description of confounders.**

Age	Continuous
Education	Bachelor's degree or higher, Adv. Dip., Diploma, Certificate or Year 12, Year 11 or below
Household structure	Couple no children, Couple with children, Lone parent with children, Lone person, Other
Employment status	Employed, Unemployment, NILF (Not in the Labour Force)
Country of birth	Australia, Other English country, Other
Household income	Lowest, Low-medium, Medium, Medium-high, High
Area of residence	Metropolitan, Inner regional, Outer regional, Remote
Disability severity	No specific restriction, Core activity restriction, Has a schooling/employment restriction

**Figure 1: Description of analytic sample.**



people who are in receipt in DSP are much more likely to be Not in the Labour Force (80.8%) than being either employed (14.8%) or unemployed (4.4%).

Table 3 shows the fixed effects regression results. There was a 2.97 point decline (95%CI -3.26 to -2.68) in the MHI-5 when a person reported a disability compared to waves in which they reported no disability, and 4.48 point decline (95%CI -5.75 to -3.22) when a person reported both a disability and being on the DSP compared to waves in which they reported neither.

The sensitivity analysis conducted among those in the lowest income group shows similar results to the primary analysis,

although effect estimates are larger (Supplementary Table 1). Our second sensitivity analysis controlling for the amount of DSP given to a participant showed that this did not influence results (Supplementary Table 2). The mean amount given each fortnight was \$485.76 (standard deviation of \$169.33) for those within the analytic sample. This differed from \$497.40 (standard deviation of \$155.07) in the lowest income group to \$388.32 (standard deviation of \$166.04) in the highest income group. More than 76% of the sample were in the lowest or second-lowest income group; 3% of DSP recipients were in the highest household income group.

## Discussion

Our study highlights the detrimental role of both disability and the DSP on mental health. Compared to when a person did not report either having a disability or receiving the DSP, reporting a disability was associated with a substantial decline in mental health and the effect of being in receipt of a DSP and having a disability appears to be even greater than reporting a disability alone.

There are several potential explanations for the adverse influence of the DSP on mental health. First of all, it is possible that aspects involved in obtaining (and/or staying on) the DSP is damaging to mental health, including how claimants are treated by government staff and how claims eligibility are assessed.<sup>5</sup>

In the Australian context, numerous changes to the DSP eligibility criteria since its introduction in 1991 means the assessment process is continually changing.<sup>11,24</sup> We suggest that these structural and administrative aspects of obtaining the DSP may create psychosocial stress, resulting in declines to mental health, which aligns with the research of Barr et al.<sup>4</sup> in the UK on changes to the disability income support and worsening population-level mental health.

It is also possible that the 'claims stigma'<sup>5</sup> negatively impacts mental health. Recent qualitative research with 15 disability claimants in the UK found that participants perceived stigma from others (including being felt judged and treated unfairly for claiming benefits) and described the benefits

system as dehumanising. These experiences negatively affected participants' mental and physical health, wellbeing and self-identity. Even though many participants reported resisting these negative impacts (e.g. through seeking support or taking political action), these experiences led to shame, hopelessness and social isolation.<sup>25</sup> Another study in the UK<sup>26</sup> reported recipients of the disability income support increasingly felt that they experienced 'welfare surveillance'<sup>27</sup> by government agencies, as well as by their communities, which was perhaps driven by official and media discourses around benefit claiming. These findings add to results of a nationally representative survey targeting attitudes to benefits, which found that 34% of participants who had accessed benefits reported either personal stigma (their view) or stigmatisation (perceived stigma by others).<sup>5</sup> We would argue that the potentially damaging effect of stigma is a potential explanation of our results, given the qualitative evidence presented above. However, more empirical evidence is needed on this topic.

Potential non-psychosocial explanations for the results of this study include the possibility that worsening health conditions drive poorer mental health. We accounted for this possibility by controlling for core activity and educational/employment limiting restrictions related to a person's disability in our analysis. Results suggest that the effect of the DSP operated over and above the potential for worsening health conditions; however, the potential residual confounding remains due to mismeasurement of disability severity, which was only measured at three time points in the survey. Health behaviour changes – such as increased use of alcohol or drugs – could also explain the results of this study. Some evidence suggests that the incidence of drug and alcohol use is much higher among welfare recipients than non-welfare recipients.<sup>7,28</sup> However, we did not adjust for these in the present study due to the possibility that alcohol and drug use may be mediators of the relationship between DSP and mental health. For example, obtaining DSP drives a person to use alcohol and/or drugs, which then results in depressive and anxiety symptoms.<sup>29</sup>

### Limitations

The limitations of this paper include the nature of self-reported exposure and outcome data, which could lead to

**Table 2: Description of MHI-5 by presence of a disability and Disability Support Pension (DSP), and description of confounders among those with an intermittent disability and who were included in the analytic sample, HILDA, 2004 to 2017.**

	Mean MHI-5	Std. Dev.
No DSP, no disability	73.80	16.59
No DSP, Disability	67.49	19.61
On DSP, Disability	59.35	22.54
	Obs	%
<b>Education</b>		
Bachelor's degree or higher	17,522	23.97
Adv. Dip., Diploma, Certificate or Year 12	35,096	48.01
Year 11 or below	20,481	28.02
<b>Household structure</b>		
Couple no children	19,494	26.67
Couple with children	32,945	45.07
Lone parent with children	7,462	10.21
Lone person	10,014	13.7
Other	3,184	4.36
<b>Employment status</b>		
Employed	53,621	73.35
Unemployed	3,365	4.6
Not in the labour force	16,113	22.04
<b>Country of birth</b>		
Australia	59,297	81.14
Other English country	6,679	9.14
Other	7,105	9.72
<b>Household income</b>		
Lowest	10,055	13.76
Low-medium	12,548	17.17
Medium	15,440	21.12
Medium-high	17,425	23.84
High	17,631	24.12
<b>Area of residence</b>		
Metropolitan	47,648	65.18
Inner regional	16,677	22.81
Outer regional, remote	8,774	12
<b>Disability severity</b>		
No specific restriction	64,882	88.76
Core activity restriction	4,149	5.68
Has a schooling/employment restriction	4,068	5.57



dependent misclassification. Another limitation is that the reporting of DSP refers to the previous financial year, while disability and the MHI-5 refer to the previous four weeks. This introduces the potential for a misalignment in the temporality of exposure and outcome. For example, Wave 17 interviews were conducted between July 2017 and February 2018. If someone was interviewed in July 2017, the question on the DSP would refer to the financial year 2016/17, while the question would also refer to the financial year 2016/17 for someone interviewed in February 2018. It is also important to note that the amount people receive is means tested. Our results suggest that people in the lowest household income group were allocated the greatest amount of the DSP per fortnight. It is worth noting that the DSP continued to have an effect on mental health over and above the amount awarded. Other limitations include the generalisability in the sample, due to drop out from the sample, and possible selection bias (although only about 11% had missing information). It is also important to highlight the fact that HILDA under-represents people with severe disabilities (about 2% were included in the analytic dataset) compared to the general population (about 5.8% in 2015<sup>30</sup>). It is also important to acknowledge that the information on core activity limitation was not collected at each wave. Hence, we assumed that there was some stability in impairment severity over time. Finally, our study quantifies the association between mental health, the DSP and a disability, but there are limitations that need to be considered for these results to have a causal interpretation. Although fixed effects analysis accounts for factors that are time-invariant within an individual such as a history of mental illness, we cannot completely determine the direction of the causal relationship because DSP receipt and mental health were measured contemporaneously. Therefore, we cannot exclude the possibility of reverse causation, whereby the observed association is explained by poor mental health leading to DSP receipt, in line with the results from previous research.<sup>13-15</sup> The question in the HILDA Survey relating to DSP referred to the previous financial year, therefore temporally preceded people's mental health report.

Future research could focus on which specific aspects of the DSP may be causing the most harm to a recipient's mental health. Some potential explanations

**Table 3: Fully adjusted fixed effects regression\*, relationship between the indicator variable (no disability, disability only, disability and DSP) and the MHI-5, among those with an intermittent disability, HILDA, 2004 to 2017.**

	Coef	95%CI	p-value
<b>Disability + DSP pension</b>			
No disability	0		
Disability	-2.97	-3.26--2.68	<0.001
Disability + DSP	-4.48	-5.75--3.22	<0.001
<b>Education</b>			
Not completed year 12	0		
University degree	-1.96	-3.32--0.60	0.005
Year 12 & Cert	-1.06	-1.86--0.25	0.010
<b>Age</b>	-0.03	-0.07--0.01	0.129
<b>Household structure</b>			
Couple no kids	0		
Couple with kids	-0.69	-1.14--0.24	0.003
Lone parent kids	-2.29	-3.09--1.49	<0.001
Lone person	-2.24	-2.93--1.55	<0.001
Multi-person	-1.56	-2.33--0.78	<0.001
<b>Employment status</b>			
Employed	0		
Unemployed	-1.84	-2.47--1.20	<0.001
Not in the labour force	-1.80	-2.27--1.33	<0.001
<b>Income</b>			
Lowest	0		
Low-med	0.24	-0.23--0.72	0.311
Medium	0.17	-0.34--0.69	0.508
Med-high	0.70	0.16--1.23	0.011
Highest	0.73	0.15--1.31	0.014
<b>Area of residence</b>			
Major Cities	0		
Inner Regional	0.09	-0.73--0.92	0.827
Outer regional, remote	0.58	-0.54--1.70	0.312
<b>Disability severity</b>			
No specific restriction	0		
Core activity restriction	-1.95	-2.81--1.09	<0.001
Has a schooling/employment restriction	-1.51	-2.31--0.71	<0.001
Constant	75.76	74.01--77.50	<0.001

Notes:

Models include 9,092 ppl, 73,099 obs; Coef= Coefficient; 95%CI= Upper and lower confidence intervals at 95% significance, p value= statistical significance at 95%. Year omitted due to collinearity.

\*All models include the variables listed in the table

(e.g. stigma, procedural aspects related to delays in obtaining the DSP) should be considered. Further, we need more research on the possibility of a mutually reinforcing relationship between DSP and mental health symptomology, especially considering the evidence showing mental health symptomology as being a predictor of DSP.<sup>13-15</sup> We would also highlight the importance of assessing whether the background characteristics of applicants and changes to eligibility influence the mental health consequences of the DSP. For example, there have been recent increases in female applicants to the DSP, which may be driven by changes in the age pension scheme for

women (from 60 to 66 years of age) in recent years. The approach taken in this paper was to hold these person-related factors stable, so we were able to assess the possible causal effect of a difference in DSP status with differences in mental health.

## Conclusion

In conclusion, this research suggests that the DSP is harmful to mental health independent of the effect of disability, which is possible due to aspects such as stigma or psychosocial stressors involved in obtaining and maintaining the award. Results suggest the need for more considerable policy attention

into the unintended adverse consequences of accessing governmental support in already vulnerable populations.

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## Author access to data

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## References

- Aitken Z, Simpson JA, Gurrin L, Bentley R, Kavanagh AM. Do material, psychosocial and behavioural factors mediate the relationship between disability acquisition and mental health? A sequential causal mediation analysis. *Int J Epidemiol*. 2018;47(3):829-40.
- Kavanagh AM, Aitken Z, Baker E, LaMontagne AD, Milner A, Bentley R. Housing tenure and affordability and mental health following disability acquisition in adulthood. *Soc Sci Med*. 2016;151:225-32.
- Kavanagh AM, Aitken Z, Krnjacki L, LaMontagne AD, Bentley R, Milner A. Mental health following acquisition of disability in adulthood—The impact of wealth. *PLoS One*. 2015;10(10):e0139708.
- Barr B, Taylor-Robinson D, Stuckler D, Loopstra R, Reeves A, Whitehead M. 'First, do no harm': are disability assessments associated with adverse trends in mental health? A longitudinal ecological study. *J Epidemiol Community Health*. 2016;70(4):339-45.
- Baumberg B. The stigma of claiming benefits: A quantitative study. *J Soc Policy*. 2016;45(2):181-99.
- Hatzenbuehler ML, Link BG. Introduction to the special issue on structural stigma and health. *Soc Sci Med*. 2014;103:1-6.
- Montoya ID, Brown V. Welfare Shame, Economic Hardship, and Drug Use: Their Relationship to the Psychological Distress Observed in TANF Recipients. *J Am Psychiatr Nurses Assoc*. 2007;3(5):275-84.
- Butterworth P, Crosier T, Rodgers B. Mental health problems, disability and income support receipt: A replication and extension using the HILDA survey. *Aust J Labour Econ*. 2004;7(2):151.
- Rahman SG, Alexanderson K, Jokinen J, Mittendorfer-Rutz E. Disability pension due to common mental disorders and subsequent suicidal behaviour: A population-based prospective cohort study. *BMJ Open*. 2016;6(4):e010152.
- Øverland S, Glozier N, Henderson M, Maeland JG, Hotopf M, Mykletun A. Health status before, during and after disability pension award: The Hordaland Health Study (HUSK). *Occup Environ Med*. 2008;65(11):769-73.
- Parliamentary Budget Office. *Disability Support Pension: Historical and Projected Trends*. Report No.: 01/2018. Canberra (AUST): Australian Parliamentary Budget Office; 2018.
- McVicar D, Wilkins R, Ziebarth NR. Disability benefit growth and disability reform in the US: Lessons from other OECD nations. *IZA J Labor Policy*. 2014;3. 10.1186/2193-9004-3-4.
- Mykletun A, Overland S, Dahl AA, Krokstad S, Bjerkeset O, Glozier N, et al. A population-based cohort study of the effect of common mental disorders on disability pension awards. *Am J Psychiatry*. 2006;163(8):1412-18.
- Ahola K, Virtanen M, Honkonen T, Isometsä E, Aromaa A, Lönnqvist J. Common mental disorders and subsequent work disability: A population-based Health 2000 Study. *J Affect Disord*. 2011;134(1):365-72.
- Knudsen AK, Øverland S, Aakvaag HF, Harvey SB, Hotopf M, Mykletun A. Common mental disorders and disability pension award: Seven year follow-up of the HUSK study. *J Psychosom Res*. 2010;69(1):59-67.
- Wilkins R. Families, Incomes and Jobs, Volume 8. A Statistical Report on Waves 1 to 10 of the Household, Income and Labour Dynamics in Australia Survey. In: *HILDA Statistical Report*. Melbourne (AUST): Melbourne Institute of Applied Economic and Social Research Faculty of Business and Economics; 2013.
- Watson N. *Methodology for the HILDA Top-up Sample*. Hilda Project Technical Paper Series No.: 1/11. Melbourne (AUST): Melbourne Institute of Applied Economic and Social Research Faculty of Business and Economics; 2011.
- Rumpf HJ, Meyer C, Hapke U, John U. Screening for mental health: Validity of the MHI-5 using DSM-IV Axis I psychiatric disorders as gold standard. *Psychiatry Res*. 2001;105(3):243-53.
- Yamazaki S, Fukuhara S, Green J. Usefulness of five-item and three-item Mental Health Inventories to screen for depressive symptoms in the general population of Japan. *Health Qual Life Outcomes*. 2005;3:48.
- Gill SC, Butterworth P, Rodgers B, Anstey KJ, Villamil E, Melzer D. Mental health and the timing of men's retirement. *Soc Psychiatry Psychiatr Epidemiol*. 2006;41(7):515-22.
- Berwick DM, Murphy JM, Goldman PA, Ware JE Jr, Barsky AJ, Weinstein MC. Performance of a five-item mental health screening test. *Med Care*. 1991;29(2):169-76.
- Cuijpers P, Smits N, Donker T, ten Have M, de Graaf R. Screening for mood and anxiety disorders with the five-item, the three-item, and the two-item Mental Health Inventory. *Psychiatry Res*. 2009;168(3):250-5.
- Ware JE Jr. SF-36 health survey update. *Spine*. 2000;25(24):3130-9.
- National Social Security Rights Network. *Disability Support Pension (DSP) Project: A Snapshot of DSP Client Experiences of Claims and Assessments Since the 2015 Changes*. Sydney (AUST): National Social Security Rights Network; 2018.
- Saffer J, Nolte L, Duffy S. Living on a knife edge: The responses of people with physical health conditions to changes in disability benefits. *Disabil Soc*. 2018;33(10):1555-78.
- Manji K. Social security reform and the surveillance state: Exploring the operation of 'hidden conditionality' in the reform of disability benefits since 2010. *Soc Policy Soc*. 2017;16(2):305-14.
- Henman P, Marston G. The social division of welfare surveillance. *J Soc Policy*. 2008;37(2):187-205.
- Pollack HA, Reuter P. Welfare receipt and substance-abuse treatment among low-income mothers: The impact of welfare reform. *Am J Public Health Res*. 2006;96(11):2024-31.
- Boden JM, Fergusson DM. Alcohol and depression. *Addiction*. 2011;106(5):906-14.
- Australia Bureau of Statistics. *4430.0 - Disability, Ageing and Carers, Australia: Summary of Findings, 2015*. Canberra (AUST): ABS; 2016.

## Supporting Information

Additional supporting information may be found in the online version of this article:

**Supplementary Table 1:** Fixed effects regression among those in lowest income group (up to \$522.83 a week), relationship between the indicator variable (no disability, disability only, disability and DSP) and the MHI-5, among those with an intermittent disability, HILDA, 2004 to 2017.

**Supplementary Table 2:** Fixed effects regression, relationship between the indicator variable (no disability, disability only, disability and DSP) and the MHI-5, among those with an intermittent disability, HILDA, 2004 to 2016, also controlling for the amount of DSP awarded.