Effects of Informal Caring on Labour Market Outcomes of Carers: Evidence from HILDA

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Motivation

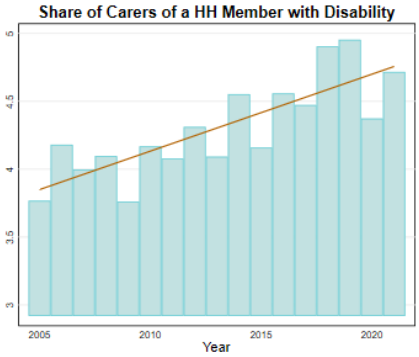
Research Question

- The employment rate is lower among people who have a carer duty (54 % vs. 67 % in 2021).
- The probability of not being in the labour force is higher among people who have a carer duty (44 % vs. 18 %).
- Although employment can affect taking a caring duty, caring may affect the probability of employment.
- There may be unobserved factors that affect both caring and employment outcomes such as cultural factors, stress tolerance, resilience, strong organizational skills, etc.
- **What is the causal effect of caring on labour market outcomes of carers?**
- Use **serious injury/illness to a family member in the past year** as an instrument.

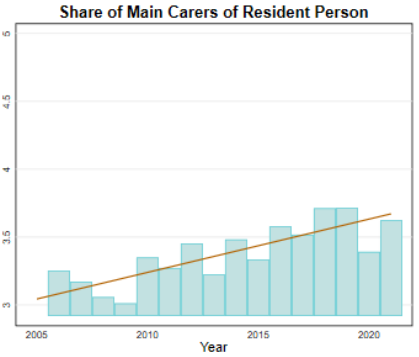
Motivation

- The population of Australians aged 65 and over has grown substantially
  - It increased from 1.0 million (8.3 % of the population) in 1970 to 4.2 million (16 % of the population) by June 2020
  - It is projected to reach between 21% and 23% by 2066.
- More than 4.4 million people in Australia have some form of disability.
  - 1.9 million of these people are 65 years and older, representing almost half (44.5%) of all people with disability.

Motivation



Sources: e61; HILDA Survey Release 21.0



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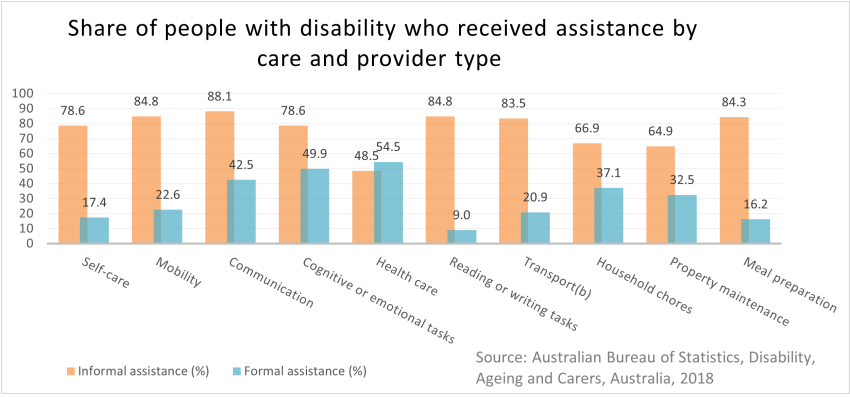
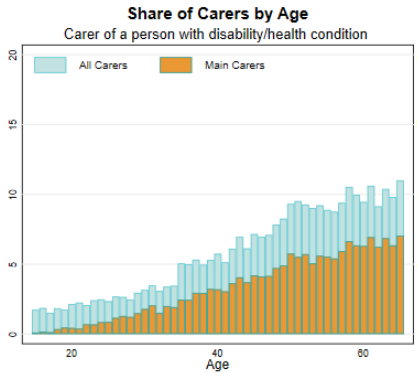
Motivation


Share of people with disability who received assistance by care and provider type
100
90
80
70
60
50
40
30
20
10
0
78.6
17.4
84.8
22.6
88.1
42.5
78.6
49.9
48.5
54.5
84.8
9.0
83.5
20.9
66.9
37.1
64.9
32.5
84.3
16.2
Self-care
Mobility
Communication
Cognitive or emotional tasks
Health care
Reading or writing tasks
Transport(b)
Household chores
Property maintenance
Meal preparation
Informal assistance (%)
Formal assistance (%)
Source: Australian Bureau of Statistics, Disability, Ageing and Carers, Australia, 2018

Motivation

- Approximately 1 in 10 working-age Australians provide unpaid care to people with disabilities, long-term health problems or age-related problems (Census, 2021)



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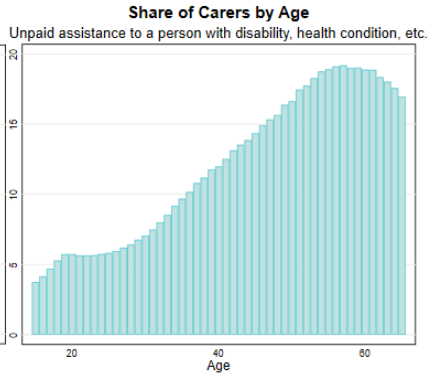


Sources: e61; Census 2021

Literature

Literature

International literature investigating the relationship between caring and labour supply decision

- Mostly identify association: Gomez et al. (2017), Schmitz and Westpal (2017), Ciccarelli and Van Soest (2018), etc.
- Only a few attempt to identify causal relationship: Heitmueller (2007), Ciani and Ciani (2012), Meng (2013), Van Houtven et al. (2013)
- Unexpected negative health shocks of a parent or household members: Rellstab et al. (2020), Wang (2021), Jeon and Pohl (2017)

Literature using Australian data is limited:

- Leigh (2010): HILDA 2001-2007, OLS-FE, caregiving ↓ employment rate 5-6 ppt, no effect on wages!
- Nguyn and Connelly (2014): exogenous caregiving, ↓ the probability of employment by approximately 12 ppt for both men and women.

Data

Data

- Household, Income and Labour Dynamics in Australia Survey (HILDA), a panel dataset covering 2001 to 2021.
- HILDA includes information on:
  - Labour market outcomes and health outcomes: Employment, being out of labour force, hours of work, income, self-reported health outcome, mental health outcomes, etc.

Data

- HILDA includes information on:
  - Caring duties:
    - **Actively cares for household member due to long-term health condition, elderly, disability.**
    - **Main carer of a resident person(s)**
    - **Hours of care per week spent caring for a disabled spouse / relative.**
  - HILDA also includes information on major life events such as serious injury/illness to a family member, death of spouse or child, etc.
  - We restricted the sample to respondents aged between 25 and 64 years, excluding those who are most likely to be completing education or entering retirement.
  - Use **2005-2021 data cycles**

Methodology

Methodology

- Individuals have time and budget constraint: Care duties may prevent individuals from joining the labour market, or those who are out of labour force or have poor labour market prospects may take care duties, or those who have financial stability/good labour market outcomes may take care duties.
- Therefore, being a caregiver is endogenous!
- Use **serious injury/illness to a family member** in the last year as an instrument for being a carer for a person with disability.
- We identify the **Local Average Treatment Effect (LATE)**: the effect on those who become caregivers after the serious injury/illness of a family member (compliers)!

Methodology

- We use the following model to estimate the effect of being carer:

$$Y_{it} = \gamma_i + \lambda_t + \beta CR_{it} + X'_{it}\theta + \epsilon_{it}$$

  - First stage

$$CR_{it} = \alpha_i + \xi_t + \eta Injury_{it} + X'_{it}\pi + u_{it}$$

where

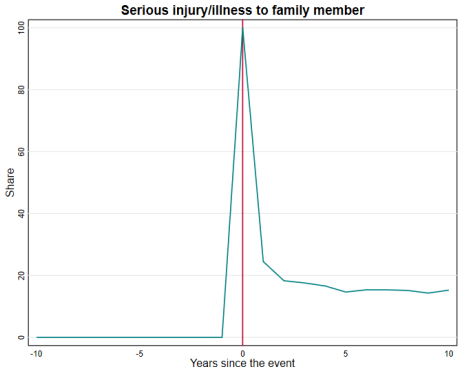
- Y_{it} is the outcome of individual i at time t such as employment, not being in labour force, real wages, hours of work.
- γ_i are individual fixed-effects
- λ_t are time fixed-effects
- CR_{it} is a dummy showing whether individual i is a care giver of a resident person in year t. Or hours spent caring for a disabled spouse / relative.

Methodology

- X_{it} are the time varying characteristics of individual i year t which includes:
  - Age squared, education level dummies
  - Number of adults in the household, family type fixed effects, number of kids aged 0-4, 5 to 9 and 10 to 14
  - Regional unemployment rate, region fixed-effects
  - Real household labour income except the person himself
  - Self-reported health status, mental health score
  - Dummies for major life events in the past year such as self injury, death of a close relative, death of a spouse or child, dead of a close friend.

Evidence from Raw Data

Data Patterns: Relevance



Evidence from Raw Data

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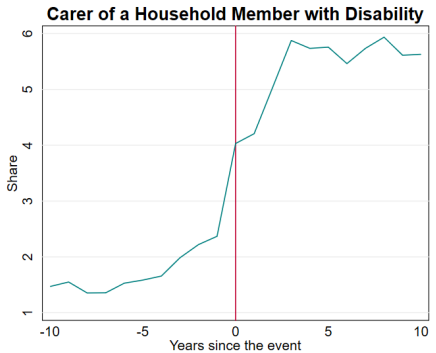

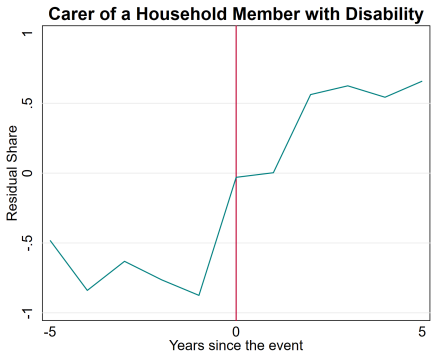

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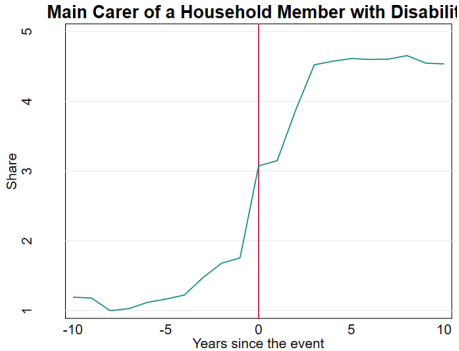

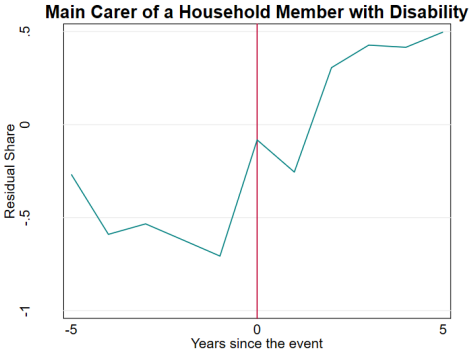

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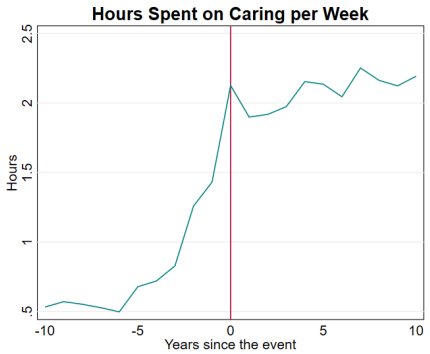
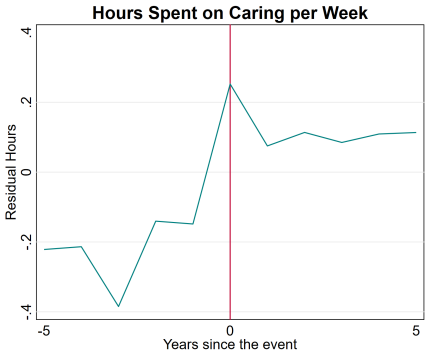
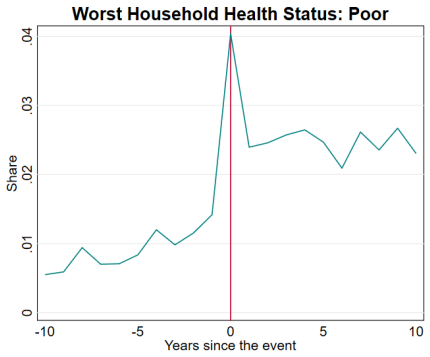


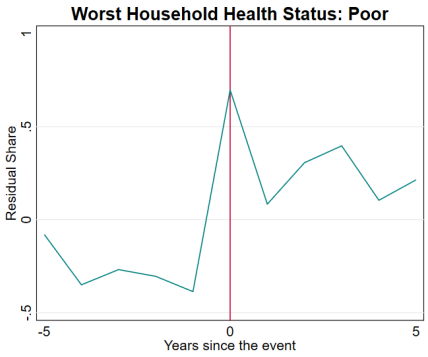


More

Evidence from Raw Data

Data Patterns: Exogenity of the Instrument





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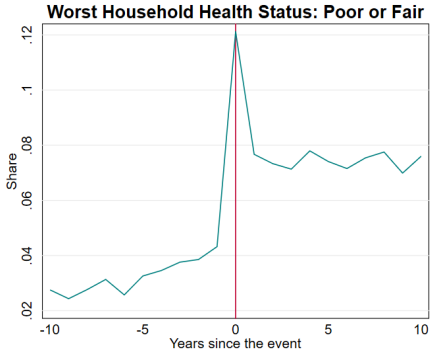
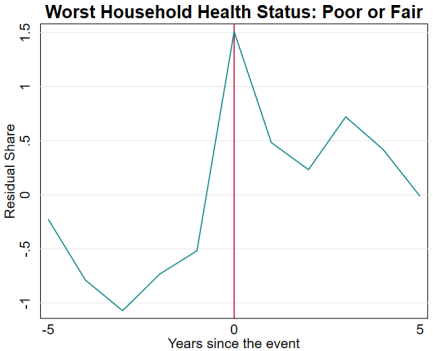
Data Patterns: Exogenity of the Instrument





Results

First Stage Results

$$CR_{it} = \alpha_i + \xi_t + \eta Injury_{it} + X'_{it}\pi + u_{it}$$

	Time Period				
	t-2	t-1	Main Sample (t)	t+1	t+2
VARIABLES	**Care Giver of a Person with Disability/Long-term Health Cond.**				
Serious injury/illness to a family member	−0.000	0.002	0.015***	0.012***	0.08***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Observations	123,086	136,927	151,715	135,752	121,447
VARIABLES			**Main Carer**		
Serious injury/illness to a family member	-0.001	0.002	0.011***	0.007***	0.006***
	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]
Observations	123,086	136,927	151,715	135,752	121,447
VARIABLES			**Hours of Care**		
Serious injury/illness to a family member	-0.054	0.307***	0.926***	0.414***	0.298***
	[0.072]	[0.069]	[0.085]	[0.081]	[0.081]
Observations	109,305	121,995	135,577	121,124	108,549

Complier Characteristics

	Carer of a person with Disability		Main Carer	
	Young	Old	Young	Old
Instrument	0.008***	0.017***	0.005**	0.013***
Relative Likelihood	0.532	1.131	0.443	1.152
	Male	Female	Male	Female
Instrument	0.014***	0.016***	0.009***	0.013***
Relative Likelihood	0.932	1.065	0.798	1.152
	College degree	No-College degree	College degree	No-College degree
Instrument	0.013***	0.016***	0.008***	0.013***
Relative Likelihood	0.865	1.065	0.709	1.152
	Young & Male	Old & Male	Young & Male	Old & Male
Instrument	0.004	0.016***	0.002	0.010***
Relative Likelihood	0.266	1.065	0.177	0.886
	Young & Female	Old & Female	Young & Female	Old & Female
Instrument	0.010***	0.017***	0.007**	0.015***
Relative Likelihood	0.665	1.131	0.620	1.329
	Major City	Not Major City	Major City	Not Major City
Instrument	0.013***	0.018***	0.010***	0.014***
Relative Likelihood	0.865	1.198	0.886	1.241

Reduced Form: Labour Market Results

$$Y_{it} = \alpha_i + \xi_t + \eta Injury_{it} + X'_{it}\pi + u_{it}$$

	Emp.	NILF	Real Wage Inc. (Cond.)	Real Wage Inc.	Hours (Cond.)
Serious injury/illness to a family member	-0.002 [0.002]	0.003 [0.002]	-4.115 [9.446]	-7.479 [8.326]	-0.099 [0.087]
Observations	151,715	151,715	116,775	151,715	116,775
	Hours	**Life Satisfac.**	**Part-time work**	**Not working for care**	
Serious injury/illness to a family member	-0.182* [0.098]	-0.010 [0.008]	-0.001 [0.003]	0.005*** [0.001]	
Observations	151,715	151,670	151,715	151,715	

Main Results

	Emp.	NILF	Real Wage Inc. (C.)	Real Wage Inc.	Hours (C.)	Hours
Carer	-0.107	0.180	-295.453	-497.742	-7.108	**-12.107***
	[0.151]	[0.146]	[679.178]	[556.654]	[6.302]	**[6.589]**
Mean of dep. var.	0.774	0.195	2256	1751	38.08	29.43
Observations	151,715	151,715	116,775	151,715	116,775	151,715
F statistic	82.13	82.13	68.06	82.13	68.06	82.13
Main Carer	-0.142	0.239	-422.065	-662.805	-10.155	**-16.122***
	[0.201]	[0.194]	[970.405]	[742.101]	[9.019]	**[8.822]**
Mean of dep. var.	0.774	0.195	2256	1751	38.08	29.43
Observations	151,715	151,715	116,775	151,715	116,775	151,715
F statistic	57.31	57.31	47.80	57.31	47.80	57.31
Hours of Care	-0.003	0.004	-14.106	-13.348	-0.128	**-0.215***
	[0.003]	[0.003]	[16.766]	[9.476]	[0.156]	**[0.112]**
Mean of dep. var.	0.768	0.201	2267	1746	38.07	29.18
Observations	135,577	135,577	103,385	135,577	103,385	135,577
F statistic	119.5	119.5	104.7	119.5	104.7	119.5

◂ OLS-FE

Main Results

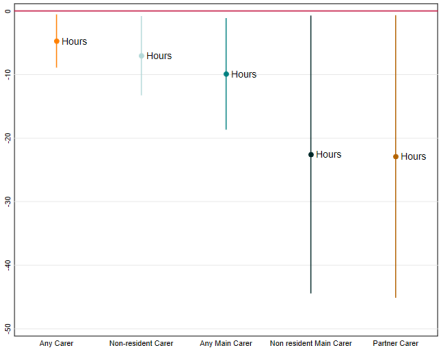
VARIABLES	Life Satisfaction	Part-time work	Not working for care
Carer	-0.698	-0.056	**0.344*** **
	[0.537]	[0.184]	**[0.066]**
Mean of dep. var.	7.804	0.218	0.00692
Observations	151,670	151,715	151,715
F statistic	82.25	82.13	82.13
Main Carer	-0.929	-0.075	**0.458*** **
	[0.718]	[0.245]	**[0.093]**
Mean of dep. var.	7.804	0.218	0.00692
Observations	151,670	151,715	151,715
F statistic	57.37	57.31	57.31
Hours of Care	-0.013	-0.002	**0.006*** **
	[0.009]	[0.003]	**[0.001]**
Mean of dep. var.	7.801	0.215	0.00700
Observations	135,537	135,577	135,577
F statistic	120.0	119.5	119.5

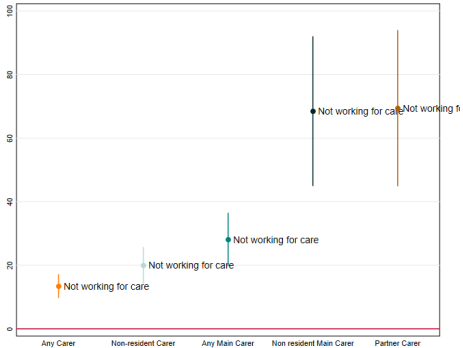
Main Results

VARIABLES	Emp	NILF	Hours (Cond.)	Hours	Life Satis.	Part-time	Not working for care
Any Carer	-0.042	0.070	-2.770	-4.727*	-0.273	-0.022	0.134***
	[0.059]	[0.057]	[2.444]	[2.540]	[0.210]	[0.072]	[0.023]
F-statistic	272.1	272.1	201.3	272.1	271.5	272.1	272.1
Non-res Carer	-0.062	0.104	-4.119	-7.036*	-0.407	-0.033	0.200***
	[0.088]	[0.084]	[3.643]	[3.792]	[0.313]	[0.107]	[0.035]
F-statistic	189.8	189.8	136.5	189.8	189.1	189.8	189.8
Any Main Carer	-0.087	0.147	-6.127	-9.895*	-0.572	-0.046	0.281***
	[0.123]	[0.119]	[5.414]	[5.333]	[0.441]	[0.150]	[0.051]
F-statistic	106.6	106.6	84.26	106.6	106.2	106.6	106.6
Non-res Main Carer	-0.181	0.335	-13.053	-22.576*	-1.417	-0.111	0.685***
	[0.302]	[0.292]	[12.339]	[13.289]	[1.096]	[0.366]	[0.143]
F-statistic	46.37	46.37	39.04	46.37	45.88	46.37	46.37
Partner Carer	-0.184	0.340	-15.218	-22.892*	-1.419	-0.113	0.694***
	[0.307]	[0.297]	[14.395]	[13.509]	[1.087]	[0.371]	[0.149]
F-statistic	46.93	46.93	34.17	46.93	47.51	46.93	46.93
Mean of dep. var.	0.774	0.195	38.08	29.43	7.804	0.218	0.00692
Observations	151,715	151,715	116,775	151,715	151,670	151,715	151,715

Main Results

- Unconditional hours of work
- Not looking for work - Ill health of someone other than self/other family reason





Heterogeneity

Heterogeneity by Age & Gender

First Stage

			Carer		
Variables	**Total**	**Male**	**Female**	**25-39 years-old**	**40-64 years-old**
Instrument	0.015***	0.014***	0.016***	0.008***	0.017***
	[0.002]	[0.002]	[0.002]	[0.003]	[0.002]
Mean of Dep. Var.	0.0434	0.0325	0.0529	0.0302	0.0517
Observations	151,715	70,745	80,970	57,679	93,156
			Main Carer		
Variables	**Total**	**Male**	**Female**	**25-39 years-old**	**40-64 years-old**
Instrument	0.011***	0.009***	0.013***	0.005**	0.013***
	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]
Mean of Dep. Var.	0.0338	0.0199	0.0460	0.0213	0.0418
Observations	151,715	70,745	80,970	57,679	93,156
			Hours of Care		
Variables	**Total**	**Male**	**Female**	**25-39 years-old**	**40-64 years-old**
Instrument	0.926***	0.571***	1.170***	0.355***	1.172***
	[0.085]	[0.106]	[0.122]	[0.090]	[0.117]
Mean of Dep. Var.	1.527	1.106	1.893	0.559	2.154

Heterogeneity by Gender

Reduced-Form Results

				Men			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Instrument	-0.003	0.006**	-0.051	-0.195	-0.007	-0.004	0.004***
	[0.003]	[0.003]	[0.127]	[0.156]	[0.012]	[0.003]	[0.001]
Observations	70,745	70,745	59,517	70,745	70,728	70,745	70,745
				Women			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Instrument	-0.002	0.002	-0.147	-0.232*	-0.018*	0.001	0.006***
	[0.003]	[0.003]	[0.117]	[0.123]	[0.011]	[0.004]	[0.001]
Observations	80,970	80,970	57,258	80,970	80,942	80,970	80,970

Heterogeneity by Gender

IV Results

					Men		
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Carer	-0.109	0.314	-1.940	-8.231	-0.244	-0.303	0.280***
	[0.225]	[0.211]	[8.785]	[11.264]	[0.844]	[0.244]	[0.093]
Mean of dep. var	0.781	0.114	43.37	33.82	7.737	0.0915	0.00375
Observations	70,745	70,745	59,517	70,745	70,728	70,745	70,745
F-statistic	33.15	33.15	34.20	33.15	33.26	33.15	33.15
					Women		
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Carer	-0.076	0.062	-9.947	-12.139	-0.975	0.067	0.389***
	[0.203]	[0.199]	[8.925]	[8.009]	[0.709]	[0.262]	[0.093]
Mean of dep. var	0.682	0.252	32.99	22.44	7.818	0.304	0.00905
Observations	80,970	80,970	57,258	80,970	80,942	80,970	80,970
F-statistic	47.75	47.75	33.01	47.75	47.78	47.75	47.75

Heterogeneity by Gender

IV Results

					Men		
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	-0.116	0.468	-1.962	-10.122	-0.412	-0.489	0.448***
	[0.364]	[0.345]	[13.795]	[18.237]	[1.355]	[0.399]	[0.161]
Mean of dep. var	0.845	0.122	43.13	36.37	7.764	0.100	0.00411
Observations	70,745	70,745	59,517	70,745	70,728	70,745	70,745
F-statistic	19.61	19.61	24.05	19.61	19.71	19.61	19.61
					Women		
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	-0.092	0.076	-13.224	-14.714	-1.182	0.081	0.471***
	[0.246]	[0.241]	[11.974]	[9.765]	[0.864]	[0.317]	[0.118]
Mean of dep. var	0.713	0.259	32.83	23.35	7.838	0.321	0.00938
Observations	80,970	80,970	57,258	80,970	80,942	80,970	80,970
F-statistic	36.59	36.59	23.65	36.59	36.56	36.59	36.59

Heterogeneity by Age

Reduced Form Results

				25-39 years-old			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Instrument	-0.002	0.003	-0.098	-0.237	-0.031**	0.002	0.003**
	[0.004]	[0.004]	[0.149]	[0.173]	[0.014]	[0.005]	[0.001]
Observations	57,679	57,679	46,298	57,679	57,668	57,679	57,679
				40-64 years-old			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Instrument	-0.005*	0.005**	-0.104	-0.278**	-0.005	-0.004	0.006***
	[0.003]	[0.002]	[0.105]	[0.116]	[0.010]	[0.003]	[0.001]
Observations	93,156	93,156	69,573	93,156	93,122	93,156	93,156

Heterogeneity by Age

IV Results

				25-39 years-old			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Carer	-0.076	0.297	-9.975	-18.053	-3.409*	0.205	0.346*
	[0.543]	[0.530]	[21.276]	[22.792]	[1.970]	[0.637]	[0.191]
Mean of dep. var.	0.810	0.152	38.35	31.03	7.834	0.206	0.00449
Observations	57,679	57,679	46,298	57,679	57,668	57,679	57,679
F statistic	9.916	9.916	7.307	9.965	9.992	9.916	9.916
				40-64 years-old			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Carer	-0.195	0.221	-5.228	-12.724*	-0.145	-0.207	0.357***
	[0.156]	[0.149]	[6.710]	[6.964]	[0.588]	[0.193]	[0.077]
Mean of dep. var.	0.752	0.222	37.89	28.42	7.784	0.225	0.00846
Observations	93,156	93,156	69,573	93,156	93,122	93,156	93,156
F statistic	62.27	62.27	49.94	62.27	62.31	62.27	62.27

Heterogeneity by Age

IV Results

				25-39 years-old			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	0.024	0.348	-15.652	-27.005	-5.095	0.311	0.516*
	[0.818]	[0.796]	[33.579]	[34.770]	[3.179]	[0.952]	[0.312]
Mean of dep. var.	0.810	0.152	38.35	31.03	7.834	0.206	0.00449
Observations	57,679	57,679	46,298	57,679	57,668	57,679	57,679
F statistic	6.092	6.092	4.524	6.092	6.162	6.092	6.092
				40-64 years-old			
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	-0.234	0.271	-6.784	-15.531*	-0.196	-0.264	0.456***
	[0.199]	[0.190]	[9.244]	[8.932]	[0.752]	[0.247]	[0.103]
Mean of dep. var.	0.752	0.222	37.89	28.42	7.784	0.225	0.00846
Observations	93,156	93,156	69,573	93,156	93,122	93,156	93,156
F statistic	46.08	46.08	37.34	46.08	46.06	46.08	46.08

Heterogeneity by Gender & Age

IV Results

VARIABLES	Emp	NILF	Hours(C.)	Hours	Life Satis.	Part-time work	Not working for care
40-64 years-old and Men							
Carer	-0.183	0.415*	-3.309	-10.556	1.053	-0.475*	0.364***
	[0.244]	[0.238]	[9.483]	[12.199]	[0.888]	[0.268]	[0.118]
Mean of dep. var	0.813	0.159	43.06	34.93	7.745	0.107	0.00526
Observations	43,558	43,558	35,231	43,558	43,545	43,558	43,558
F-statistic	24.98	24.98	24.93	24.98	25.00	24.98	24.98
40-64 years-old and Women							
VARIABLES	**Emp**	**NILF**	**Hours(C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Carer	-0.209	0.100	-9.114	-14.434*	-1.012	-0.033	0.359***
	[0.207]	[0.198]	[9.614]	[8.484]	[0.826]	[0.277]	[0.105]
Mean of dep. var	0.698	0.277	32.60	22.69	7.819	0.329	0.0113
Observations	49,598	49,598	34,342	49,598	49,577	49,598	49,598
F-statistic	35.50	35.50	24.46	35.50	35.53	35.50	35.50

Effect on Retirement

IV Results

	Retirement			
	Main Sample	**Males**	**Female**	**40-64 years-old**
Carer	0.072	0.071	0.078	0.124
	[0.086]	[0.128]	[0.116]	[0.114]
Mean of Dep. Var.	0.0571	0.0437	0.0688	0.0932
Observations	151,715	70,745	80,970	93,156
F Statistic	82.13	33.15	47.75	62.27
	Main Sample	**Males**	**Female**	**40-64 years-old**
Main Carer	0.096	0.113	0.095	0.158
	[0.114]	[0.204]	[0.141]	[0.145]
Mean of Dep. Var.	0.0571	0.0437	0.0688	0.0932
Observations	151,715	70,745	80,970	93,156
F Statistic	57.31	19.61	36.59	46.08

Effect on Getting Carer Allowance and Carer Payment

IV Results

	Carer Allowance		Carer Payment	
Variables	**t**	**t+1**	**t**	**t+1**
Instrument	0.001 [0.001]	0.002* [0.001]	0.001 [0.001]	0.004*** [0.001]
Observations	151,715	151,715	151,715	151,715
Carer	0.077 [0.072]	0.150* [0.077]	0.039 [0.071]	0.289*** [0.073]
Observations	151,715	151,715	151,715	151,715
F-stat	82.13	82.13	82.13	82.13

More

Effect on Getting Carer Allowance and Carer Payment-Female

IV Results

	Carer Allowance		Carer Payment	
Variables	**t**	**t+1**	**t**	**t+1**
Instrument	0.001	0.001	0.002	0.005***
	[0.002]	[0.002]	[0.002]	[0.002]
Observations	80,970	80,970	80,970	80,970
Carer	0.046	0.094	0.116	0.338***
	[0.101]	[0.108]	[0.101]	[0.103]
Observations	80,970	80,970	80,970	80,970
F-stat	47.75	47.75	47.75	47.75

Effect on Getting Carer Allowance and Carer Payment-Male

IV Results

	Carer Allowance		Carer Payment	
Variables	**t**	**t+1**	**t**	**t+1**
Instrument	0.002	0.003**	-0.001	0.003**
	[0.001]	[0.001]	[0.001]	[0.001]
Observations	70,745	70,745	70,745	70,745
Carer	0.120	0.222**	-0.095	0.202**
	[0.098]	[0.105]	[0.091]	[0.094]
Observations	70,745	70,745	70,745	70,745
F-stat	33.15	33.15	33.15	33.15

Robustness

Robustness

Control the health status of the person with the worst health in the household

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time work	Not working for care
Carer	-0.067	0.126	-7.722	-11.954*	-0.399	-0.035	0.364***
	[0.163]	[0.157]	[6.673]	[7.111]	[0.574]	[0.198]	[0.072]
Mean of dep. var	0.774	0.195	38.08	29.43	7.804	0.218	0.00692
Observations	150,645	150,645	116,198	150,645	150,600	150,645	150,645
F statistic	72.14	72.14	62.30	72.14	72.25	72.14	72.14
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	-0.091	0.171	-11.188	-16.176*	-0.540	-0.048	0.492***
	[0.220]	[0.212]	[9.693]	[9.682]	[0.778]	[0.268]	[0.105]
Mean of dep. var	0.774	0.195	38.08	29.43	7.804	0.218	0.00692
Observations	150,645	150,645	116,198	150,645	150,600	150,645	150,645
F statistic	48.91	48.91	42.70	48.91	48.97	48.91	48.91
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Hours of Care	-0.002	0.003	-0.134	-0.197*	-0.007	-0.001	0.006***
	[0.003]	[0.003]	[0.158]	[0.114]	[0.009]	[0.003]	[0.001]
Mean of dep. var	0.768	0.201	38.07	29.18	7.801	0.215	0.00700
Observations	134,757	134,757	102,937	134,757	134,717	134,757	134,757
F statistic	118.3	118.3	102.1	118.3	118.8	118.3	118.3

Robustness

Drop individuals aged between 55 to 64 - as they may opt for early retirement

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time work	Not working for care
Carer	-0.174	0.267	-6.295	-10.553	-0.615	-0.150	0.302***
	[0.182]	[0.175]	[6.917]	[7.985]	[0.651]	[0.222]	[0.075]
Mean of dep. var.	0.817	0.150	38.49	31.40	7.768	0.218	0.00643
Observations	120,672	120,672	98,035	120,672	120,649	120,672	120,672
F statistic	59.69	59.69	58.16	59.69	59.79	59.69	59.69
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	-0.261	0.401	-9.499	-15.864	-0.924	-0.225	0.454***
	[0.275]	[0.267]	[10.457]	[12.115]	[0.983]	[0.335]	[0.123]
Mean of dep. var.	0.817	0.150	38.49	31.40	7.768	0.218	0.00643
Observations	120,672	120,672	98,035	120,672	120,649	120,672	120,672
F statistic	34.02	34.02	36.89	34.02	34.11	34.02	34.02
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Hours of Care	-0.004	0.005	-0.149	-0.201	-0.017	-0.002	0.006***
	[0.004]	[0.003]	[0.196]	[0.154]	[0.013]	[0.004]	[0.001]
Mean of dep. var.	0.813	0.153	38.48	31.24	7.765	0.216	0.00648
Observations	107,632	107,632	86,925	107,632	107,610	107,632	107,632
F statistic	77.51	77.51	79.28	77.51	77.22	77.51	77.51

Robustness

Exclude COVID Period (Post-2019)

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time work	Not working for care
Carer	-0.146	0.162	-8.913	-12.551*	-0.550	0.025	0.339***
	[0.154]	[0.147]	[6.977]	[6.632]	[0.552]	[0.185]	[0.067]
Mean of dep. var.	0.773	0.197	38.21	29.49	7.794	0.216	0.00709
Observations	131,866	131,866	101,285	131,866	131,831	131,866	131,866
F statistic	79.82	79.82	53.06	79.82	79.88	79.82	79.82
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	-0.198	0.220	-13.633	-17.043*	-0.747	0.035	0.460***
	[0.209]	[0.200]	[10.754]	[9.078]	[0.751]	[0.251]	[0.097]
Mean of dep. var.	0.773	0.197	38.21	29.49	7.794	0.216	0.00709
Observations	131,866	131,866	101,285	131,866	131,831	131,866	131,866
F statistic	52.51	52.51	31.99	52.51	52.52	52.51	52.51
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Hours of Care	-0.004	0.004	-0.185	-0.235**	-0.011	0.000	0.006***
	[0.003]	[0.003]	[0.162]	[0.114]	[0.010]	[0.003]	[0.001]
Mean of dep. var.	0.765	0.204	38.22	29.19	7.790	0.213	0.00721
Observations	116,810	116,810	88,715	116,810	116,780	116,810	116,810
F statistic	115.5	115.5	93.58	115.5	115.9	115.5	115.5

Robustness

Exclude Post-NDIS Period (Post-2016)

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time work	Not working for care
Carer	-0.212	0.127	-5.461	-13.133*	-0.832	0.110	0.317***
	[0.179]	[0.168]	[7.819]	[7.710]	[0.635]	[0.212]	[0.075]
Mean of dep. var.	0.770	0.200	38.26	29.42	7.786	0.216	0.00716
Observations	101,447	101,447	77,546	101,447	101,420	101,447	101,447
F statistic	61.89	61.89	43.79	61.89	61.96	61.89	61.89

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time work	Not working for care
Main Carer	-0.212	0.127	-5.461	-13.133*	-0.832	0.110	0.317***
	[0.179]	[0.168]	[7.819]	[7.710]	[0.635]	[0.212]	[0.075]
Mean of dep. var.	0.770	0.200	38.26	29.42	7.786	0.216	0.00716
Observations	101,447	101,447	77,546	101,447	101,420	101,447	101,447
F statistic	61.89	61.89	43.79	61.89	61.96	61.89	61.89

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time work	Not working for care
Hours of Care	-0.005*	0.003	-0.124	-0.253*	-0.016	0.002	0.006***
	[0.003]	[0.003]	[0.186]	[0.134]	[0.011]	[0.004]	[0.001]
Mean of dep. var.	0.761	0.208	38.29	29.10	7.783	0.212	0.00739
Observations	89,418	89,418	67,459	89,418	89,394	89,418	89,418
F statistic	90.71	90.71	68.90	90.71	91.20	90.71	90.71

Robustness

Exclude Self-Injured Individuals

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time work	Not working for care
Carer	-0.130	0.202	-8.554	-14.406**	-1.025*	-0.006	0.355***
	[0.160]	[0.152]	[7.220]	[7.063]	[0.561]	[0.198]	[0.070]
Mean of dep. Var.	0.786	0.184	38.09	29.91	7.856	0.220	0.00657
Observations	139,409	139,409	108,953	139,409	139,369	139,409	139,409
F statistic	71.97	71.97	51.02	71.97	72.20	71.97	71.97
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Main Carer	-0.161	0.259	-11.752	-18.551*	-1.366*	-0.008	0.471***
	[0.213]	[0.203]	[10.324]	[9.487]	[0.751]	[0.263]	[0.097]
Mean of dep. Var.	0.786	0.184	38.09	29.91	7.856	0.220	0.00657
Observations	139,409	139,409	108,953	139,409	139,369	139,409	139,409
F statistic	51.04	51.04	36.32	51.04	51.27	51.04	51.04
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time work**	**Not working for care**
Hours of Care	-0.003	0.004	-0.158	-0.250**	-0.019*	-0.001	0.006***
	[0.003]	[0.003]	[0.171]	[0.125]	[0.010]	[0.004]	[0.001]
Mean of dep. Var.	0.780	0.189	38.08	29.66	7.855	0.218	0.00661
Observations	124,447	124,447	96,414	124,447	124,412	124,447	124,447
F statistic	97.77	97.77	90.74	97.77	97.25	97.77	97.77

Robustness

Testing Identifying Assumptions

- We use the test suggested by Mourifie and Wan [2017] to check whether exclusion, independence, and monotonicity assumptions hold in our setting.
- Adjust the standard errors as new work by Lee et al. [2022] suggests that unless the first-stage F-statistic is above 104.7, standard errors need to be adjusted.
  - Use Anderson-Rubin (AR) test (Keane and Neal [2023]) and construct IV confidence intervals
  - Use tF-procedure described in Lee et al. [2022] and construct IV confidence intervals
  - Our significant results continue to remain significant after adjustment.

Conclusion

Conclusion

- **Serious injury/illness to a family member**
  - Increases the probability of being carer (1.5 ppt) /main carer (1.1 ppt) or hours of care per week(56 minutes).
  - Decreases unconditional hours of work per week by 11 minutes

Conclusion

- **Being a carer of a person with disability**
  - Decreases hours of work per week by 12-16 hours.
    - Driven by the decrease in employment and decrease in hours of work while employed
  - Increases the probability of stating that not working because of ill health of someone.
  - Find strong evidence that caring decreases life satisfaction
  - Find evidence in the decrease in employment and increase in getting out of labour force, but these results are insignificant.
  - Increase in individuals' probability of reporting not looking for work because of the ill health of someone other than self or other family reasons
  - Increase the probability of receiving carer allowance and carer payment in the next period.

Conclusion

- **Heterogeneity Analysis show that**
  - **For men**: taking up a caring role increases their probability of being out of labour force, and decreases their part-time employment
  - **For women**: being a carer decreases unconditional hours of work significantly, with insignificant and much smaller coefficients for not being in the labour force and part-time work.
    - **Women combine caregiving and employment, while men leave the labour market!**
  - **For individuals aged 25-39 years**: Caring decreases life satisfaction
  - **For individuals aged 40-64 years**: Caring decreases the hours of work

OLS-FE Regression Results

VARIABLES	Emp	NILF	Hours (C.)	Hours	Life Satis.	Part-time Work	Not working for care
Carer	-0.039***	0.049***	-1.188***	-1.906***	-0.018	-0.001	0.033***
	[0.006]	[0.007]	[0.250]	[0.246]	[0.023]	[0.007]	[0.004]
Obs.	151,715	151,715	116,775	151,715	151,670	151,715	151,715
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time Work**	**Not working for care**
Main Carer	-0.054***	0.068***	-1.838***	-2.646***	-0.024	0.001	0.043***
	[0.008]	[0.008]	[0.308]	[0.282]	[0.026]	[0.008]	[0.005]
Obs.	151,715	151,715	116,775	151,715	151,670	151,715	151,715
VARIABLES	**Emp**	**NILF**	**Hours (C.)**	**Hours**	**Life Satis.**	**Part-time Work**	**Not working for care**
Hours of Care	-0.002***	0.002***	-0.060***	-0.067***	-0.001	-0.001***	0.001***
	[0.000]	[0.000]	[0.010]	[0.006]	[0.001]	[0.000]	[0.000]
Obs.	135,577	135,577	103,385	135,577	135,537	135,577	135,577

Back

Effect on Getting Carer Allowance and Carer Payment

IV Results

	Carer Allowance		Carer Payment	
Variables	**t**	**t+1**	**t**	**t+1**
Main Carer	0.103	0.199**	0.051	0.385***
	[0.095]	[0.102]	[0.094]	[0.097]
Observations	151,715	151,715	151,715	151,715
F-stat	57.31	57.31	57.31	57.31
Hours of Care	0.002	0.003*	0.000	0.005***
	[0.001]	[0.001]	[0.001]	[0.001]
Observations	135,577	135,577	135,577	135,577
F-stat	119.5	119.5	119.5	119.5

Back