

# Appendices

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## A. Outcome Structure and Basic Statistics

**Table A1. The structure of the outcomes**

	Main outcomes	Breakdowns
<b>Physical health</b>	1. Any symptom	1) Musculoskeletal system 2) Systemic symptoms 3) Chest 4) Limb 5) Respiratory 6) Eye and ear 7) Digestive system 8) Gum 9) Skin 10) Urinary tract 11) Injury
	2. Outpatient visits	
	3. ADL limitations	
	4. Self-rated poor health	
<b>Mental health</b>	5. Being stressed	1) Financial strain 2) Childcare and domestic work 3) Social networks 4) Having no free time 5) Marriage, love and sexual life 6) Reason for living 7) Own health and long-term care issues 8) Family relationships 9) Family health and long-term care issues

*Note:* All outcomes are binary. Each takes a value of one if the caregivers reported the corresponding condition and a value of zero if they did not.

**Table A2. Trends in proportions of each care-required level over time**

	<b>2001</b>	<b>2004</b>	<b>2007</b>	<b>2010</b>	<b>2013</b>	<b>Total</b>
<b>SL</b>	0.11	0.13				0.12
<b>SL1</b>			0.11	0.10	0.09	0.10
<b>SL2</b>			0.13	0.14	0.14	0.14
<b>CL1</b>	0.25	0.32	0.20	0.19	0.21	0.23
<b>CL2</b>	0.23	0.20	0.21	0.21	0.22	0.21
<b>CL3</b>	0.16	0.14	0.16	0.16	0.15	0.15
<b>CL4</b>	0.12	0.11	0.12	0.11	0.10	0.11
<b>CL5</b>	0.13	0.09	0.08	0.08	0.08	0.09
<b>N</b>	3,148	3,893	3,259	3,874	4,000	18,174

**Table A3. Changes in the characteristics of caregivers after the reform**

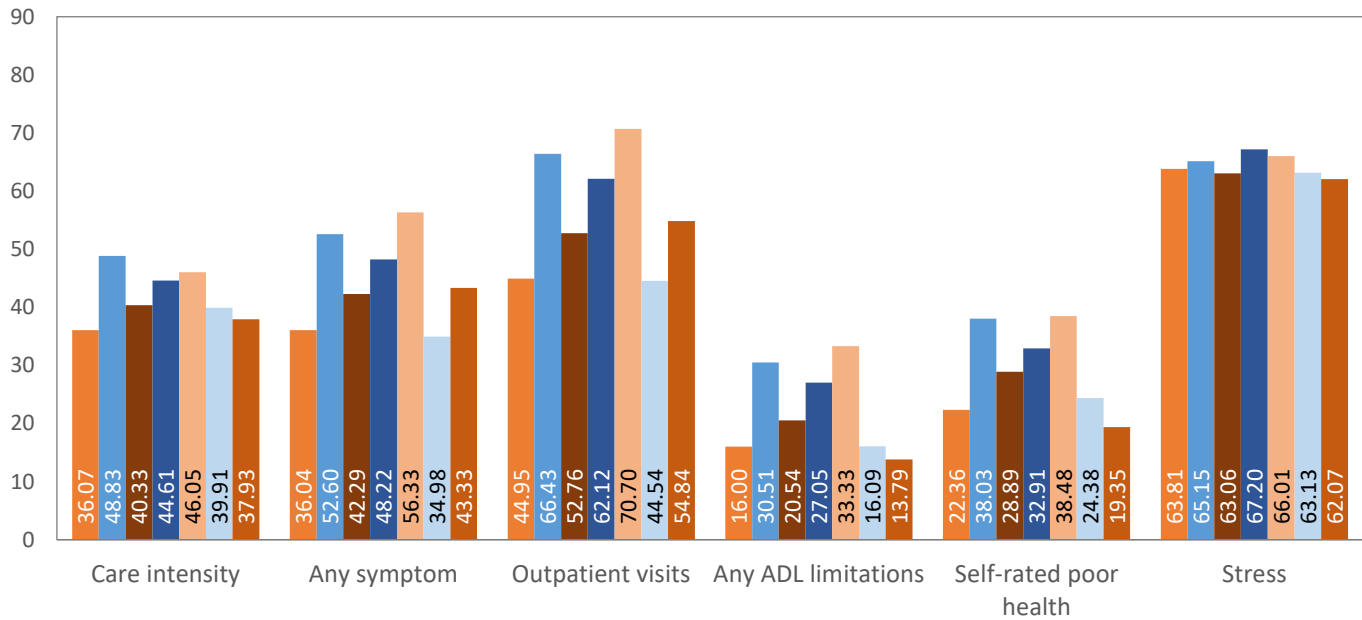
	Male caregivers				Female caregivers			
	Treat_Post	S.E.	N	R2	Treat_Post	S.E.	N	R2
Caregiver-recipient relationship								
Spouse	0.0634	(0.0620)	2,320	0.059	0.0898**	(0.0353)	6,376	0.027
Parent	-0.0715	(0.0616)	2,320	0.054	0.0316	(0.0306)	6,376	0.029
Par-in-law	0.0234	(0.0155)	2,320	0.057	-0.129***	(0.0365)	6,376	0.051
Income								
Low-HH Exp	-0.0169	(0.0594)	2,320	0.095	-0.00995	(0.0373)	6,376	0.038
High-HH Exp	-0.00849	(0.0599)	2,320	0.080	-0.00113	(0.0370)	6,376	0.045
Marital status								
Married	0.0368	(0.0543)	2,320	0.048	-0.0297	(0.0272)	6,376	0.032
Single	-0.0403	(0.0466)	2,320	0.040	0.0221	(0.0197)	6,376	0.033
Widowed	-0.0119	(0.0203)	2,320	0.041	0.000919	(0.0156)	6,376	0.015
Divorced	0.0154	(0.0314)	2,320	0.039	0.00660	(0.0139)	6,376	0.022
Insurance								
Other health insurance	0.00361	(0.0180)	2,311	0.046	-0.00329	(0.00646)	6,348	0.017
National health insurance	0.0119	(0.0585)	2,311	0.134	0.0297	(0.0372)	6,348	0.052
Employee health insurance	-0.0821	(0.0562)	2,311	0.049	-0.0451	(0.0370)	6,348	0.027
Advance elderly health insurance	0.0666*	(0.0368)	2,311	0.240	0.0187	(0.0228)	6,348	0.165
Pension								
Basic pension	0.0598	(0.0411)	2,320	0.047	0.0555*	(0.0303)	6,376	0.029
Basic pension and employee pension	-0.0137	(0.0458)	2,320	0.059	-0.00931	(0.0226)	6,376	0.034
Basic pension and mutual aid pension	0.0218	(0.0210)	2,320	0.062	-0.00232	(0.00941)	6,376	0.017
National pension	0.0294	(0.0334)	2,320	0.073	0.0205	(0.0152)	6,376	0.038
Noncontributory pension	0.0314	(0.0453)	2,320	0.062	-0.0225	(0.0207)	6,376	0.023

Notes: Estimates are derived from estimating equation (1) without controlling for covariates. Outcomes are replaced by the covariates to test the changes in the characteristics of caregivers before and after the reform. Treat\_Post indicates  $\gamma$  in equation (2).

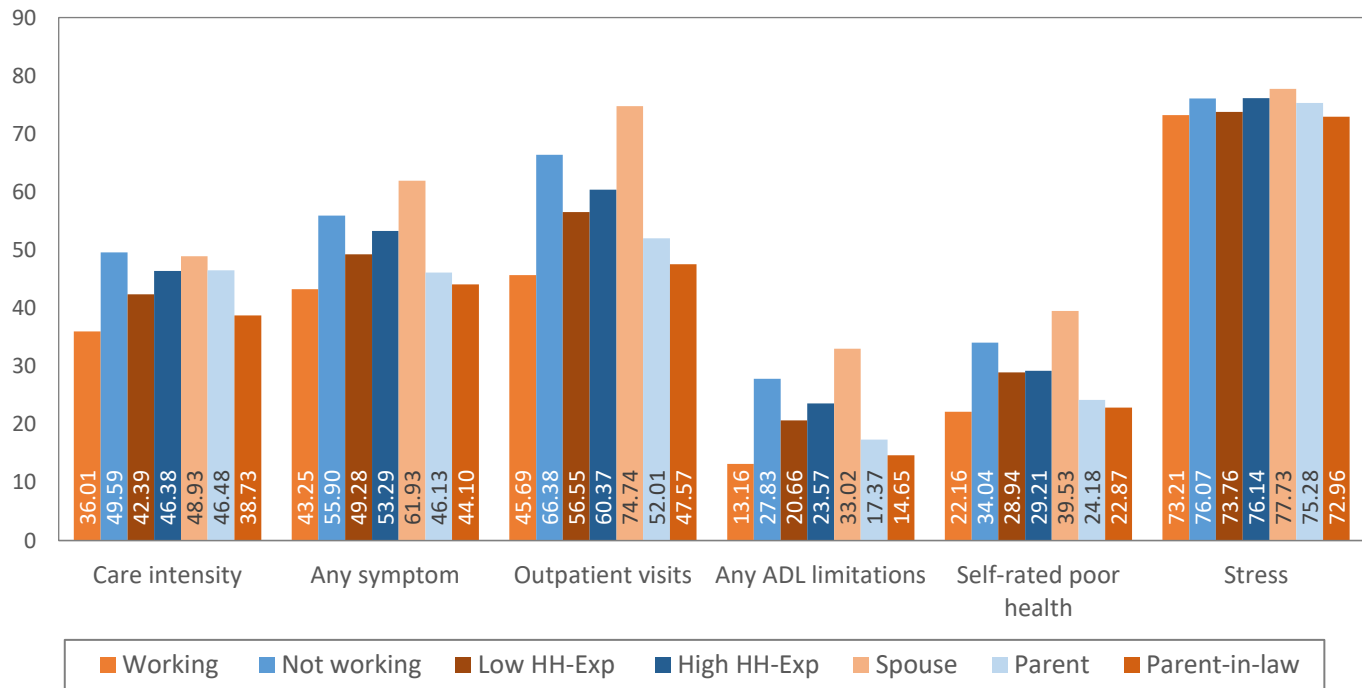
**Table A4. Basic statistics for treatment group, control group, and control group including caregivers of CL4-CL5 recipients**

	Treatment N=2,050 (1)	Control (caregivers of CL2-CL3) N=6,646 (2)	Robust (caregivers of CL2-CL5) N=10,777 (3)	T-test (3)-(2)
<b>Caregiver's demographic status</b>				
Female (%)	69.07	74.63	74.70	0.08
Recipient-caregiver relationship				
Spouse	34.63	40.03	40.35	0.42
Parent	30.88	28.19	28.96	1.10
Parent-in-law	31.60	27.81	26.65	-1.68
<b>Caregiver's socio-economic status</b>				
Working (%)	48.03	39.56	38.36	-1.58
Household Per-capita Expenditure < median (%)	52.73	49.56	49.60	0.05
<b>Recipient's conditions</b>				
Cerebrovascular	13.95	36.00	39.32	4.39
Debilitation	22.88	26.56	24.88	-2.48
Dementia	5.80	26.89	26.96	0.09
Broken bone	12.83	17.81	17.67	-0.25
Joint disorder	24.88	14.49	12.57	-3.62
<b>Covariates</b>				
Age (year)	61.91 (13.19)	63.87 (23.33)	64.17 (28.22)	0.72
Marital Status (%)				
Married	80.78	82.80	82.12	-1.15
Single	10.29	9.03	9.66	1.37
Widowed	3.90	4.48	4.55	0.21
Divorced	5.02	3.59	3.67	0.25
Health Insurance (%)				
National health insurance	50.37	53.66	55.40	2.24
Employee health insurance	37.81	33.70	32.57	-1.54
Advance elderly health insurance	10.64	11.09	10.59	-1.03
Others	1.18	1.56	1.44	-0.59
Pension (%)				
Basic pension	16.73	20.63	21.04	0.64
Basic pension and employee pension	11.46	15.09	15.01	-0.15
Basic pension and mutual aid pension	1.80	2.35	2.36	0.04
National pension	5.17	5.84	5.86	0.07
Noncontributory pension	0.00	0.02	0.01	-0.35
Employee pension	10.20	11.24	11.00	-0.50
Mutual aid pension	3.46	2.57	2.39	-0.74
Governmental pension	0.54	0.41	0.43	0.20
Household size (person)	3.53 (1.60)	3.60 (1.62)	3.62 (1.63)	1.05

## Male Caregivers

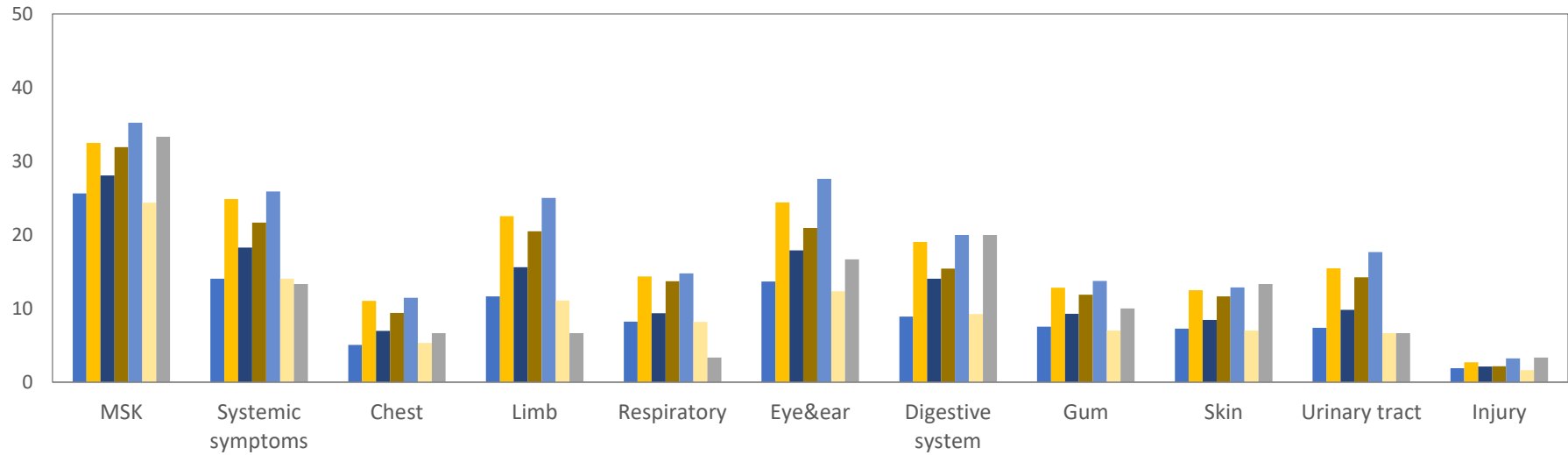


## Female Caregivers



**Figure A1. The statistics of main outcomes by gender and SES**

## Male Caregivers



## Female Caregivers

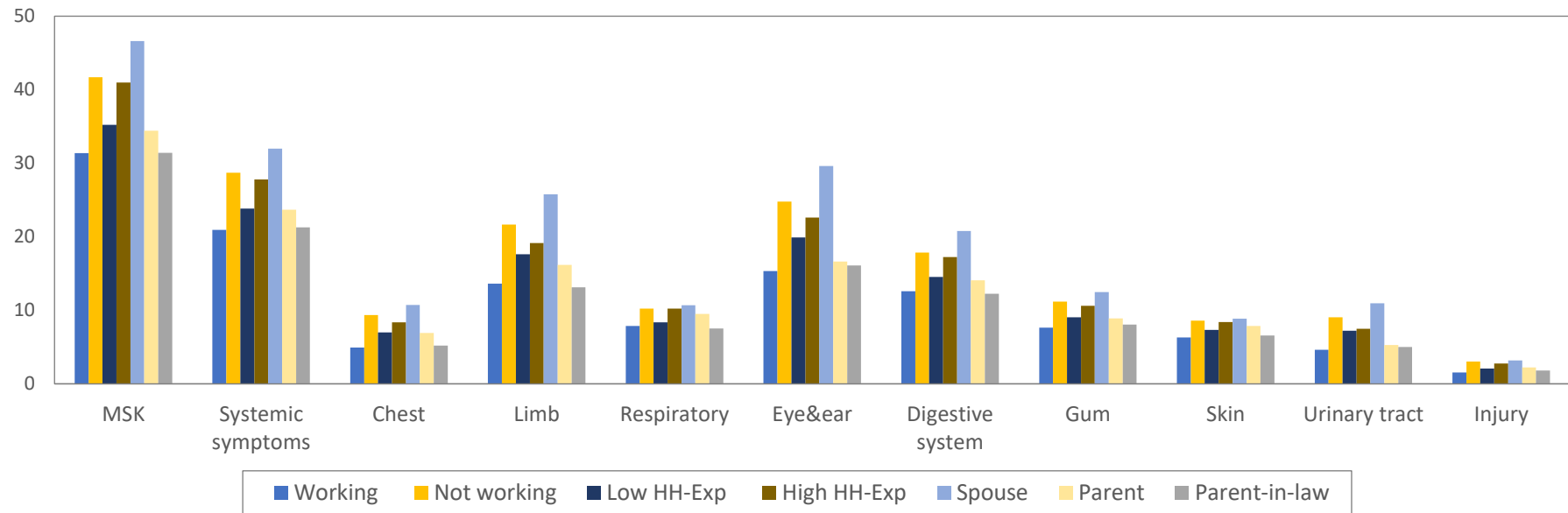
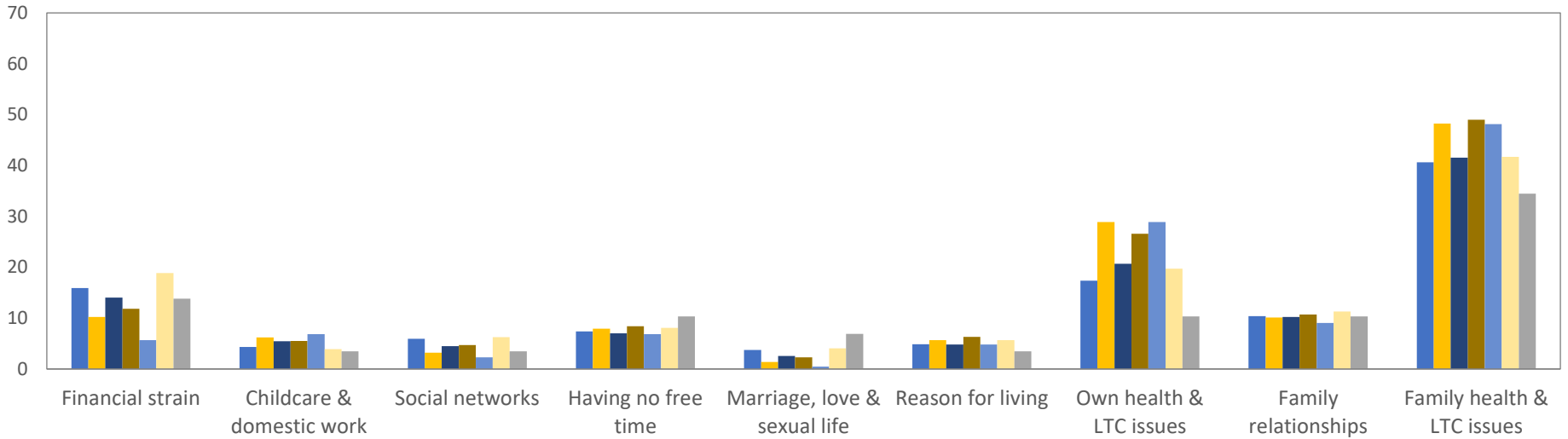


Figure A2. The statistics of specific symptoms by gender and SES

## Male Caregivers



## Female Caregivers

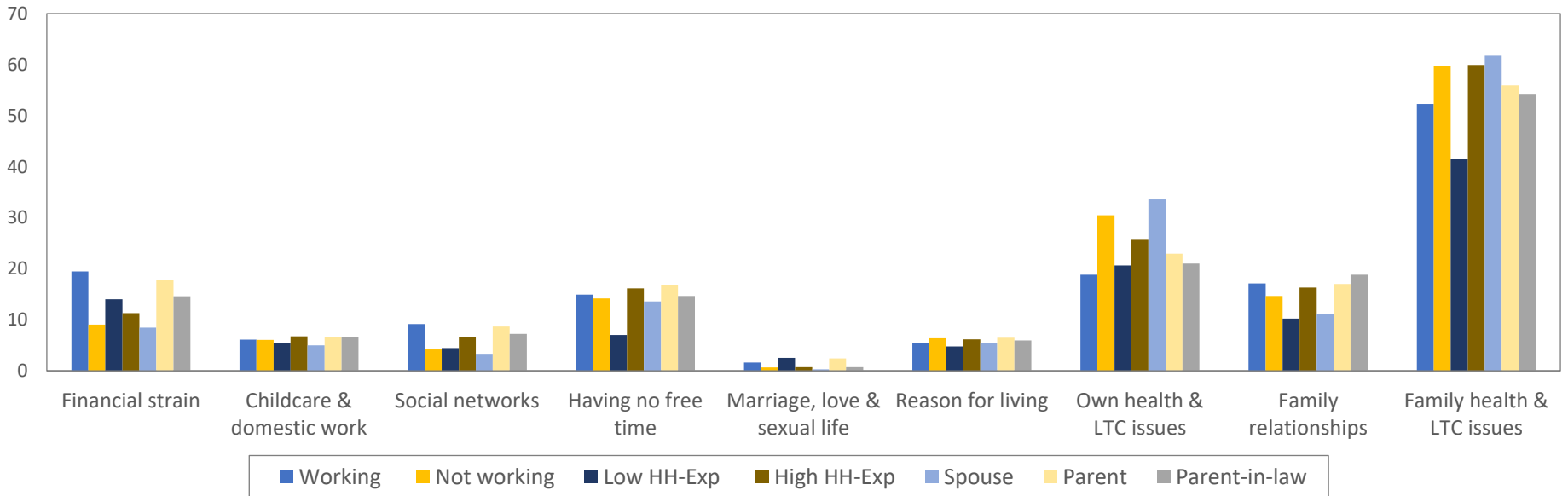


Figure A3. The statistics of specific reasons of being stressed by gender and SES



**Table A5. Basic statistics by gender and SES**

	<u>Working</u>		<u>Not working</u>		<u>Low HH-Exp</u>		<u>High HH-Exp</u>		<u>Spouse</u>		<u>Parent</u>		<u>Parent-in-law</u>	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	N=1095	N=2482	N=1172	N=3857	N=1136	N=3006	N=974	N=2840	N=1056	N=2317	N=1164	N=1345	N=31	N=2456
<b>Caregiver's demographic and SES statuses</b>														
Recipient-caregiver relationship														
Spouse	25.21	14.18	63.65	50.56	43.31	39.12	48.46	33.84						
Parent	68.77	27.28	33.45	16.77	52.82	20.23	47.02	21.90						
Parent-in-law	2.28	54.23	0.43	28.70	0.70	35.76	2.16	40.99						
Working (%)					46.95	40.13	48.74	37.90	27.01	15.29	65.76	51.13	83.33	54.87
Household Per-capita Expenditure < median (%)	52.94	52.90	54.72	50.56					51.04	55.03	56.71	49.43	27.59	48.01
<b>Covariates</b>														
Age (year)	58.67	55.62	72.26	66.68	65.04	62.75	66.19	62.03	78.03	73.21	56.76	55.94	59.19	56.32
	(11.67)	(9.64)	(29.58)	(18.88)	(13.95)	(12.38)	(12.63)	(11.42)	(41.00)	(20.83)	(8.74)	(9.04)	(8.19)	(7.79)
Marital Status (%)														
Married	66.39	81.55	79.86	88.49	69.19	83.97	79.16	87.57	100.00	100.00	51.80	49.00	83.87	95.85
Single	22.01	8.18	13.05	5.34	20.86	6.49	12.83	6.34	0.00	0.00	31.36	25.50	0.00	0.04
Widowed	3.47	4.83	3.16	4.41	3.26	5.46	3.39	3.91	0.00	0.00	5.50	11.30	16.13	4.07
Divorced	8.13	5.44	3.92	1.76	6.69	4.09	4.62	2.18	0.00	0.00	11.17	13.90	0.00	0.00
Health Insurance (%)														
National health insurance	43.25	43.69	63.65	58.33	55.15	56.44	49.95	48.02	52.37	60.86	54.67	52.75	61.29	44.96
Health insurance	50.78	53.68	9.56	26.07	26.87	31.75	31.17	41.98	13.85	13.78	41.78	45.37	32.26	53.86
Advance elderly health insurance	4.59	1.70	23.63	14.32	15.07	10.34	16.82	9.29	31.69	23.97	0.87	0.53	0.00	0.41
Others	1.38	0.93	3.16	1.27	2.91	1.47	2.06	0.71	2.09	1.39	2.68	1.36	6.45	0.78
Pension (%)														
Basic pension	11.42	12.25	13.14	28.83	14.17	25.35	9.24	19.68	17.42	40.61	8.43	11.78	9.68	11.24
Basic pension & employee pension	11.69	6.12	27.47	16.00	17.61	11.88	24.23	13.03	26.99	18.60	13.77	9.32	12.90	8.11
Basic pension & mutual aid pension	1.37	0.73	5.38	2.44	1.67	1.26	6.06	2.57	4.92	2.46	2.24	1.86	3.23	1.10
National pension	3.01	0.93	11.43	7.60	9.51	5.76	5.24	4.23	16.19	12.73	0.09	0.30	0.00	0.04
Employee pension	8.49	6.04	23.12	11.12	16.29	9.25	16.53	9.12	24.81	11.87	8.86	7.01	6.45	7.41
Mutual aid pension	3.11	0.64	7.68	2.51	4.14	1.06	7.49	2.64	8.24	2.42	3.18	1.42	9.68	1.55
Governmental pension	0.55	0.00	2.05	0.21	1.32	0.20	1.03	0.04	2.84	0.04	0.00	0.15	0.00	0.00
Household size (person)	3.41	4.13	2.91	3.49	3.20	3.79	3.08	3.65	2.91	3.14	3.31	3.46	3.58	4.44
	(1.53)	(1.59)	(1.38)	(1.60)	(1.55)	(1.72)	(1.41)	(1.51)	(1.48)	(1.60)	(1.42)	(1.36)	(1.26)	(1.47)

## B. Placebo tests and model specifications

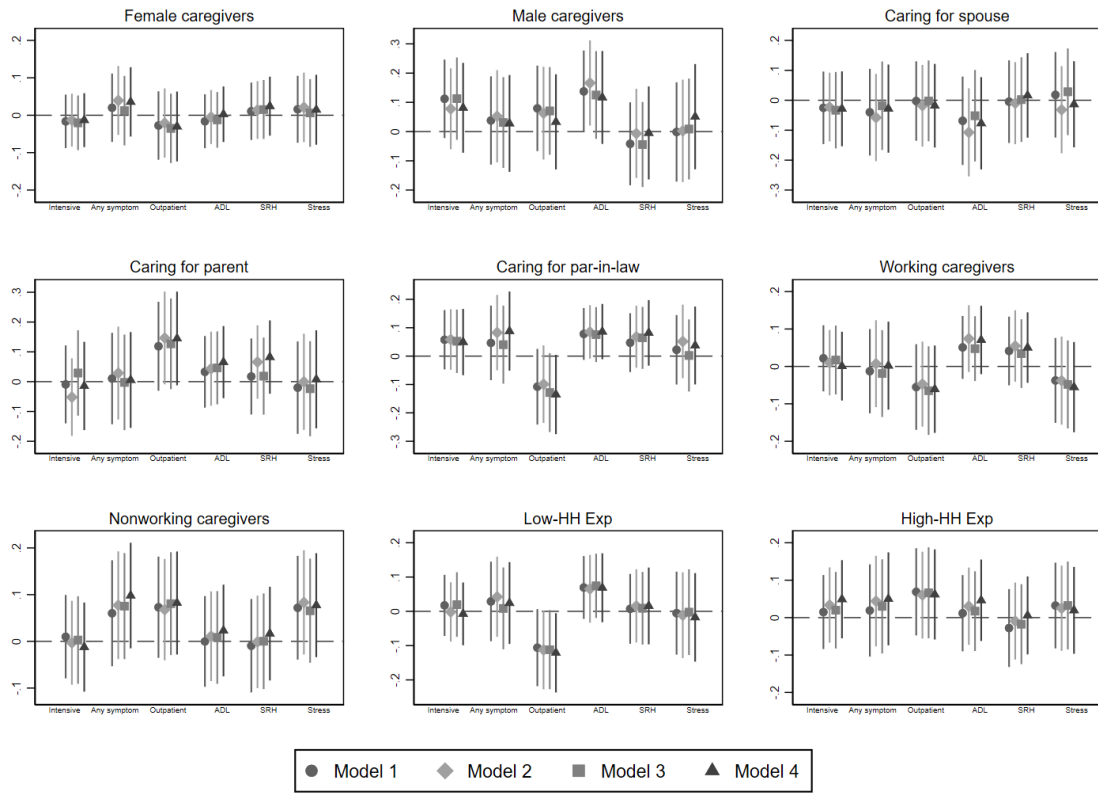
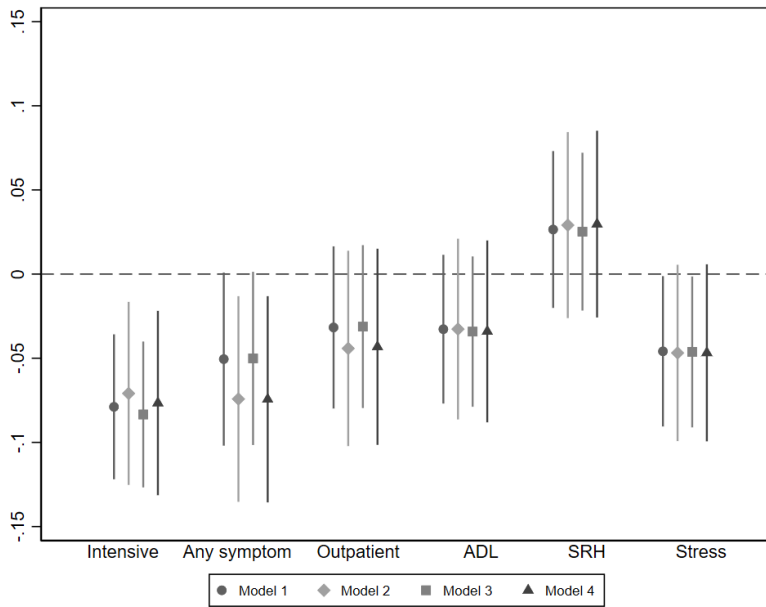
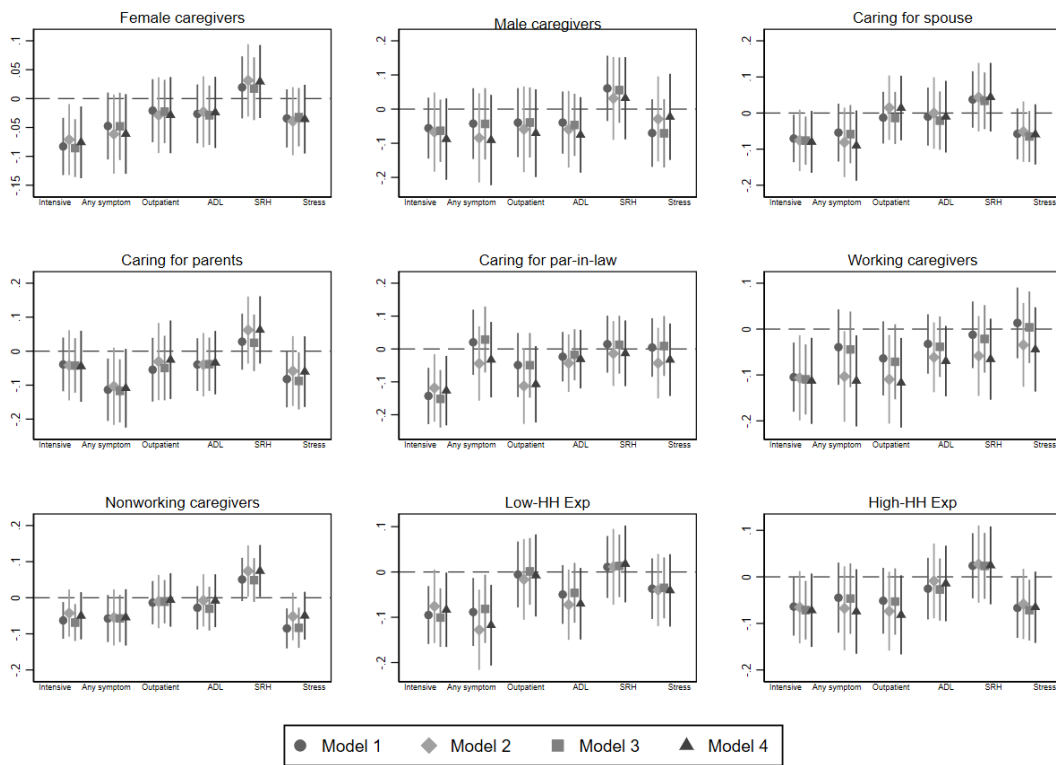


Figure B1. Placebo test: a placebo post period

**Panel A**



**Panel B**



**Figure B2. Placebo test: a placebo treatment status**

### C. Main results across models

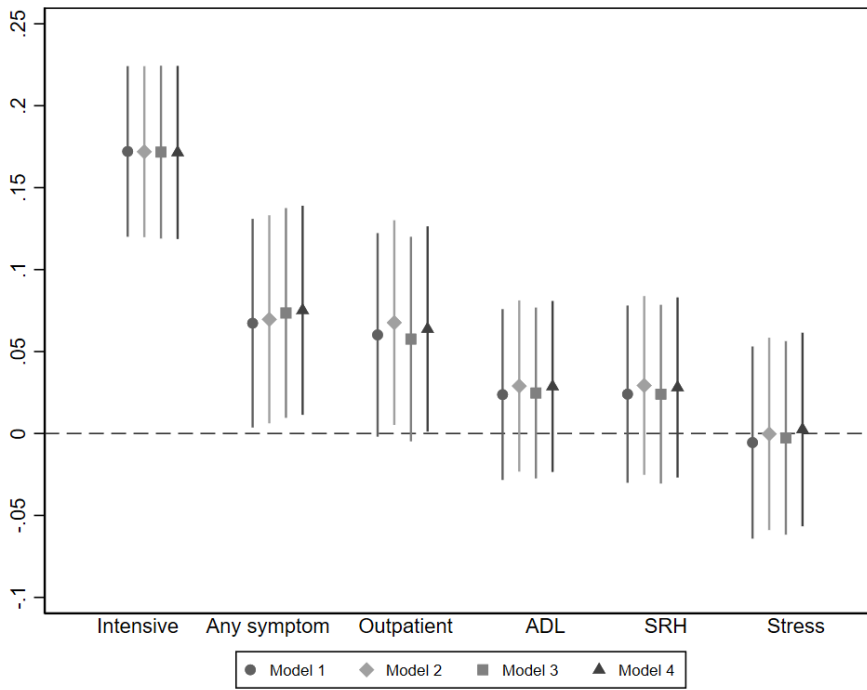


Figure C1. Impact on informal care provision and caregiver well-being across models

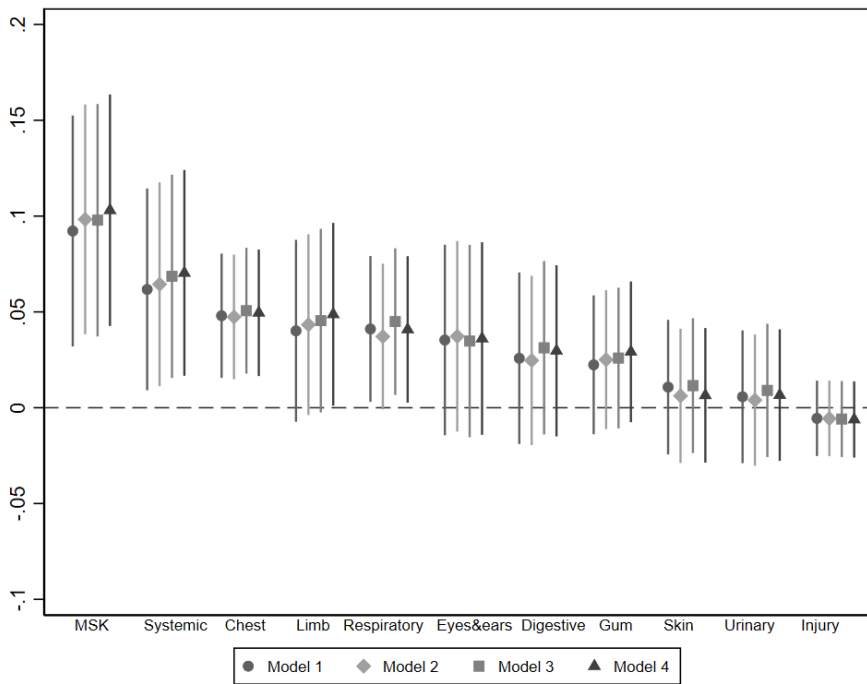
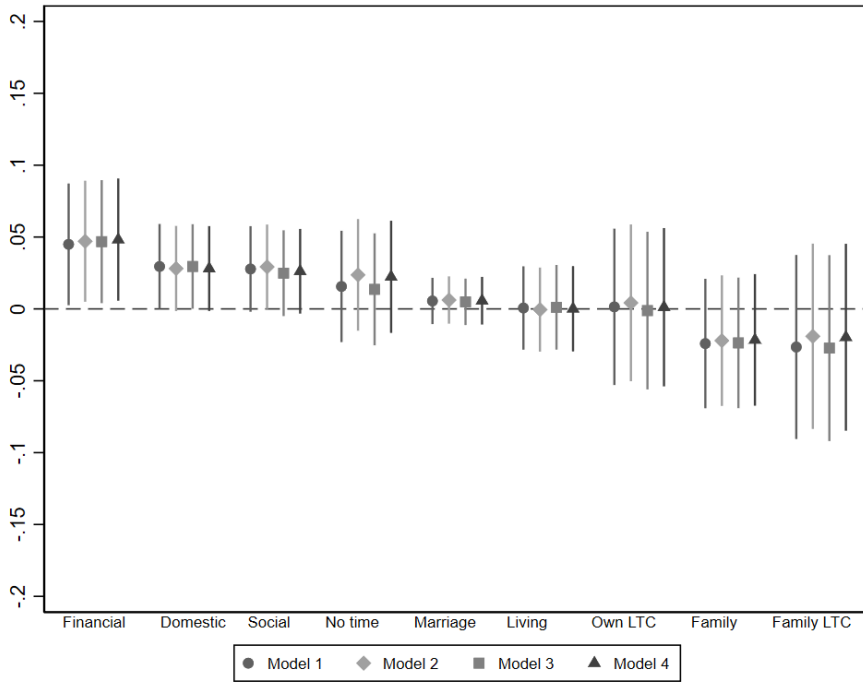


Figure C2. Impact on caregiver well-being across models: specific symptoms



**Figure C3. Impact on caregiver well-being across models: reasons for being stressed**

## D. Results from the aggregated DD-FE Model

**Table D1. Overall impacts of the 2006 reform on informal care provision and well-being of caregivers**

	N	Impact of the Reform	S.E.	95% C.I.	
<b>Panel A: Main results</b>					
Care intensity	8,194	0.172	0.027	[ 0.119	0.224 ]
Any symptom	8,307	0.074	0.033	[ 0.010	0.138 ]
Outpatient visits	8,211	0.058	0.032	[ -0.005	0.120 ]
ADL limitations	7,571	0.025	0.027	[ -0.027	0.077 ]
Self-rated poor health	7,823	-0.003	0.030	[ -0.062	0.056 ]
Being stressed	8,406	0.024	0.028	[ -0.031	0.079 ]
<b>Panel B: Specific symptoms</b>					
Musculoskeletal system	8,307	0.098	0.031	[ 0.037	0.158 ]
Systemic symptoms	8,307	0.069	0.027	[ 0.016	0.122 ]
Chest	8,307	0.051	0.017	[ 0.018	0.083 ]
Limb	8,307	0.045	0.024	[ -0.002	0.093 ]
Respiratory	8,307	0.045	0.020	[ 0.007	0.083 ]
Eyes and ears	8,307	0.035	0.026	[ -0.015	0.085 ]
Digestive system	8,307	0.031	0.023	[ -0.014	0.077 ]
Gum	8,307	0.026	0.019	[ -0.011	0.063 ]
Skin	8,307	0.012	0.018	[ -0.024	0.047 ]
Urinary tract	8,307	0.009	0.018	[ -0.026	0.044 ]
Injury	8,307	-0.006	0.010	[ -0.026	0.014 ]
<b>Panel C: Reasons for being stressed</b>					
Financial strain	7,823	0.047	0.022	[ 0.004	0.090 ]
Domestic work	7,823	0.030	0.015	[ 0.000	0.059 ]
Social networks	7,823	0.025	0.015	[ -0.005	0.055 ]
Having no free time	7,823	0.014	0.020	[ -0.025	0.053 ]
Marriage, love, and sexual life	7,823	0.005	0.008	[ -0.011	0.021 ]
Reason for living	7,823	0.001	0.015	[ -0.028	0.031 ]
Own health and LTC issues	7,823	-0.001	0.028	[ -0.056	0.054 ]
Family relations	7,823	-0.024	0.023	[ -0.069	0.022 ]
Family health and LTC issues	7,823	-0.027	0.033	[ -0.092	0.037 ]

*Notes:* All estimates were derived based on Model 3 of Equation (2), which controlled for the full set of caregiver characteristics and recipients' gender and age, as well as year FE, care level FE, prefecture FE, and prefecture-year trend. N stands for number of observations, S.E. for standard errors that were clustered at the municipal level, and 95% C.I. for confidence intervals at the 95% level.

**Table D2. Multiple testing for the aggregated main results: p-values of the estimates**

	Full	
	Origin	Simes
<b>Panel A: Main results</b>		
Care intensity	0.0000	0.0000
Any symptom	0.0243	0.1055
Outpatient visits	0.0705	0.1833
ADL limitations	0.3532	0.5739
Self-rated poor health	0.3886	0.5901
Being stressed	0.9285	0.9669
<b>Panel B: Specific symptoms</b>		
Musculoskeletal system	0.0016	0.0204
Systemic symptoms	0.0113	0.0735
Chest	0.0025	0.0219
Limb	0.0631	0.1822
Respiratory	0.0213	0.1055
Eyes and ears	0.1742	0.3255
Digestive system	0.1753	0.3255
Gum	0.1660	0.3255
Skin	0.5207	0.6626
Urinary tract	0.6101	0.6897
Injury	0.5607	0.6626
<b>Panel C: Reasons for being stressed</b>		
Financial strain	0.0321	0.1192
Domestic work	0.0491	0.1596
Social networks	0.1028	0.2430
Having no free time	0.4931	0.6626
Marriage, love, and sexual life	0.5521	0.6626
Reason for living	0.9414	0.9669
Own health and LTC issues	0.9669	0.9669
Family relations	0.3072	0.5324
Family health and LTC issues	0.4085	0.5901

*Notes:* The multiple testing is conducted based on Model 3 of Equation (2), which controlled for the full set of caregiver characteristics and recipients' gender and age, as well as year FE, care level FE, prefecture FE, and prefecture-year trend. "Origin" stands for the p-values based on clustered standard errors; "Simes" standards for the p-values further adjusted for multiple-hypotheses testing.

## E. Gender disparities in the impacts of the reform

**Table E1. Multiple Testing for the aggregated DD results by gender: p-values of the estimates**

	Female		Male	
	Origin	Simes	Origin	Simes
<b>Panel A: Main results</b>				
Care intensity	0.0000	0.0000	0.0092	0.2355
Any symptom	0.0724	0.1125	0.4253	0.8241
Outpatient visits	0.0310	0.0995	0.7897	0.9204
Any ADL limitations	0.0523	0.1359	0.2781	0.8035
Self-rated poor health	0.2870	0.3927	0.8769	0.9204
Being stressed	0.3588	0.4665	0.0446	0.3867
<b>Panel B: Specific symptoms</b>				
Musculoskeletal system	0.0075	0.0490	0.1587	0.5895
Systemic symptoms	0.0337	0.0995	0.2754	0.8035
Chest	0.0008	0.0106	0.9204	0.9204
Limb	0.1435	0.2073	0.5071	0.8241
Respiratory	0.0012	0.0108	0.3614	0.8241
Eyes and ears	0.1408	0.2073	0.9001	0.9204
Digestive system	0.1361	0.2073	0.7873	0.9204
Gum	0.1159	0.2073	0.8077	0.9204
Skin	0.0344	0.0995	0.0181	0.2355
Urinary tract	0.1168	0.2073	0.1484	0.5895
Injury	0.4635	0.5627	0.9186	0.9204
<b>Panel C: Reasons for being stressed</b>				
Financial strain	0.0218	0.0995	0.6757	0.9204
Domestic work	0.0330	0.0995	0.8051	0.9204
Social networks	0.1227	0.2073	0.4857	0.8241
Having no free time	0.5287	0.5727	0.6965	0.9204
Marriage, love, and sexual life	0.1067	0.2073	0.3197	0.8241
Reason for living	0.6920	0.6920	0.4565	0.8241
Own health and LTC issues	0.5145	0.5727	0.0800	0.4977
Family relations	0.4761	0.5627	0.4413	0.8241
Family health and LTC issues	0.6668	0.6920	0.0957	0.4977

*Notes:* The multiple testing is conducted based on Model 3 of Equation (2), which controlled for the full set of caregiver characteristics and recipients' gender and age, as well as year FE, care level FE, prefecture FE, and prefecture-year trend. "Origin" stands for the p-values based on clustered standard errors; "Simes" standards for the p-values further adjusted for multiple-hypotheses testing.



## F. Gender Disparities in the impact of the reform across SES

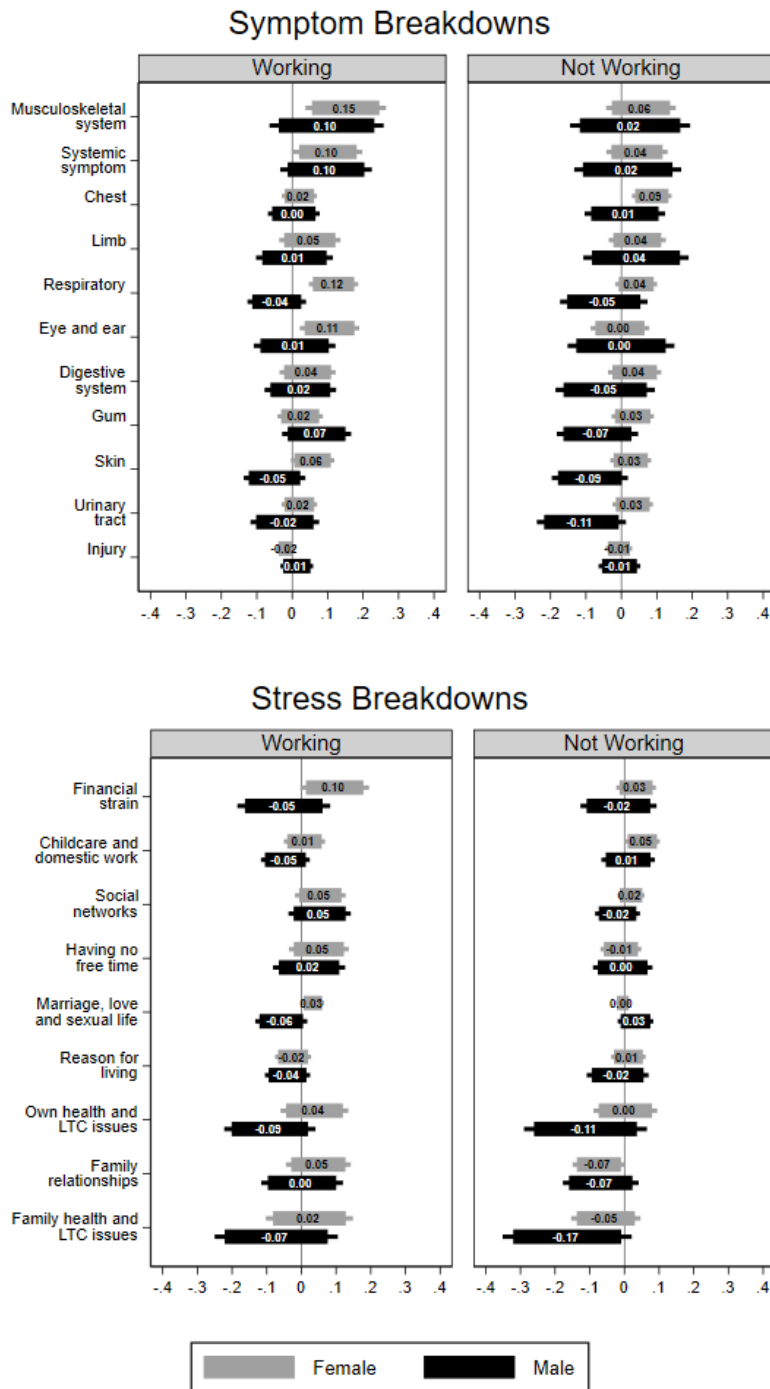
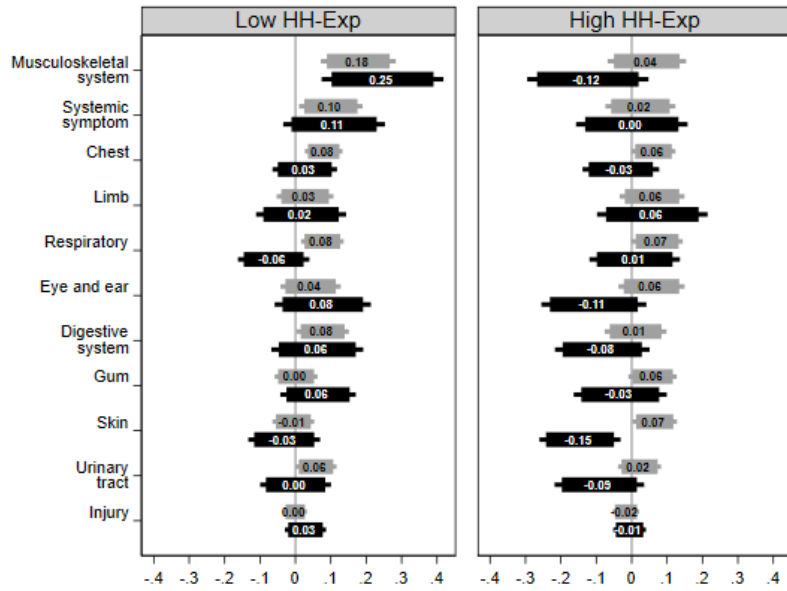


Figure F1. Gender gradients in impact of the 2006 reform: caregivers' working status

### Symptom Breakdowns



### Stress Breakdowns

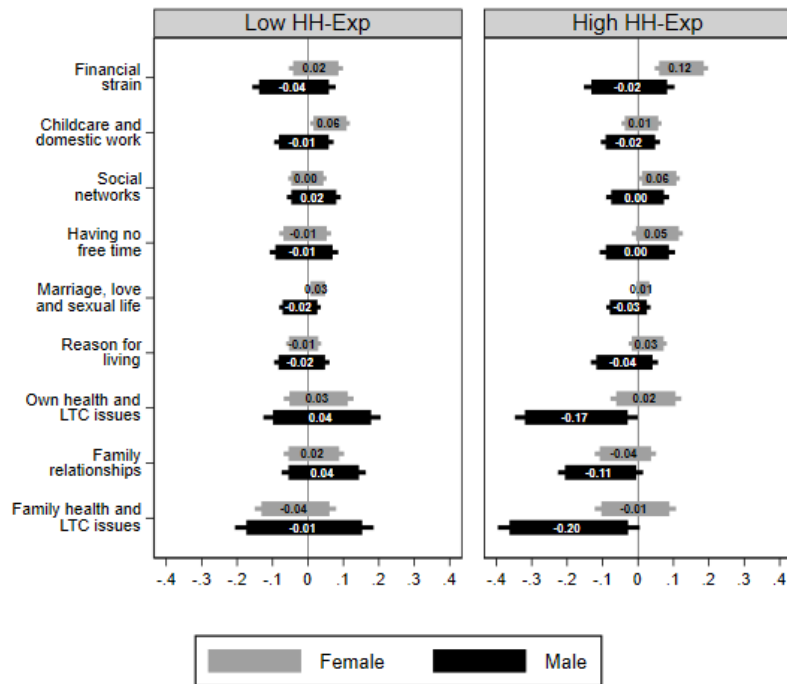
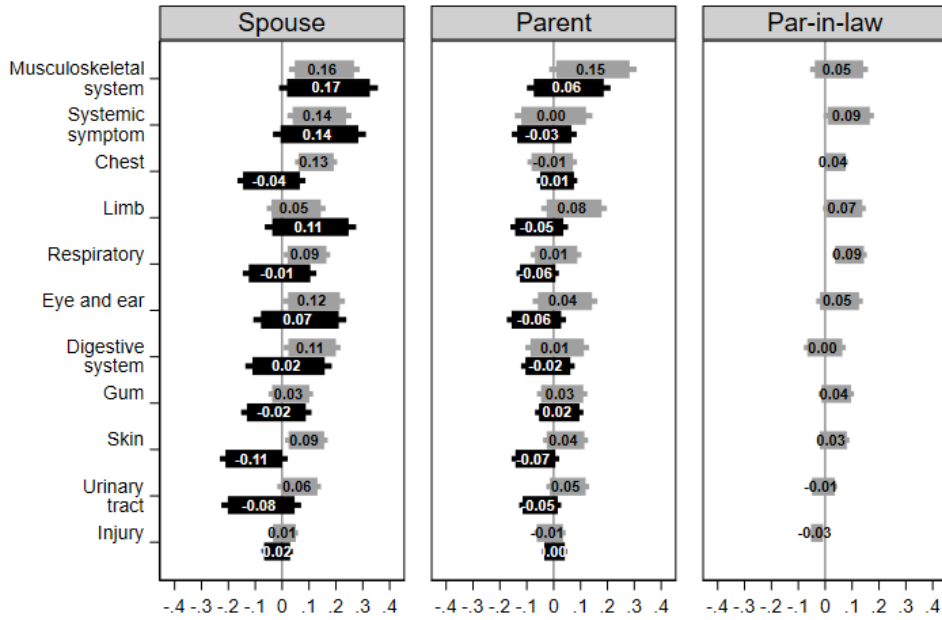


Figure F2. Heterogenous impact on specific symptoms by gender: income level

## Symptom Breakdowns



## Stress Breakdowns

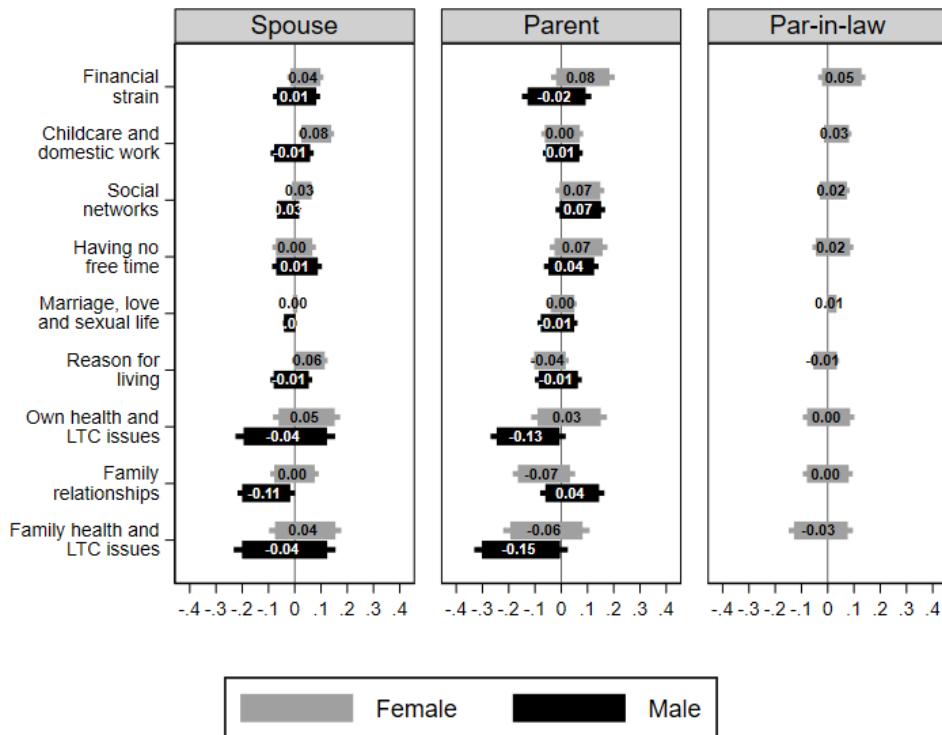
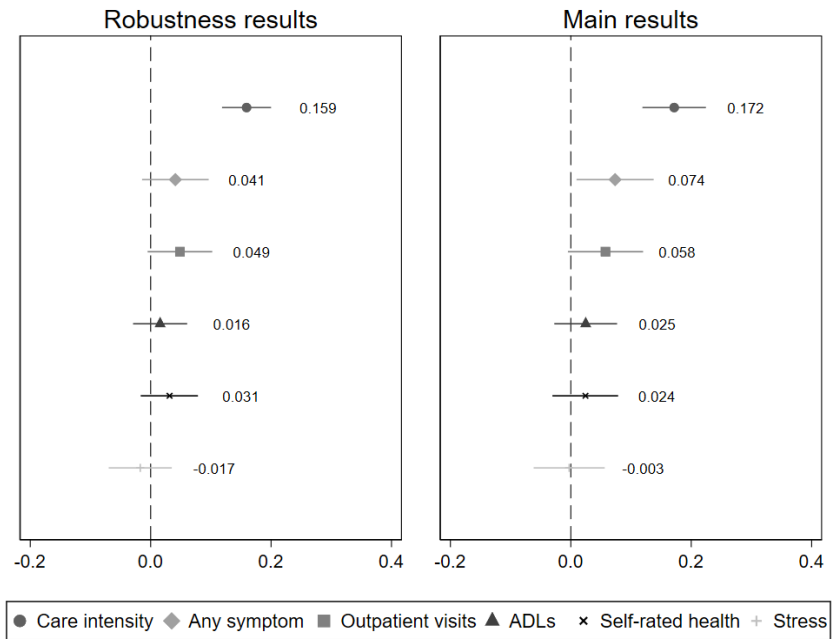


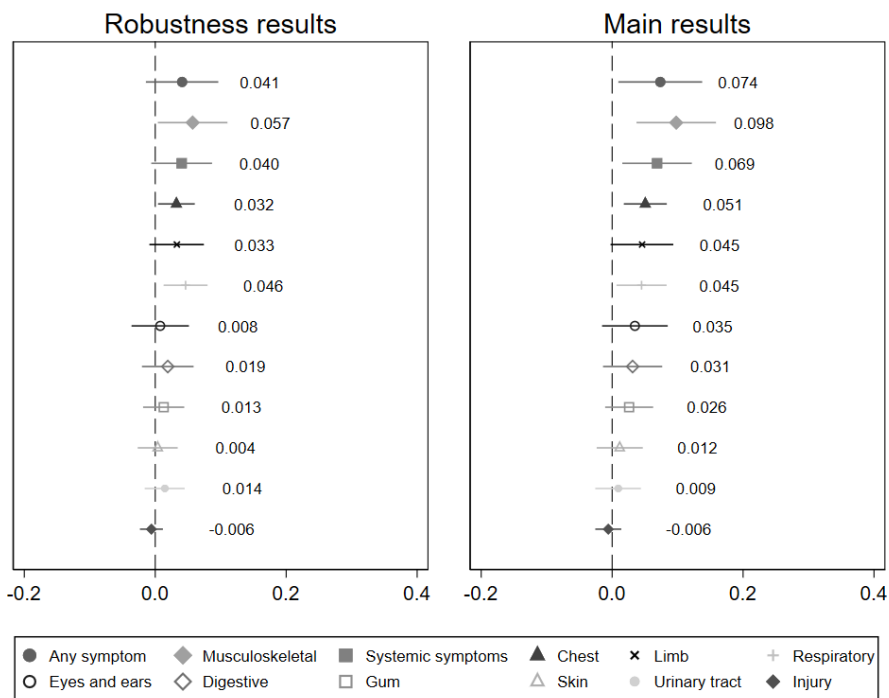
Figure F3. Heterogenous impact on specific symptoms by gender: caregiver-recipient relationship

## G. Robustness Checks

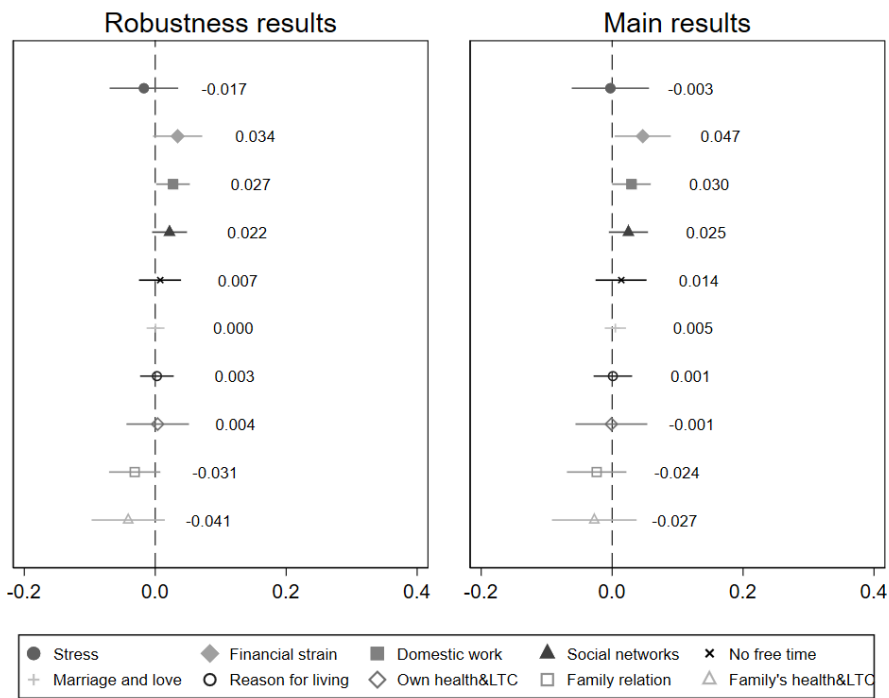


**Figure G1. Robustness checks**

*Notes:* For the robustness results, the markers with 95% confidence intervals represent the estimates of  $\gamma_1$  from Model 3 of Equation (3), which controlled for the full set of caregiver characteristics and recipients' gender and age, as well as year FE, care level FE, prefecture FE, and prefecture-year trend. For the main results, the markers with 95% confidence intervals correspond to the estimates presented in Panel A of Table 3. Standard errors are clustered at the municipal level.



**Figure G2. Robustness check: specific symptom**



**Figure G3. Robustness check: reasons for being stressed**