Spousal retirement and healthcare utilization

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The “Retired Husband Syndrome”

Figure 1.—Retirement for many is filling his day with what he calls *pleasurable* activity.

Figure 3.—“Since his retirement, my husband has taken up residence in my kitchen—you can’t imagine the disarray that can occur.”

Figure 9.—“He has become an alcoholic, and the verbal abuse I encounter leaves me depressed and ill.”

Anecdotal evidence from a medical doctor (Charles Johnson MD, 1984)

- Spillover effects of retirement:
  - home production
  - leisure activities
  - marital stability
  - joint retirement
  - **health and health behavior**
  - **availability of a caretaker**

This paper

- We focus on
  - health care utilization of husbands and wives
  - spillover on health demand, i.e. preventive health behavior
  - availability of a caregiver $\Rightarrow$ need for hospitalization and care
- We exploit exogenous variation in retirement age due to pension reforms in 2000 and 2003 in Austria
  - gradual increase in eligibility age for early retirement for different (quarter-of-) birth cohorts
- We use comprehensive administrative health care data from Austria
  - outpatient sector: doctor visits, drug prescriptions, expenditure for doctors and medication
  - participation in screening programs
  - inpatient sector: hospitalization, length of hospital stay, expenditure

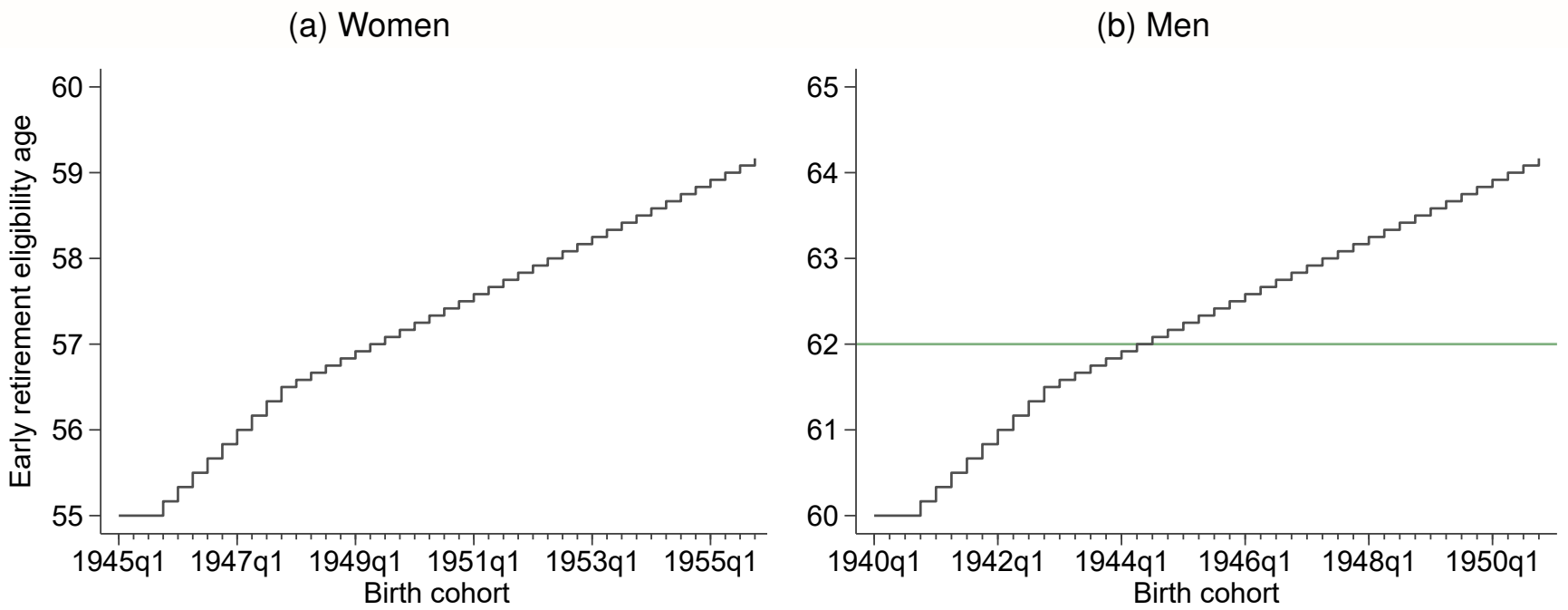
Health care System

- Bismarckian-type health care system
- Universal access to high quality medical services
- Compulsory insurance depending on type and location of employer (*Gebietskrankenkassen*)
- Health insurance funds cover the expenses for outpatient treatment and medication. Inpatient expenses co-financed by regional governments (taxes) and health insurance funds (insurance contributions)
- Unlimited access to health care services for individuals after retirement

Pension System

- Public pension system covers all workers
- Early retirement pension (long periods of insurance), old-age pension, disability pension
- Statutory retirement age was 65 (60) for men (women)
- Average retirement age was 61.6 (60.9) for men (women) in 2022
- Low LFP rate of older workers (77.4% for age group 55-59 in 2022)
- High gross pension replacement rate of 74.1% in 2022 (OECD: 50.7%)

Early retirement eligibility age



- Corridor pension caps early retirement at age 62 for men
- Long-term insured (men: ≥ 45, women: ≥ 40) and heavy-labor workers exempted
- Significant employment effects (Staubli and Zweimüller (2013), Manole and Weber (2016))

Data

- Austrian Social Security Database (ASSD)
  - workers' employment and earnings histories
  - basic socio-economic characteristics
  - retirement start and pathways into retirement
- Health care utilization data (Upper Austrian Health Insurance Fund)
  - outpatient sector: expenditure for medical attendance (GPs, medical specialists) and medical drugs (ATC), participation in screening exams
  - inpatient sector: hospital expenditure and hospital days (ICD-10)
- Family link:
  - marriages & divorces (Austrian Marriage Register)
  - payslip data (Austrian Ministry of Finance)
  - co-insurance data (ASSD)

Sample

- Husband sample $\Rightarrow$ all husbands with wives born 1945-1955
- Wife sample $\Rightarrow$ all wives with husbands born 1940-1950
- Only private sector workers
- Exclude individuals with different partners and couples with age difference > 15 years
- Spouse must be eligible for retirement ($\geq$ 180 insurance months)
- Exclude individual if spouse is subject to special retirement schemes, i.e. heavy labor work and long-term insured (at 55/60)
- Health expenditure observed from 1998 (2005) to 2017

Summary statistics :: quarter before cutoff

	Husband sample		Wife sample	
	Mean	Sd	Mean	Sd
Individual outcomes				
Drug prescription (I)	0.66	0.47	0.66	0.48
Drug prescriptions (n)	3.98	6.06	3.70	5.86
Drug expenditure (Euro)	100.19	388.93	85.48	327.91
Doctor visits (I)	0.78	0.41	0.79	0.41
Doctor visits (n)	3.85	4.58	4.07	4.88
Doctor expenditure (Euro)	79.20	126.85	82.96	124.91
Basic screening (I)	0.06	0.23	0.05	0.22
Specific screening	0.13	0.33	0.15	0.36
Hospitalization (I)	0.09	0.28	0.06	0.24
Length of stay (days)	0.67	3.35	0.42	2.52
Inpatient expenditure (Euro)	436.99	2523.05	249.48	1826.66
Individual characteristics				
Age	59.83	4.90	61.40	0.64
Early retirement age (ERA)	61.79	0.56	57.27	1.56
Eligible	0.33	0.47	0.51	0.50
Retired	0.52	0.50	0.70	0.46
Retired (disability)	0.15	0.35	0.29	0.45
Employed	0.42	0.49	0.19	0.39
Unemployed	0.02	0.15	0.03	0.17
Out of labor force	0.03	0.17	0.08	0.27
Spouse characteristics				
Age	57.45	1.13	57.23	4.71
Early retirement age (ERA)	57.62	1.12	61.62	0.65
Retired	0.26	0.44	0.33	0.47
Retired (disability)	0.07	0.26	0.05	0.22
Employed	0.43	0.49	0.34	0.47
Unemployed	0.06	0.23	0.03	0.16
Out of labor force	0.25	0.43	0.31	0.46
N	16,434 (13,322)		12,211 (8,880)	

Identification strategy

- Age-based discontinuity design
- Individual-specific early retirement age based on birth cohort with partial compliance $\Rightarrow$ fuzzy RD design
- Running variable $\Rightarrow$ age centered at early retirement age (era_i):
  - wife: 55-60
  - husband: 60-62

$$agec_{iq} = age_{iq} - era_i$$

- Eligibility for early retirement defined as

$$elig_{iq} = \mathbb{1}\{age_{iq} \geq era_i\}$$

Identification strategy

Second stage

$$Y_{iq} = \delta^S R^S_{iq} + \sum_{p=1}^{P} \gamma^S_p (agec^S_{iq})^p + \beta^S_p elig^S_{iq} (agec^S_{iq})^p + \sum_c \alpha_c \mathbb{1}\{agec_{iq} = c\} + \sum_{r=1}^{R} \kappa_r (age_{iq})^r + t_q + \epsilon_{iq}$$

- Y_{iq} ... outcome of reference individual i in quarter q
- R^S_{iq} ... indicates whether the spouse of i is retired in quarter q
- δ^S measures the effect of spousal retirement on the outcome of i
- $(agec^S_{iq})^p$ ... p^{th}-order polynomial function of spousal centered age (quadratic)
- $\sum_c \alpha_c \mathbb{1}\{agec_{iq} = c\}$ ... individual centered age fixed effects
- $(age_{iq})^r$ ... r^{th}-order polynomial function of individual age (quadratic)
- t_q ... year-quarter fixed effects

Identification strategy

First stage

- Retirement of spouse is endogenous $\Rightarrow$ spousal eligibility as instrument

$$R_{iq}^S = \theta^S elig_{iq}^S + \sum_{p=1}^{P} \tau_p^S (agec_{iq}^S)^p + \lambda_p^S elig_{iq}^S (agec_{iq}^S)^p + \sum_c \rho_c \mathbb{1}\{agec_{iq} = c\} + \sum_{r=1}^{R} \phi_r (age_{iq})^r + t_q + \nu_{iq}$$

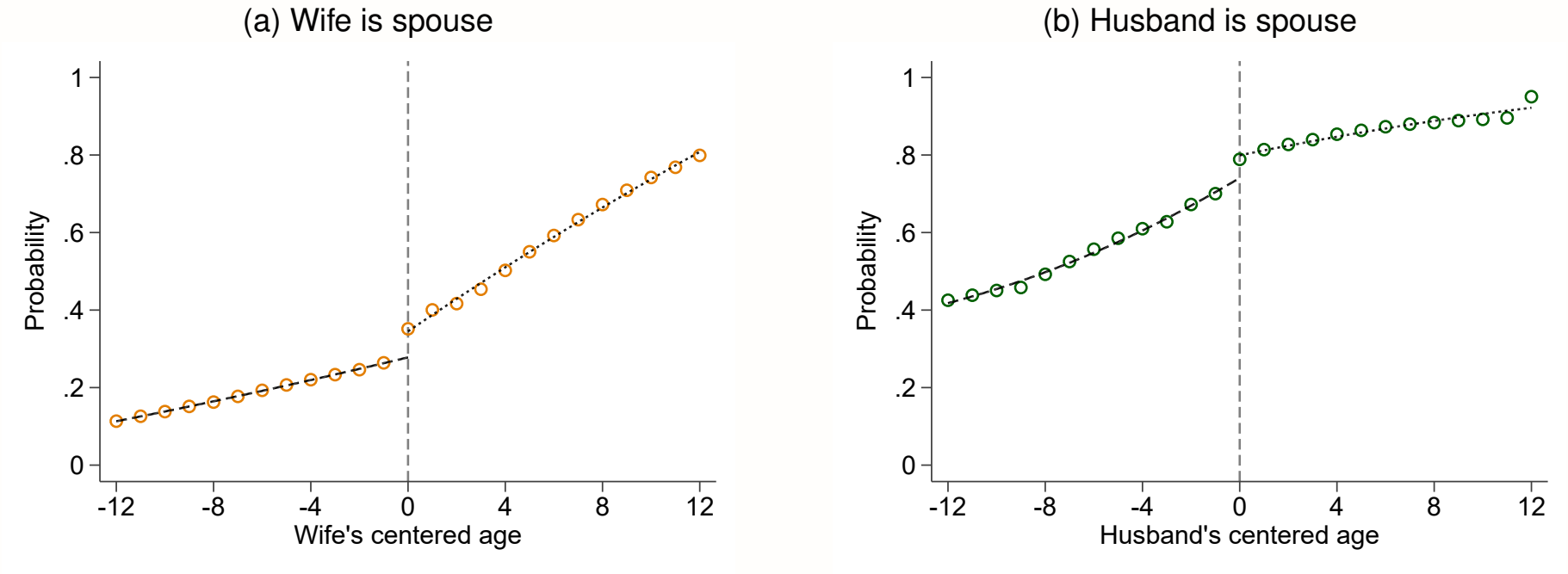
  - $elig_{iq}^S = \mathbb{1}\{age_{iq} \geq era_i\}$ indicates spousal eligibility for early retirement
  - θ^S measures the increase in the retirement probability at the early retirement cutoff

Identification strategy

Assumptions

- First stage $\Rightarrow$ eligibility affects early retirement
- Individuals cannot manipulate eligibility status around the cutoff
  - retrospective birth-cohort rule
- Balancing tests not possible
- Independence of individual and spousal retirement
  - control for individual eligibility (non-parametrically)
  - instrument for spousal and individual retirement

Spousal retirement :: first stage



- Wives' retirement probability increases by 6.8 pp
- Husbands' retirement probability increases by 5.7 pp

▸ first stage ▸ robustness ▸ bandwidth

Husbands' outpatient outcomes

	Drug prescriptions	Doctor visits	Health screening		
			Basic	PSA test	
(a) Any					
Wife retired	0.041	0.037	0.082***	0.077*	0.094**
	(0.047)	(0.046)	(0.031)	(0.041)	(0.045)
AR test (p)	0.373	0.418	0.008	0.061	0.035
Mean outcome	0.655	0.778	0.056	0.122	0.143
SD outcome	0.475	0.415	0.230	0.327	0.350
(b) Frequency					
Wife retired	−0.513	0.215			
	(0.424)	(0.523)			
AR test (p)	0.226	0.681			
Mean outcome	3.971	3.795			
SD outcome	6.145	4.560			
(c) Expenditure					
Wife retired	5.122	1.360			
	(61.073)	(15.610)			
AR test (p)	0.933	0.931			
Mean outcome	108.122	78.736			
SD outcome	630.489	125.817			
N	396,592	396,592	396,592	396,592	396,592
N couples	19,400	19,400	19,400	19,400	19,400

▸ graphs ▸ age FE ▸ bandwidth ▸ joint

Husbands' inpatient outcomes

				Cardiovascular diseases (ICD-I)		
	Any disease	**Mental**	**Physical**	All	Heart attack	Stroke
(a) Hospitalization						
Wife retired	−0.092*	−0.023**	−0.076	−0.033	−0.007	−0.011*
	(0.054)	(0.011)	(0.053)	(0.025)	(0.010)	(0.007)
AR test (p)	0.086	0.036	0.149	0.196	0.473	0.084
Mean outcome	0.086	0.002	0.084	0.016	0.002	0.001
SD outcome	0.280	0.048	0.277	0.126	0.049	0.031
(b) Length of stay						
Wife retired	−1.836***	−0.451**	−1.385**	−0.584*	−0.039	−0.257**
	(0.679)	(0.223)	(0.635)	(0.300)	(0.065)	(0.131)
AR test (p)	0.006	0.041	0.028	0.050	0.555	0.048
Mean outcome	0.660	0.036	0.623	0.120	0.013	0.012
SD outcome	3.421	1.030	3.248	1.371	0.344	0.492
(c) Expenditure						
Wife retired	−1113.148**	−144.937**	−968.211**	−378.997	−21.540	−126.910
	(499.433)	(67.420)	(492.758)	(294.401)	(96.672)	(92.102)
AR test (p)	0.025	0.030	0.048	0.197	0.824	0.167
Mean outcome	431.997	11.923	420.074	105.836	15.052	8.333
SD outcome	2757.308	323.610	2734.326	1444.700	452.680	406.278
N	319,261	319,261	319,261	319,261	319,261	319,261
N couples	17,387	17,387	17,387	17,387	17,387	17,387

▸ graphs ▸ age FE ▸ bandwidth ▸ joint

Wives' outpatient outcomes

	Drug prescriptions	Doctor visits	Health screening		
			Basic	Gyn/mam/col	
(a) Any					
Husb retired	−0.042	−0.002	0.013	−0.038	−0.004
	(0.067)	(0.062)	(0.042)	(0.065)	(0.071)
AR test (p)	0.529	0.968	0.750	0.561	0.952
Mean outcome	0.652	0.789	0.051	0.153	0.188
SD outcome	0.476	0.408	0.221	0.360	0.391
(b) Frequency					
Husb retired	0.396	−0.604			
	(0.580)	(0.758)			
AR test (p)	0.494	0.425			
Mean outcome	3.683	3.987			
SD outcome	5.917	4.753			
(c) Expenditure					
Husb retired	−35.678	−12.402			
	(36.813)	(20.619)			
AR test (p)	0.331	0.547			
Mean outcome	84.869	83.022			
SD outcome	368.931	135.148			
N	299,795	299,795	299,795	299,795	299,795
N couples	15,088	15,088	15,088	15,088	15,088

▸ graphs ▸ age FE ▸ bandwidth ▸ joint

Wives' inpatient outcomes

				Cardiovascular diseases (ICD-I)		
	Any disease	**Mental**	**Physical**	All	Heart attack	Stroke
(a) Hospitalization						
Husb retired	−0.186*	−0.021	−0.172	−0.063	−0.008	−0.009
	(0.111)	(0.025)	(0.108)	(0.040)	(0.013)	(0.008)
AR test (p)	0.086	0.406	0.106	0.107	0.520	0.245
Mean outcome	0.065	0.003	0.062	0.008	0.001	0.000
SD outcome	0.246	0.055	0.242	0.089	0.027	0.018
(b) Length of stay						
Husb retired	−0.567	−0.407	−0.160	−0.575	−0.061	−0.197
	(1.228)	(0.590)	(1.044)	(0.378)	(0.065)	(0.154)
AR test (p)	0.644	0.489	0.878	0.119	0.347	0.195
Mean outcome	0.458	0.048	0.410	0.053	0.004	0.004
SD outcome	2.703	1.204	2.413	0.887	0.185	0.278
(c) Expenditure						
Husb retired	−970.991	−107.314	−863.676	−597.188*	−38.324	−26.510
	(801.260)	(172.658)	(760.362)	(347.144)	(66.552)	(112.009)
AR test (p)	0.220	0.533	0.251	0.076	0.563	0.813
Mean outcome	267.734	15.408	252.325	37.157	3.533	2.666
SD outcome	1772.314	356.790	1734.420	876.561	251.793	198.317
N	217,928	217,928	217,928	217,928	217,928	217,928
N couples	12,643	12,643	12,643	12,643	12,643	12,643

▸ graphs ▸ bandwidth ▸ joint

Summary

- We find significant spillover effects of wives' retirement on husbands:
  - increased preventive health behavior, i.e., screening participation
  - shorter (and fewer) hospitalizations
- Compliers are more likely wives ▸
  - who were employed (in the labor force) at age 50
  - whose husband is in disability retirement
- Interpretation:
  - wives take care of their husbands' health (behavior)
  - wives act as caregivers (Fischer and Müller (2020))
  - reduces length of hospital stays and prevents hospitalizations
- No evidence for a change in health status (drug prescriptions)
- The effects of husbands' retirement on wives outcomes are not significant
- Long-run changes in health (behavior) uncertain $\Rightarrow$ other research design, (e.g., difference-in-differences, cf. Frimmel and Pruckner (2020))

« Appendix »

First stage

return

The effect of spousal eligibility on spousal retirement

	A. Husband sample — wife's retirement		B. Wife sample — husband's retirement	
Sample	full	restricted	full	restricted
Wife eligible	0.068***	0.055***		
	(0.003)	(0.003)		
Husb eligible			0.057***	0.030***
			(0.003)	(0.004)
Mean outcome	0.373	0.418	0.702	0.702
N	396,592	319,261	299,795	217,928
N couples	19,400	17,387	15,088	12,643

Notes: Each column shows the results of a separate linear regression with uniform weights, a bandwidth of 12 quarters, and quadratic trends in the spouse's centered age on either side of the discontinuity. Control variables include year-quarter fixed effects, spouse centered age (in quarters) fixed effects and individual and spouse quadratic age effects. The full sample includes all quarters in the period 1998-2017; the restricted sample includes all quarters in the period 2005-2017. Robust standard errors clustered at the individual level are shown in parenthesis. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent significance level based on Anderson-Rubin test.

robustness

First stage :: robustness

return

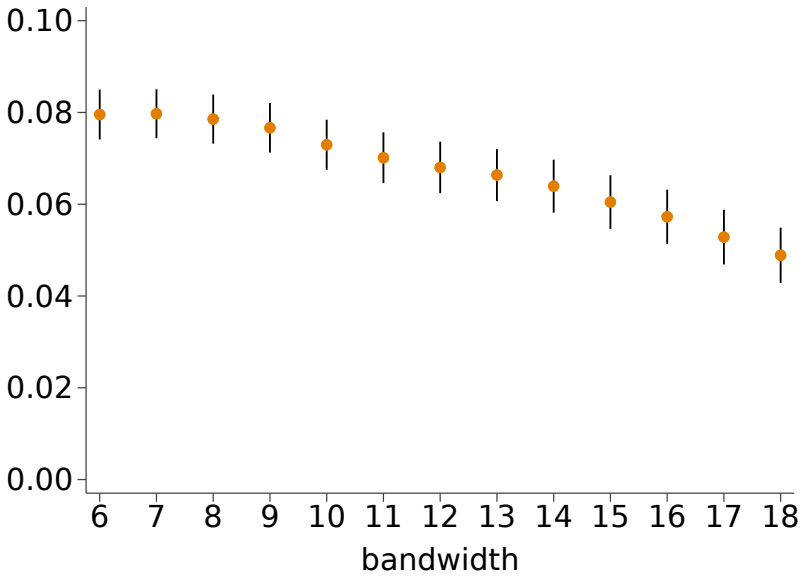
	A. Husband sample — wife's retirement					
	full sample		+ triangular weights		restricted sample	
Wife eligible	0.068***	0.096***	0.073***	0.089***	0.055***	0.088***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
H centered age FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
H quadratic age	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
W age FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Mean outcome	0.373	0.373	0.360	0.360	0.418	0.418
F-stat	291.0	282.3	239.9	246.6	295.5	275.9
N	396,592	396,592	396,592	396,592	319,261	319,261
N couples	19,400	19,400	19,400	19,400	17,387	17,387

	B. Wife sample — husband's retirement					
	full sample		+ triangular weights		restricted sample	
Husb eligible	0.057***	0.087***	0.057***	0.084***	0.030***	0.040
	(0.003)	(0.005)	(0.003)	(0.004)	(0.004)	(0.030)
W centered age FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
W quadratic age	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
H age FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Mean outcome	0.702	0.702	0.722	0.722	0.702	0.702
F-stat	67.8	65.1	58.2	61.6	64.5	62.5
N	299,795	299,795	299,795	299,795	217,928	217,928
N couples	15,088	15,088	15,088	15,088	12,643	12,643

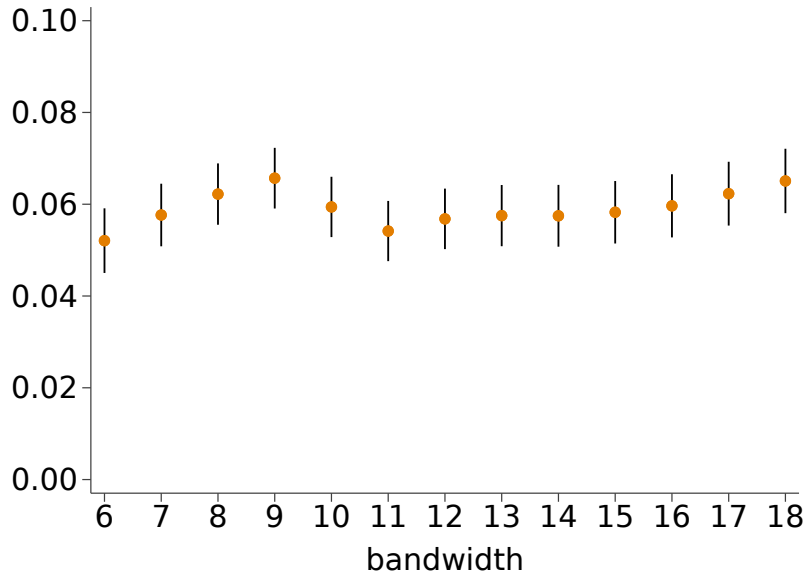
First stage :: bandwidth

return

(a) Husband sample



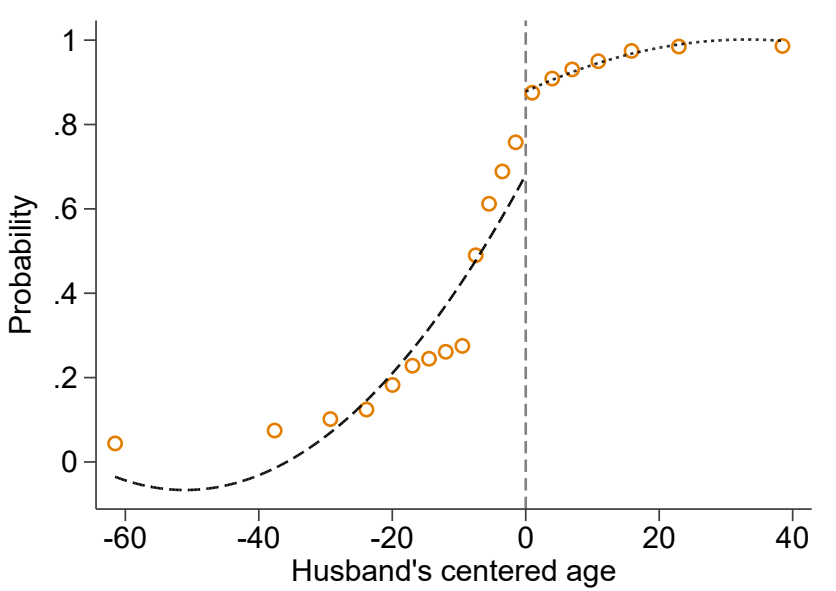
(b) Wife sample



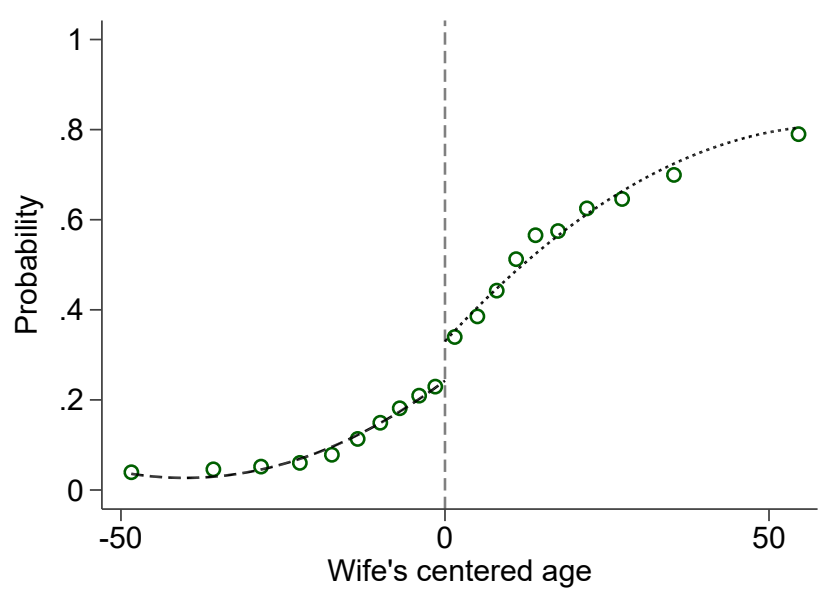
First stage :: individual retirement

return

(a) Husband is reference individual



(b) Wife is reference individual



First stage :: joint retirement

return

	A. Husband sample — Retirement		B. Wife sample — Retirement	
	Wife	Husband	Wife	Husband
Wife eligible	0.068***	0.000	0.061***	0.001
	(0.003)	(0.002)	(0.008)	(0.008)
Husb eligible	0.025***	0.166***	0.000	0.057***
	(0.006)	(0.005)	(0.002)	(0.003)
Mean outcome	0.373	0.528	0.336	0.702
N	396,592	396,592	299,795	299,795
N couples	19,400	19,400	15,088	15,088

Notes: Each column shows the results of a separate linear regression with uniform weights, a bandwidth of 12 quarters, and quadratic trends in individual's and spouse's centered age on either side of the discontinuity. Control variables include year-quarter fixed effects and individual and spouse quadratic age effects. The sample includes all quarters in the period 1998-2017 (full sample). Robust standard errors clustered at the individual level are shown in parenthesis. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent significance level.

Individual retirement

return

	A. Husband sample — husband's retirement		B. Wife sample — wife's retirement	
Sample	full	restricted	full	restricted
Wife retired	0.008	−0.001		
	(0.026)	(0.039)		
Husb retired			0.007	−0.013
			(0.034)	(0.088)
AR test (p)	0.763	0.979	0.830	0.879
Mean outcome	0.528	0.560	0.336	0.371
N	396,592	319,261	299,795	217,928
N couples	19,400	17,387	15,088	12,643

Notes: Each column shows the results of a separate linear regression with uniform weights, a bandwidth of 12 quarters, and quadratic trends in the spouse's centered age on either side of the discontinuity. Spousal retirement is instrumented by spousal eligibility for early retirement. Control variables include year-quarter fixed effects, spouse centered age (in quarters) fixed effects and individual and spouse quadratic age effects. The full sample includes all quarters in the period 1998-2017; the restricted sample includes all quarters in the period 2005-2017. Robust standard errors clustered at the individual level are shown in parenthesis. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent significance level based on Anderson-Rubin test.

robustness

Individual retirement :: robustness

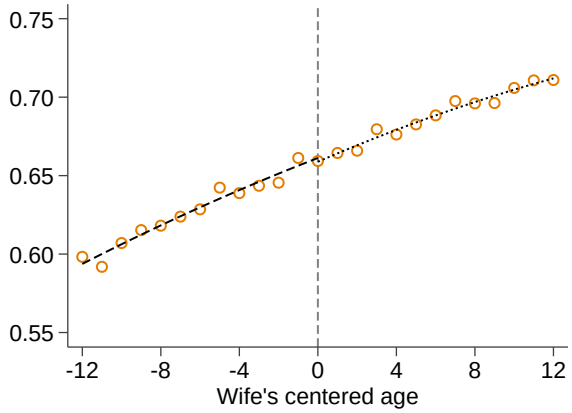
return

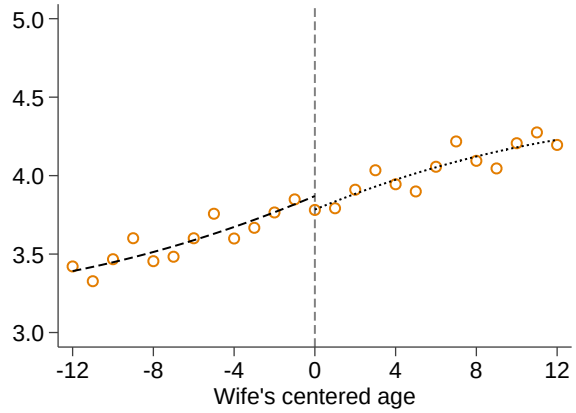
	A. Husband sample — husband's retirement					
	full sample		+ triangular weights		restricted sample	
Wife retired	0.008	0.004	0.003	−0.000	−0.001	0.004
	(0.026)	(0.019)	(0.022)	(0.019)	(0.039)	(0.026)
H centered age FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
H quadratic age	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
W age FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
AR test (p)	0.763	0.826	0.885	1.000	0.979	0.877
Mean outcome	0.528	0.528	0.534	0.534	0.560	0.560
N	396,592	396,592	396,592	396,592	319,261	319,261
N couples	19,400	19,400	19,400	19,400	17,387	17,387

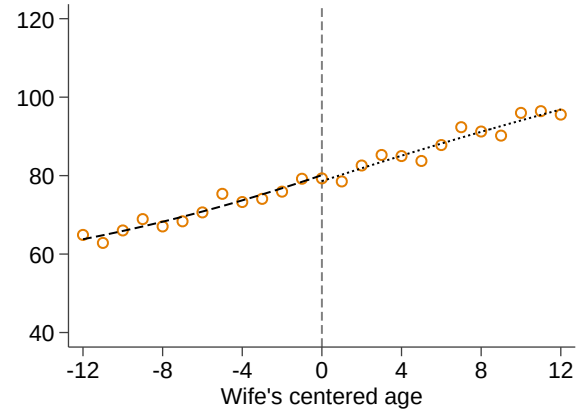
	B. Wife sample — wife's retirement					
	full sample		+ triangular weights		restricted sample	
Husb retired	0.007	0.013	−0.006	−0.014	−0.013	−0.204
	(0.034)	(0.030)	(0.031)	(0.026)	(0.088)	(0.578)
W centered age FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
W quadratic age	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
H age FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
AR test (p)	0.830	0.675	0.855	0.590	0.879	0.713
Mean outcome	0.336	0.336	0.336	0.336	0.371	0.371
N	299,795	299,795	299,795	299,795	217,928	217,928
N couples	15,088	15,088	15,088	15,088	12,643	12,643

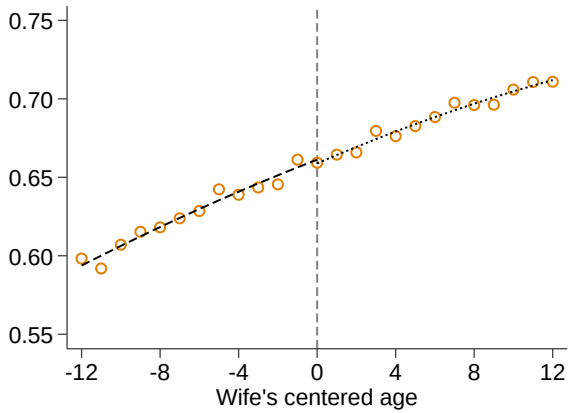
Husbands' outpatient outcomes :: reduced form

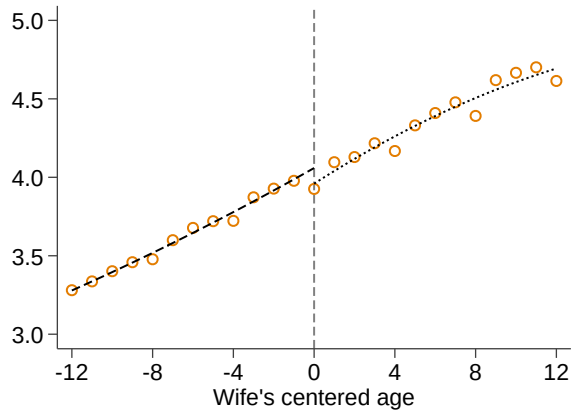
return

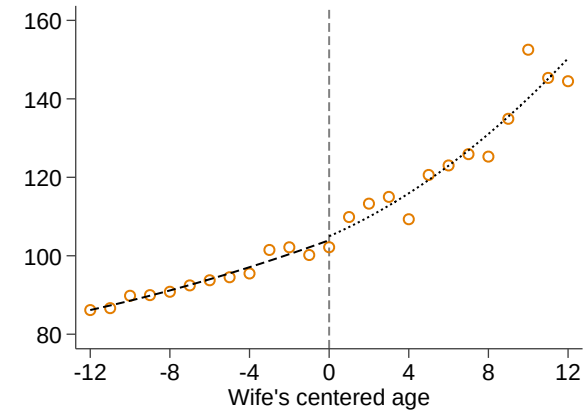


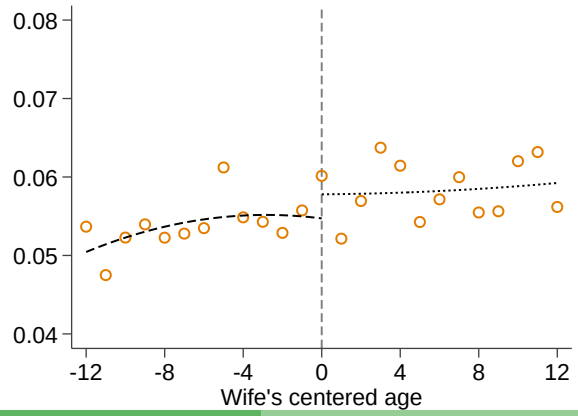


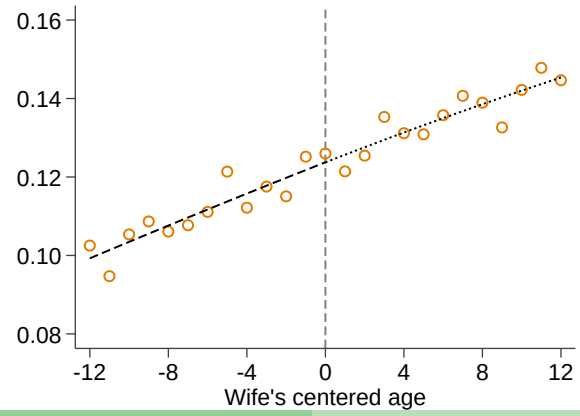






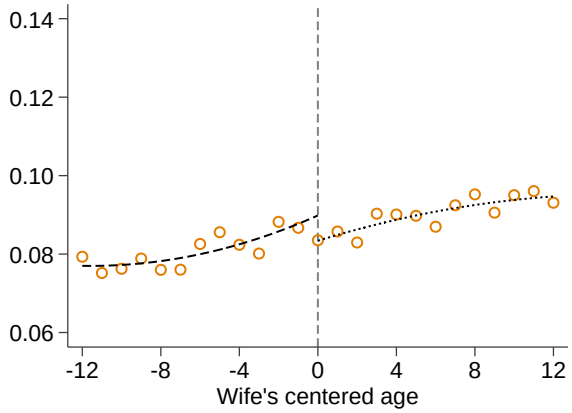


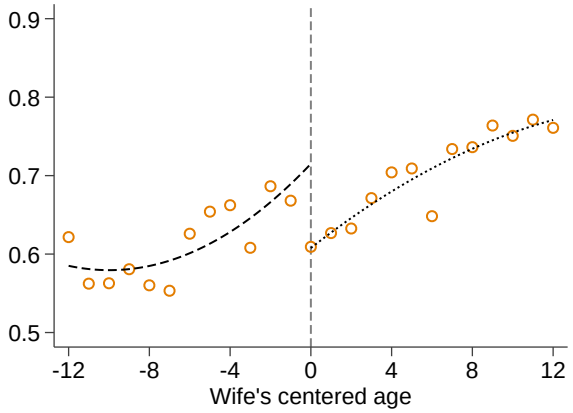


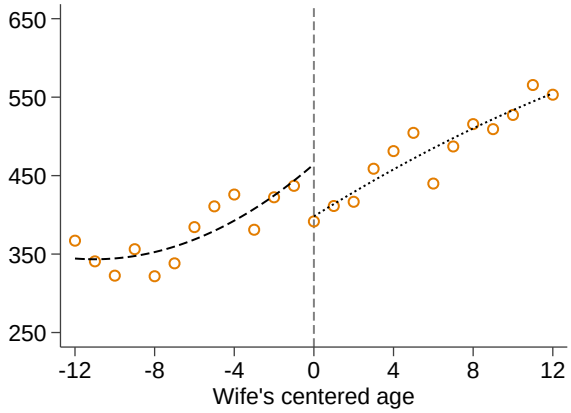


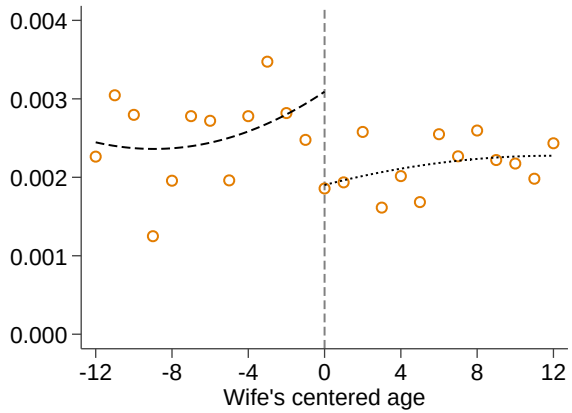
Husbands' inpatient outcomes :: reduced form

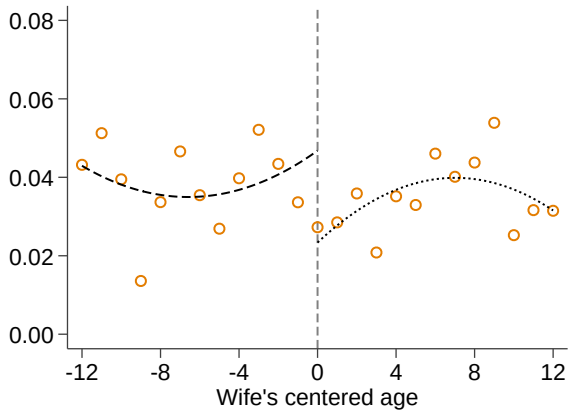
return

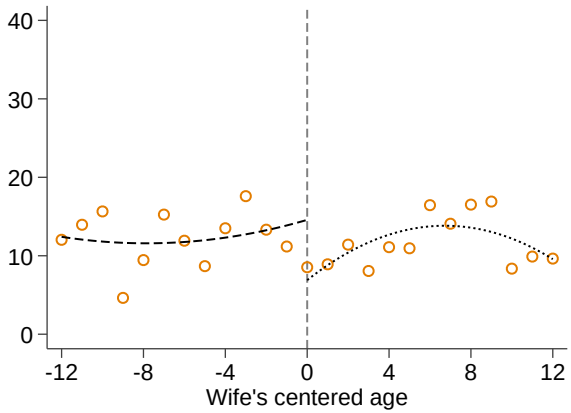


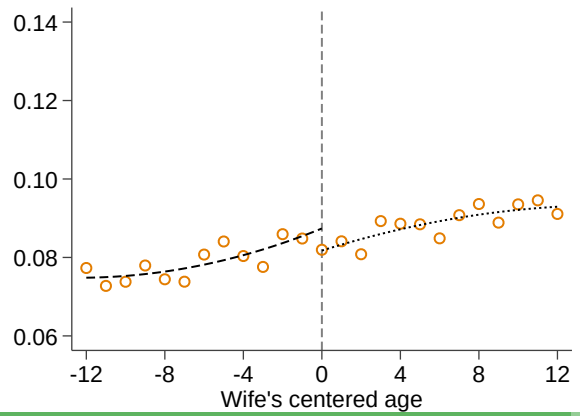


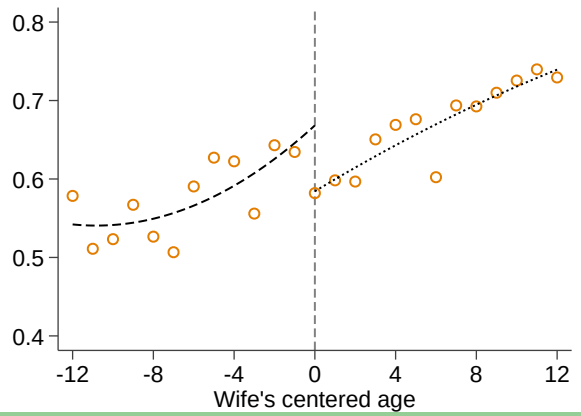


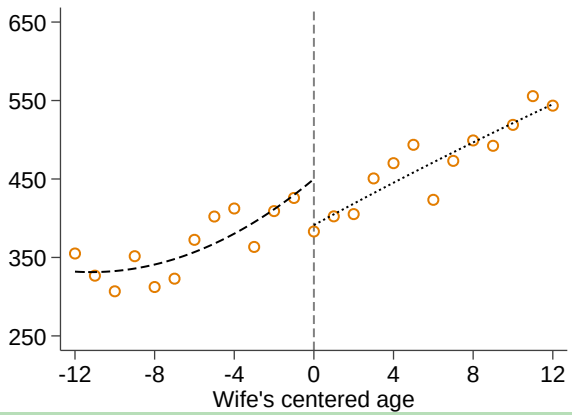






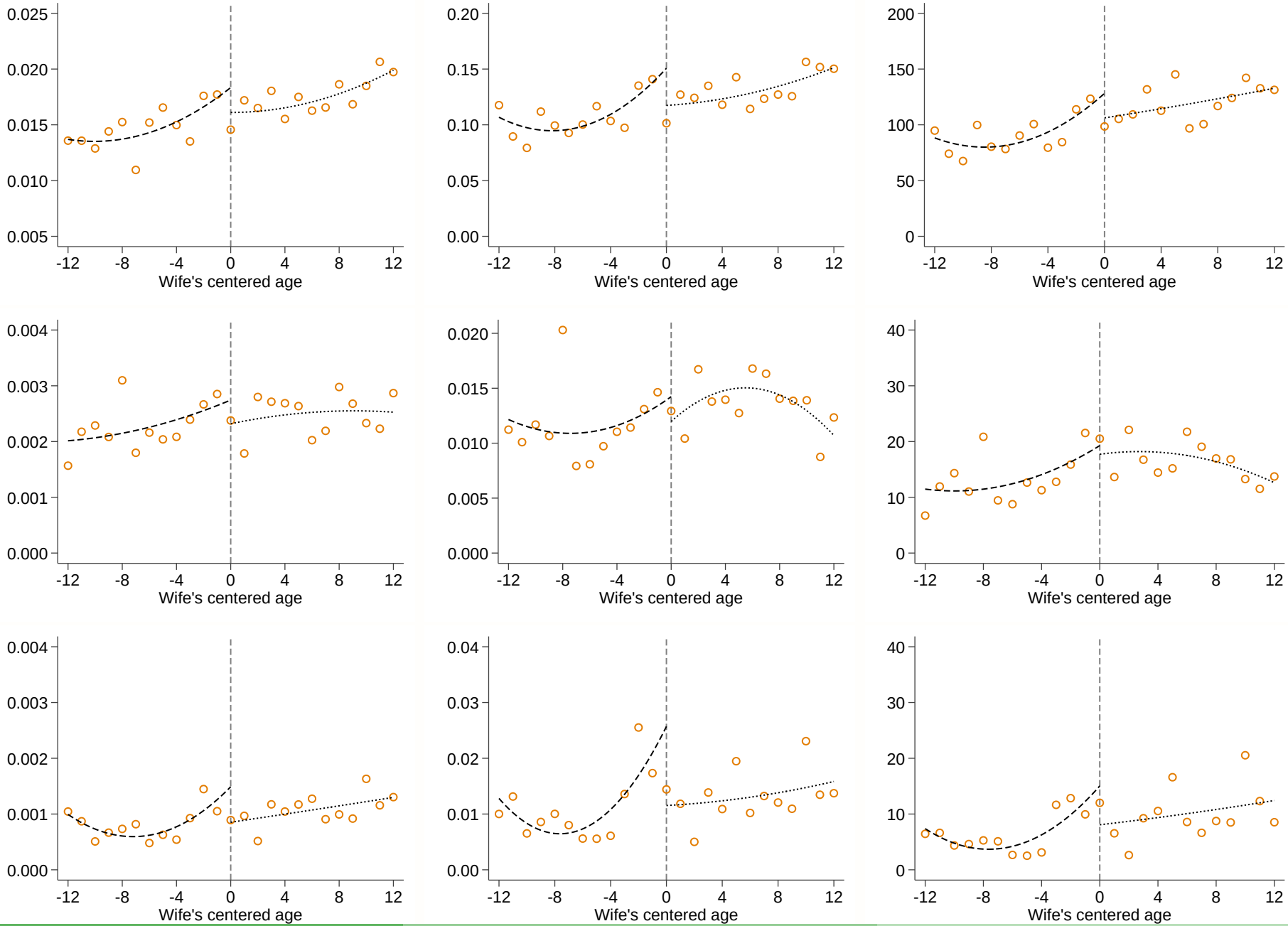






Husbands' inpatient outcomes :: reduced form

return



Husbands' outpatient outcomes :: age FE

return

	Drug prescriptions	Doctor visits	Health screening		
			Basic	PSA test	
(a) Any					
Wife retired	0.031	0.024	0.062***	0.059**	
	(0.034)	(0.034)	(0.022)	(0.030)	
AR test (p)	0.366	0.468	0.005	0.049	
Mean outcome	0.655	0.778	0.056	0.122	
SD outcome	0.475	0.415	0.230	0.327	
(b) Frequency					
Wife retired	−0.276	0.185			
	(0.313)	(0.381)			
AR test (p)	0.378	0.627			
Mean outcome	3.971	3.795			
SD outcome	6.145	4.560			
(c) Expenditure					
Wife retired	16.024	4.721			
	(41.714)	(11.307)			
AR test (p)	0.701	0.676			
Mean outcome	108.122	78.736			
SD outcome	630.489	125.817			
N	396,592	396,592	396,592	396,592	396,592
N couples	19,400	19,400	19,400	19,400	19,400

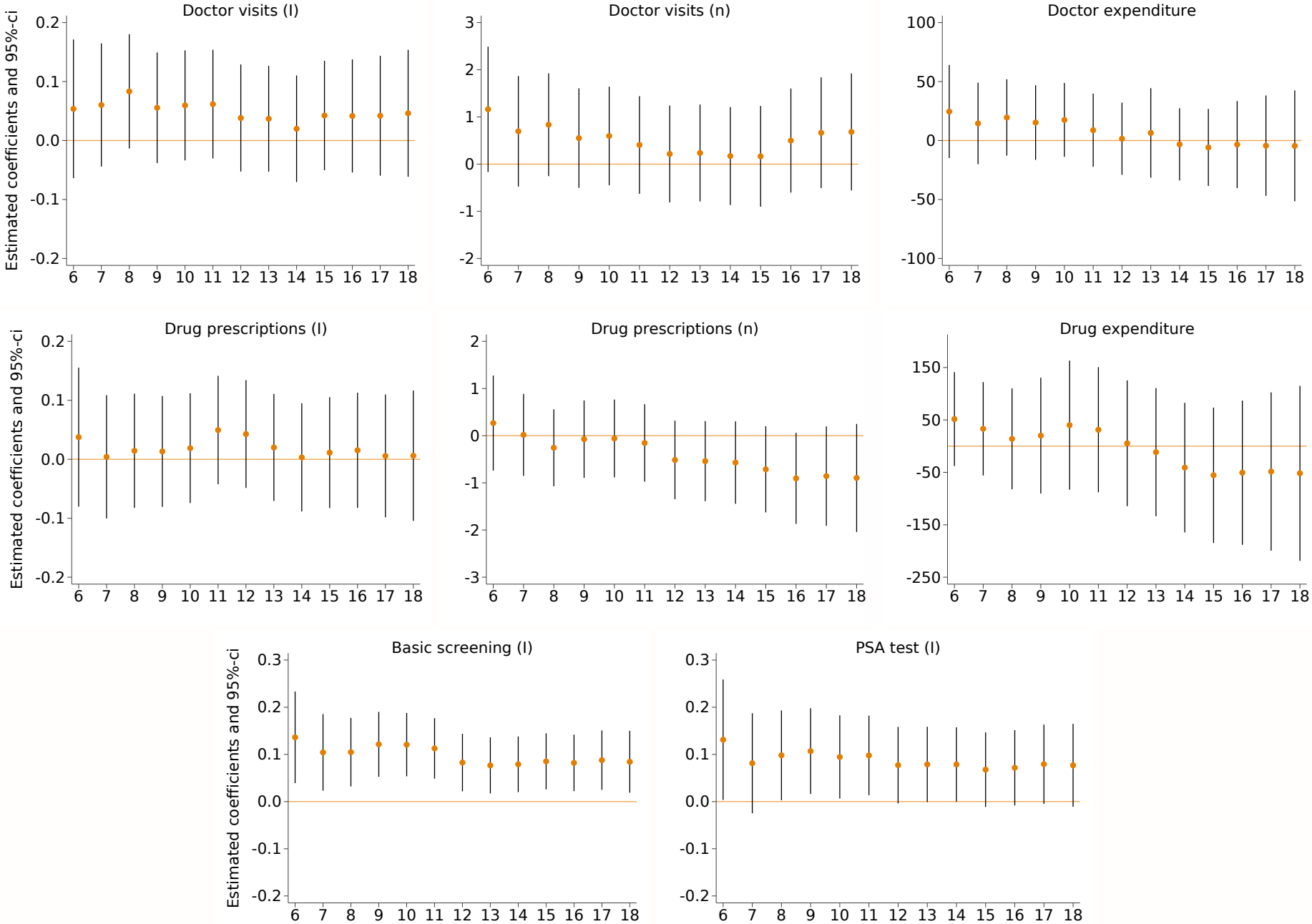
Husbands' inpatient outcomes :: age FE

return

				Cardiovascular diseases (ICD-I)		
	Any disease	Mental	Physical	All	Heart attack	Stroke
(a) Hospitalization						
Wife retired	−0.036	−0.012*	−0.029	−0.020	−0.003	−0.007*
	(0.034)	(0.007)	(0.034)	(0.016)	(0.006)	(0.004)
AR test (p)	0.292	0.088	0.385	0.203	0.623	0.090
Mean outcome	0.086	0.002	0.084	0.016	0.002	0.001
SD outcome	0.280	0.048	0.277	0.126	0.049	0.031
(b) Length of stay						
Wife retired	−1.104***	−0.219	−0.886**	−0.390**	−0.013	−0.165**
	(0.426)	(0.140)	(0.400)	(0.190)	(0.040)	(0.084)
AR test (p)	0.009	0.117	0.026	0.040	0.743	0.049
Mean outcome	0.660	0.036	0.623	0.120	0.013	0.012
SD outcome	3.421	1.030	3.248	1.371	0.344	0.492
(c) Expenditure						
Wife retired	−665.648**	−68.674	−596.974*	−242.306	−3.600	−82.174
	(313.041)	(42.435)	(309.328)	(187.245)	(62.175)	(57.137)
AR test (p)	0.033	0.105	0.053	0.195	0.954	0.150
Mean outcome	431.997	11.923	420.074	105.836	15.052	8.333
SD outcome	2757.308	323.610	2734.326	1444.700	452.680	406.278
N	319,261	319,261	319,261	319,261	319,261	319,261
N couples	17,387	17,387	17,387	17,387	17,387	17,387

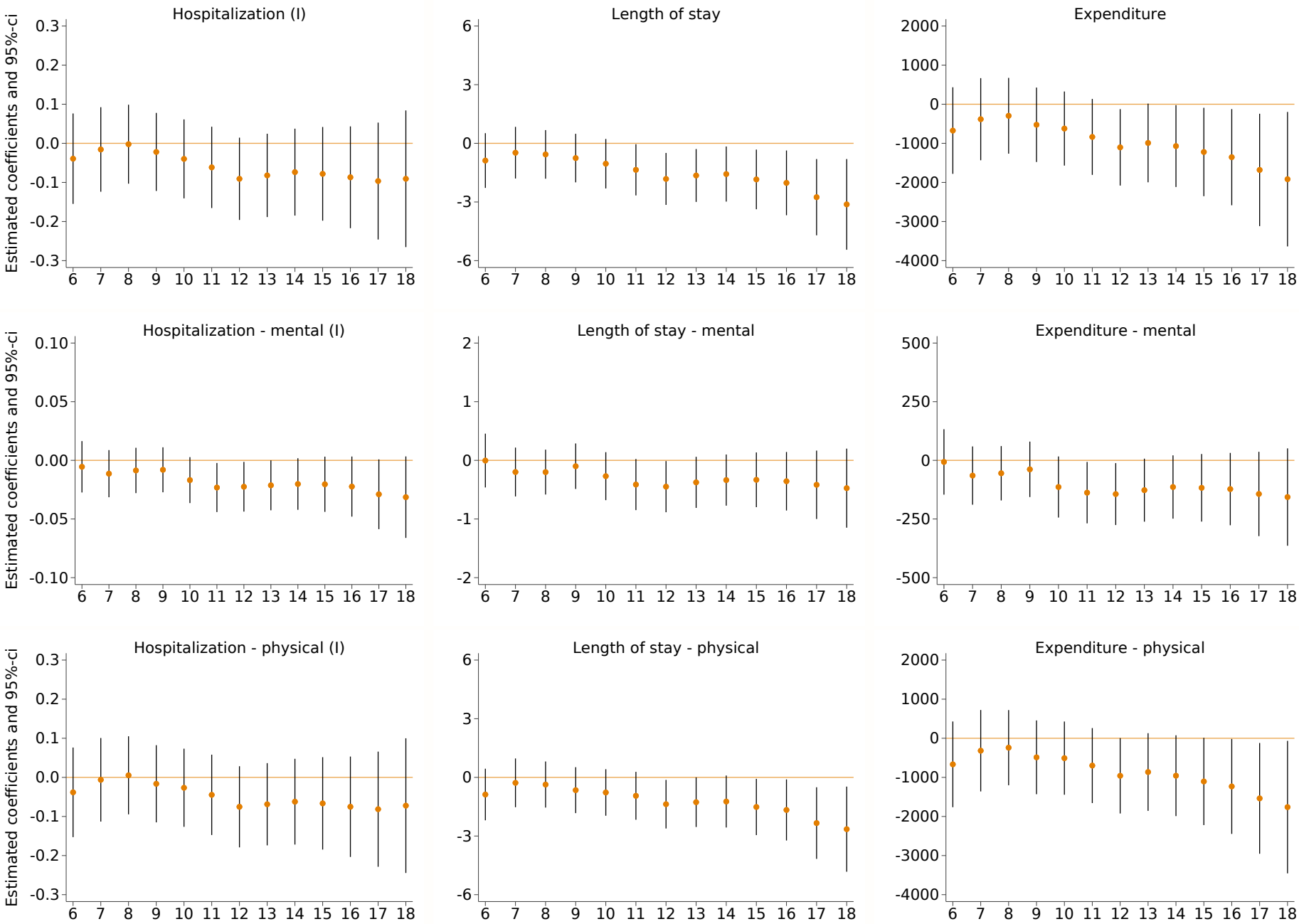
Husbands' outpatient outcomes :: bandwidth

return



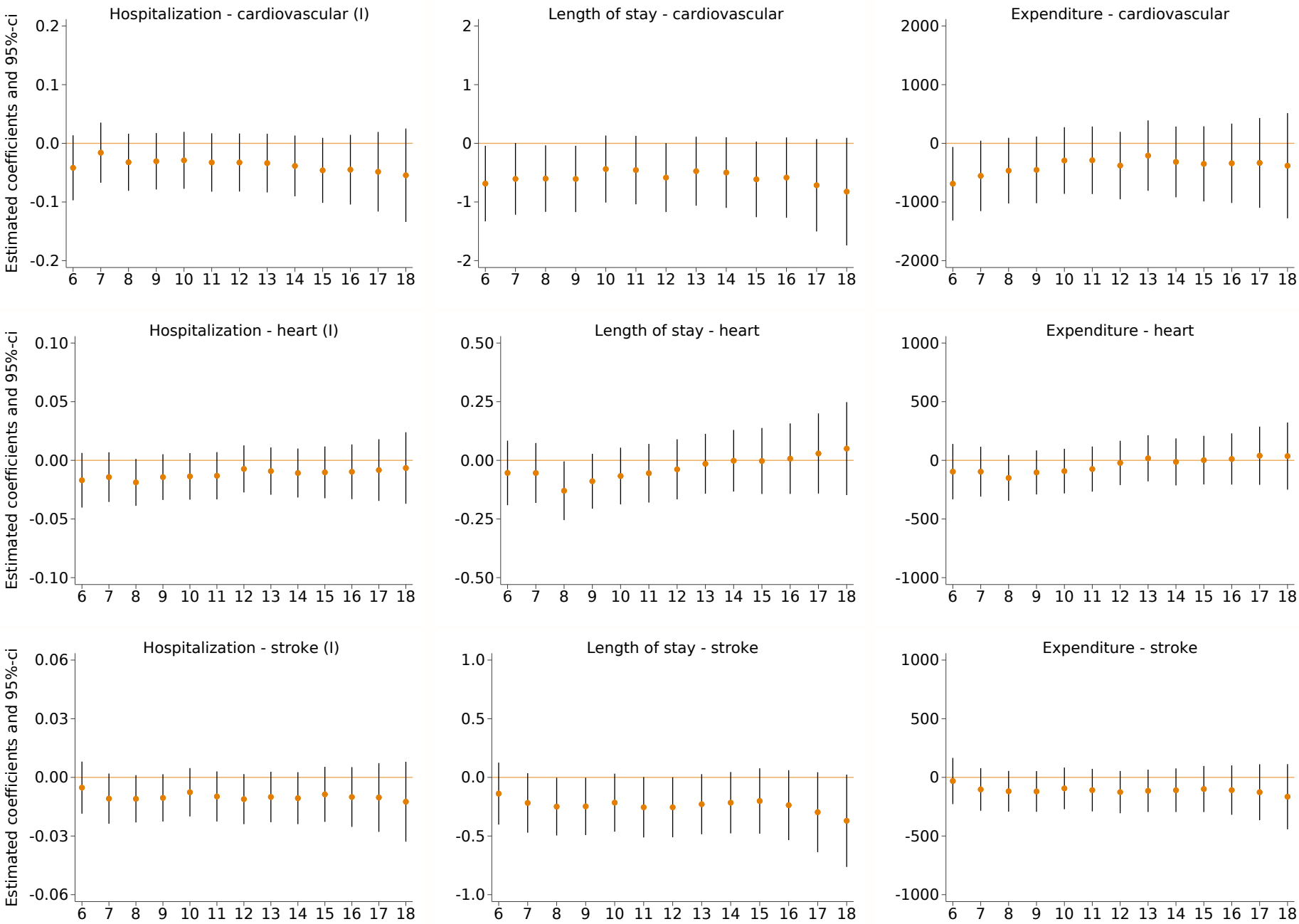
Husbands' inpatient outcomes :: bandwidth

return



Husbands' inpatient outcomes :: bandwidth

return



Husbands' outpatient outcomes :: triangular weights

return

	Drug prescriptions	Doctor visits	Health screening	
			Basic	PSA test
(a) Any				
Wife retired	0.025	0.058	0.115***	0.103**
	(0.045)	(0.045)	(0.034)	(0.044)
AR test (p)	0.571	0.197	0.001	0.020
Mean outcome	0.658	0.780	0.056	0.123
SD outcome	0.474	0.414	0.231	0.328
(b) Frequency				
Wife retired	−0.058	0.619		
	(0.392)	(0.508)		
AR test (p)	0.883	0.223		
Mean outcome	3.995	3.809		
SD outcome	6.153	4.566		
(c) Expenditure				
Wife retired	29.685	14.272		
	(49.811)	(15.200)		
AR test (p)	0.551	0.348		
Mean outcome	106.487	79.016		
SD outcome	592.389	125.405		
N	367,146	367,146	367,146	367,146
N couples	19,296	19,296	19,296	19,296

Husbands' inpatient outcomes :: triangular weights

return

				Cardiovascular diseases (ICD-I)		
	Any disease	**Mental**	**Physical**	All	Heart attack	Stroke
(a) Hospitalization						
Wife retired	−0.031	−0.014	−0.021	−0.031	−0.014	−0.009
	(0.048)	(0.009)	(0.047)	(0.023)	(0.009)	(0.006)
AR test (p)	0.513	0.121	0.662	0.185	0.133	0.132
Mean outcome	0.086	0.002	0.084	0.016	0.002	0.001
SD outcome	0.280	0.048	0.277	0.126	0.049	0.031
(b) Length of stay						
Wife retired	−0.953	−0.225	−0.727	−0.531*	−0.073	−0.214*
	(0.594)	(0.190)	(0.560)	(0.274)	(0.057)	(0.120)
AR test (p)	0.108	0.235	0.194	0.051	0.198	0.074
Mean outcome	0.654	0.036	0.618	0.119	0.013	0.012
SD outcome	3.387	1.000	3.220	1.373	0.353	0.508
(c) Expenditure						
Wife retired	−607.613	−80.812	−526.800	−385.257	−95.888	−92.121
	(448.124)	(58.100)	(443.655)	(271.539)	(93.807)	(88.135)
AR test (p)	0.175	0.163	0.235	0.155	0.306	0.295
Mean outcome	426.446	11.737	414.709	106.224	16.176	8.400
SD outcome	2735.599	314.206	2712.683	1475.446	497.417	430.136
N	296,270	296,270	296,270	296,270	296,270	296,270
N couples	17,106	17,106	17,106	17,106	17,106	17,106

Husbands' outpatient outcomes :: joint retirement

return

	Drug prescriptions	Doctor visits	Health screening		
			Basic	PSA test	
(a) Any					
Wife retired	0.041	0.038	0.083***	0.078*	0.095**
	(0.047)	(0.046)	(0.031)	(0.041)	(0.045)
Husb retired	−0.032	−0.042	−0.003	−0.043***	−0.033*
	(0.031)	(0.026)	(0.010)	(0.016)	(0.017)
AR test (p)	0.464	0.236	0.015	0.017	0.048
Mean outcome	0.655	0.778	0.056	0.122	0.143
SD outcome	0.475	0.415	0.230	0.327	0.350
(b) Frequency					
Wife retired	−0.514	0.236			
	(0.425)	(0.523)			
Husb retired	0.079	−0.461			
	(0.451)	(0.291)			
AR test (p)	0.479	0.283			
Mean outcome	3.971	3.795			
SD outcome	6.145	4.560			
(c) Expenditure					
Wife retired	6.357	1.805			
	(61.140)	(15.621)			
Husb retired	30.027	−13.131			
	(37.502)	(7.996)			
AR test (p)	0.692	0.247			
Mean outcome	108.122	78.736			
SD outcome	630.489	125.817			
N	396,592	396,592	396,592	396,592	396,592
N couples	19,400	19,400	19,400	19,400	19,400

Husbands' inpatient outcomes :: joint retirement

return

				Cardiovascular diseases (ICD-I)		
	Any disease	**Mental**	**Physical**	All	Heart attack	Stroke
(a) Hospitalization						
Wife retired	−0.091*	−0.023**	−0.075	−0.032	−0.008	−0.011*
	(0.054)	(0.011)	(0.053)	(0.025)	(0.010)	(0.007)
Husb retired	−0.001	0.004	−0.003	−0.008	−0.004	0.003
	(0.026)	(0.005)	(0.026)	(0.011)	(0.004)	(0.003)
AR test (p)	0.187	0.102	0.289	0.170	0.204	0.216
Mean outcome	0.086	0.002	0.084	0.016	0.002	0.001
SD outcome	0.280	0.048	0.277	0.126	0.049	0.031
(b) Length of stay						
Wife retired	−1.818***	−0.450**	−1.368**	−0.573*	−0.040	−0.255*
	(0.678)	(0.223)	(0.634)	(0.300)	(0.065)	(0.131)
Husb retired	0.046	0.072	−0.026	0.050	−0.026	0.028
	(0.345)	(0.100)	(0.321)	(0.117)	(0.025)	(0.042)
AR test (p)	0.016	0.123	0.057	0.139	0.306	0.139
Mean outcome	0.660	0.036	0.623	0.120	0.013	0.012
SD outcome	3.421	1.030	3.248	1.371	0.344	0.492
(c) Expenditure						
Wife retired	−1101.117**	−145.058**	−956.059*	−375.589	−23.055	−126.364
	(498.524)	(67.331)	(491.862)	(294.276)	(96.413)	(92.618)
Husb retired	−139.177	27.632	−166.809	−78.127	−54.062	−0.441
	(272.188)	(31.077)	(268.015)	(123.671)	(34.662)	(33.906)
AR test (p)	0.025	0.093	0.044	0.163	0.151	0.286
Mean outcome	431.997	11.923	420.074	105.836	15.052	8.333
SD outcome	2757.308	323.610	2734.326	1444.700	452.680	406.278
N	319,261	319,261	319,261	319,261	319,261	319,261
N couples	17,387	17,387	17,387	17,387	17,387	17,387

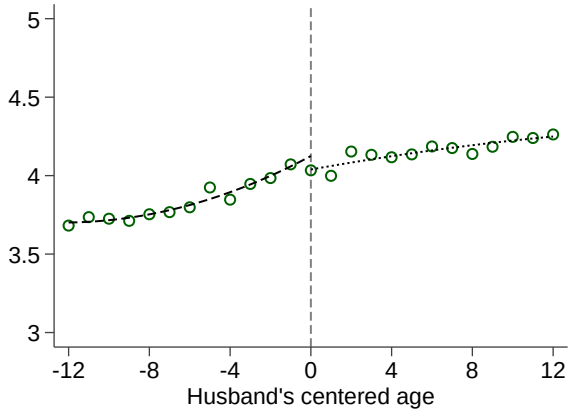
Wives' outpatient outcomes :: age FE

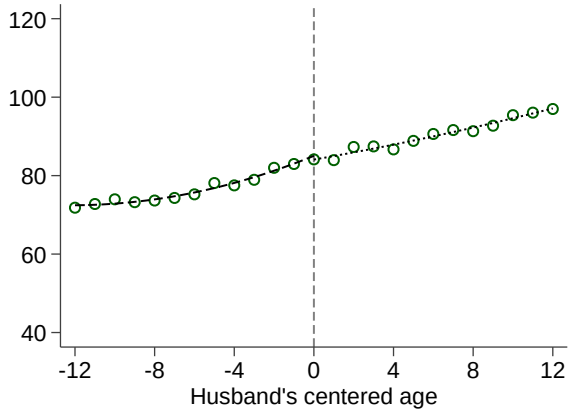
return

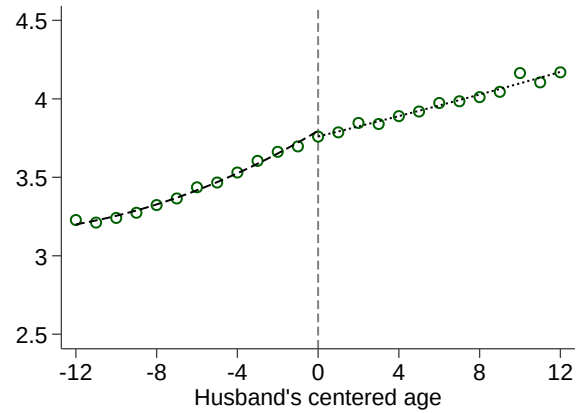
	Drug prescriptions	Doctor visits	Health screening	
			Basic	Gyn/man/col test
(a) Any				
Husb retired	−0.013	−0.032	−0.017	−0.038
	(0.066)	(0.061)	(0.037)	(0.059)
AR test (p)	0.843	0.605	0.634	0.521
Mean outcome	0.652	0.789	0.051	0.153
(b) Frequency				
Husb retired	0.986*	0.087		
	(0.539)	(0.686)		
AR test (p)	0.066	0.899		
Mean outcome	3.683	3.987		
SD outcome	5.917	4.753		
(c) Expenditure				
Husb retired	−1.493	11.650		
	(29.386)	(16.495)		
AR test (p)	0.959	0.480		
Mean outcome	84.869	83.022		
SD outcome	368.931	135.148		
N	299,795	299,795	299,795	299,795	299,795
N couples	15,088	15,088	15,088	15,088	15,088

Wives' outpatient outcomes :: reduced form

return

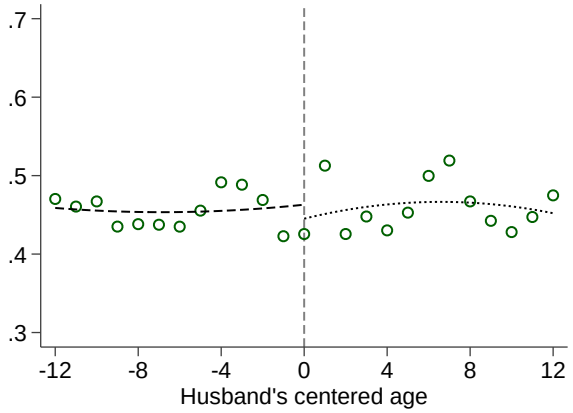


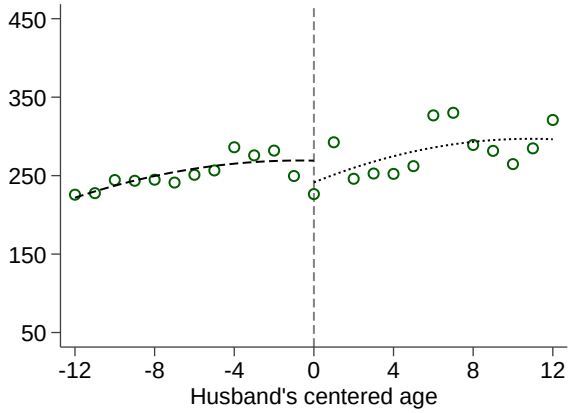


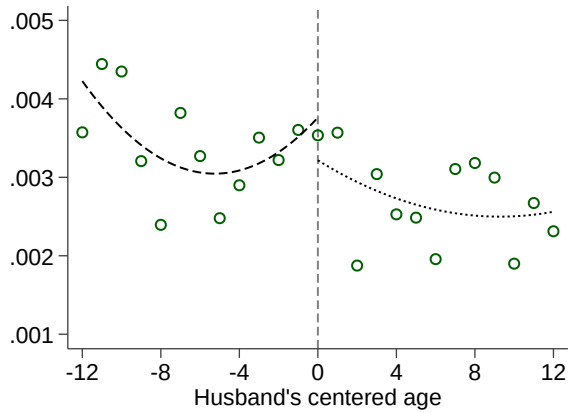


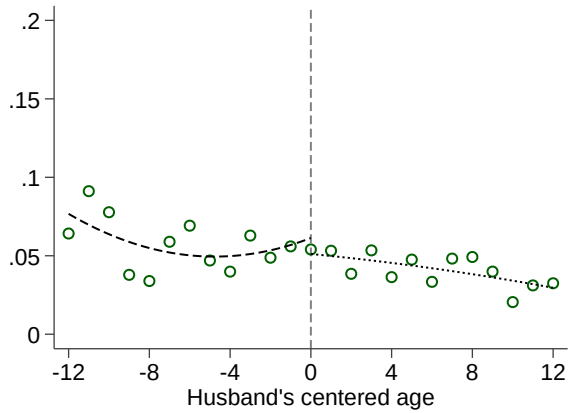
Wives' inpatient outcomes :: reduced form

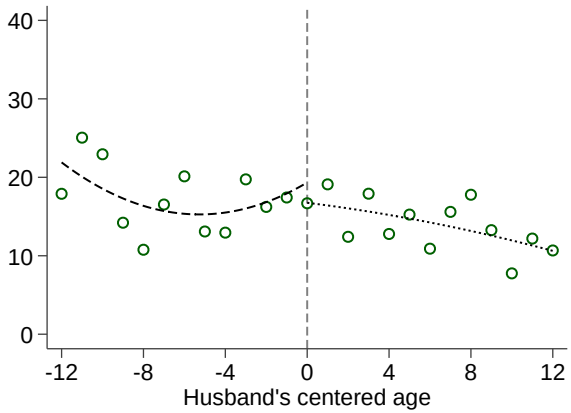
return

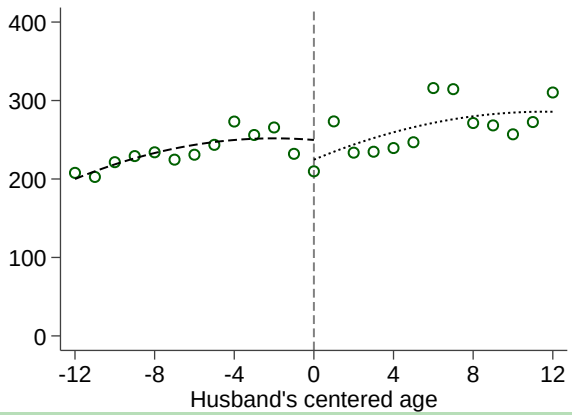






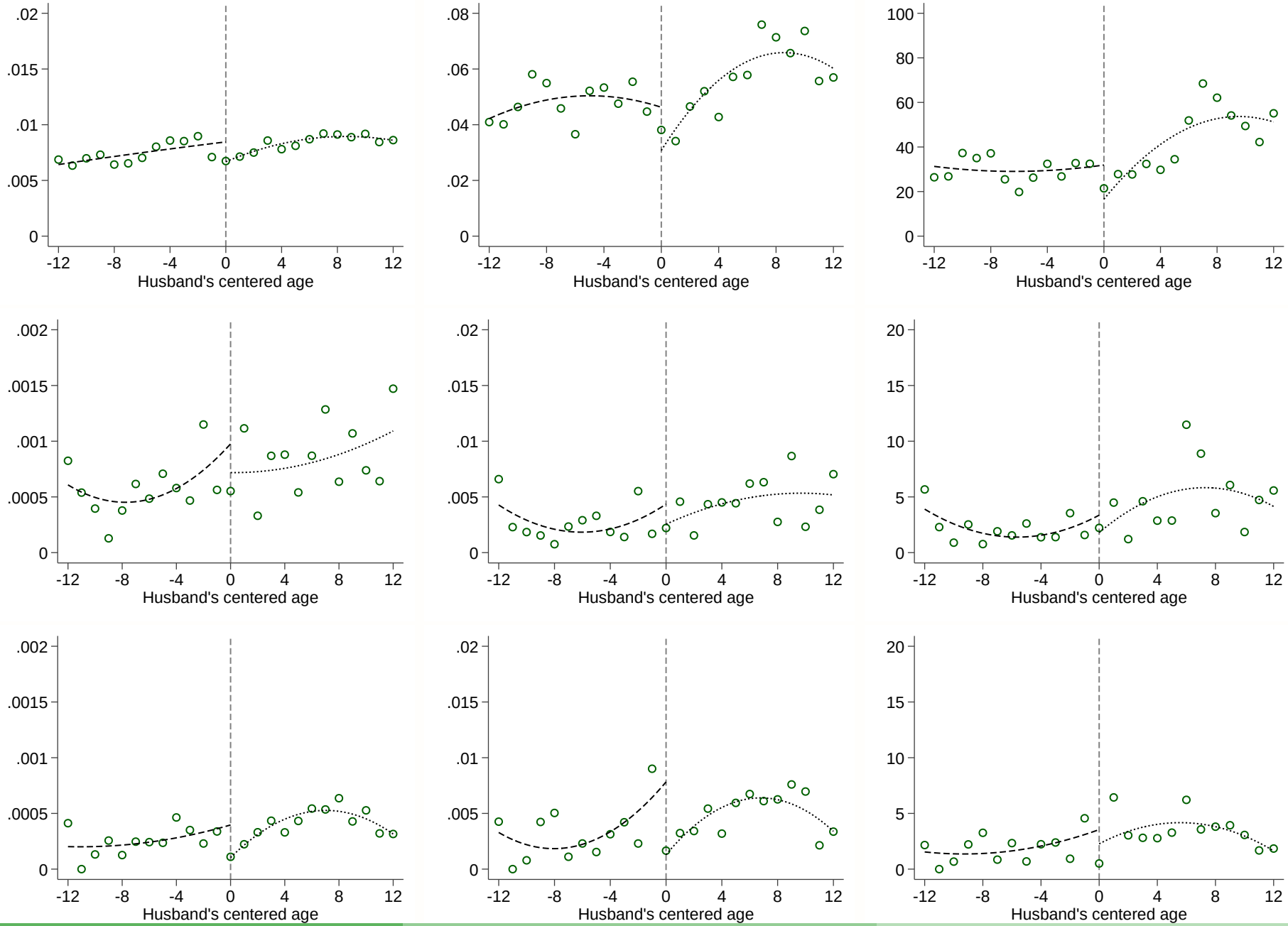






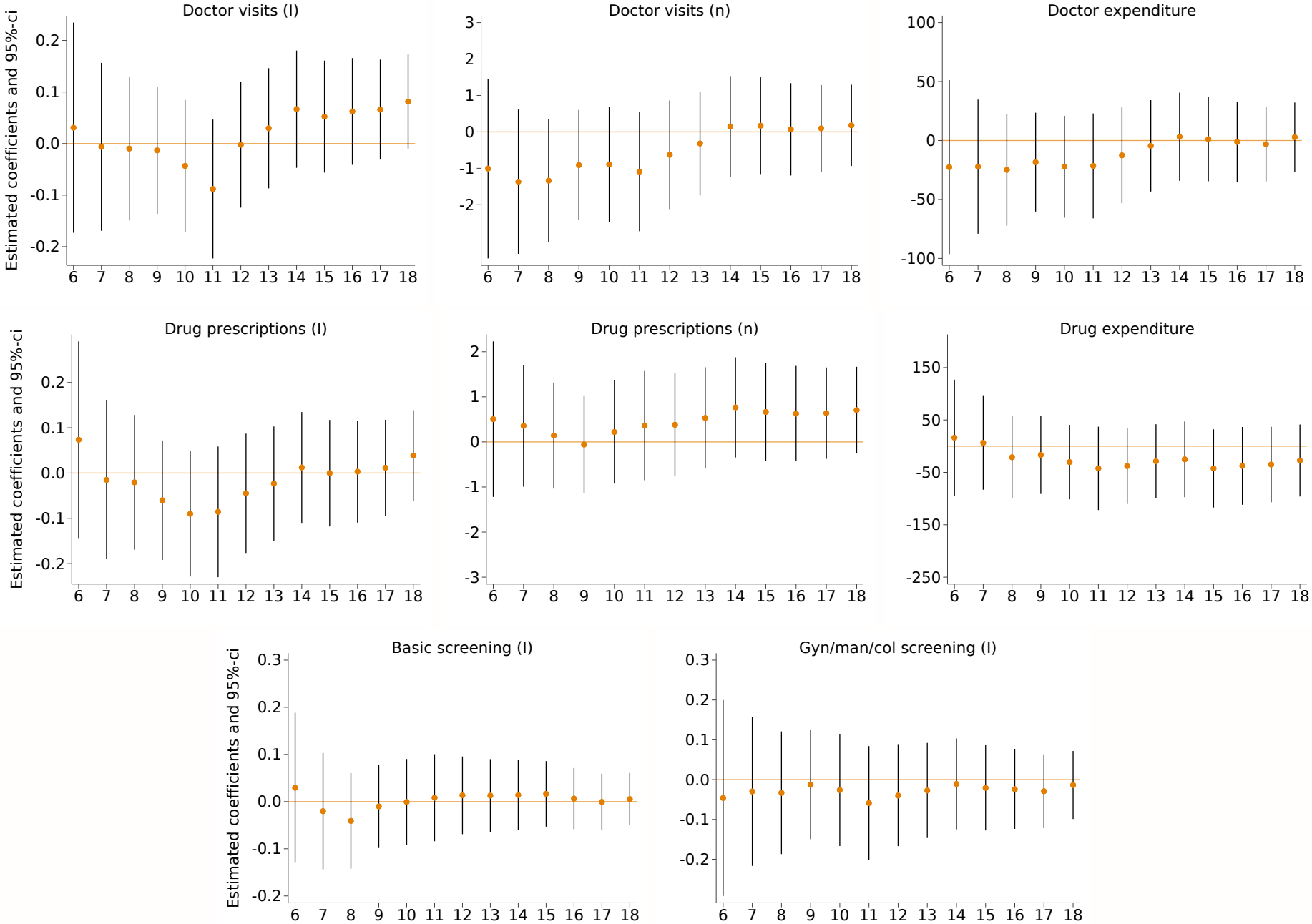
Wives' inpatient outcomes :: reduced form

return



Wives' outpatient outcomes :: bandwidth

return



Wives' outpatient outcomes :: triangular weights

return

	Drug prescriptions	Doctor visits	Health screening	
			Basic	Gyn/man/col
(a) Any				
Husb retired	−0.053	−0.034	−0.004	−0.037
	(0.070)	(0.066)	(0.048)	(0.074)
AR test (p)	0.454	0.604	0.936	0.620
Mean outcome	0.656	0.792	0.052	0.153
SD outcome	0.475	0.406	0.221	0.360
(b) Frequency				
Husb retired	0.219	−1.118		
	(0.573)	(0.807)		
AR test (p)	0.703	0.164		
Mean outcome	3.707	4.009		
SD outcome	5.939	4.768		
(c) Expenditure				
Husb retired	−24.628	−22.748		
	(36.067)	(22.394)		
AR test (p)	0.494	0.309		
Mean outcome	85.159	83.138		
SD outcome	343.027	134.927		
N	276,594	276,594	276,594	276,594
N couples	14,933	14,933	14,933	14,933

Wives' inpatient outcomes :: triangular weights

return

	Any disease	Mental	Physical	Cardiovascular diseases (ICD-I)		
				All	Heart attack	Stroke
(a) Hospitalization						
Husb retired	−0.128	−0.014	−0.120	−0.027	−0.003	−0.004
	(0.088)	(0.020)	(0.086)	(0.032)	(0.010)	(0.006)
AR test (p)	0.143	0.485	0.162	0.391	0.745	0.514
Mean outcome	0.065	0.003	0.062	0.008	0.001	0.000
SD outcome	0.247	0.055	0.242	0.088	0.027	0.018
(b) Length of stay						
Husb retired	0.247	−0.203	0.450	−0.403	−0.017	−0.169
	(0.973)	(0.494)	(0.818)	(0.302)	(0.043)	(0.140)
AR test (p)	0.799	0.681	0.582	0.178	0.693	0.224
Mean outcome	0.457	0.049	0.408	0.050	0.003	0.004
SD outcome	2.678	1.219	2.377	0.826	0.165	0.287
(c) Expenditure						
Husb retired	−465.658	−63.324	−402.334	−477.470*	−12.240	−31.812
	(635.092)	(140.772)	(606.604)	(267.695)	(47.567)	(96.530)
AR test (p)	0.463	0.653	0.507	0.070	0.797	0.742
Mean outcome	265.794	15.751	250.044	33.480	3.216	2.885
SD outcome	1729.799	365.608	1689.221	782.946	240.030	226.105
N	201,136	201,136	201,136	201,136	201,136	201,136
N couples	12,285	12,285	12,285	12,285	12,285	12,285

Wives' outpatient outcomes :: joint retirement

return

	Drug prescriptions	Doctor visits	Health screening		
			Basic	Gyn/man/col	
(a) Any					
Husb retired	−0.042	−0.003	0.015	−0.038	−0.004
	(0.067)	(0.062)	(0.042)	(0.065)	(0.071)
Wife retired	0.166	0.135	0.009	0.120**	0.130**
	(0.105)	(0.088)	(0.029)	(0.055)	(0.061)
AR test (p)	0.233	0.309	0.897	0.071	0.087
Mean outcome	0.652	0.789	0.051	0.153	0.188
SD outcome	0.476	0.408	0.221	0.360	0.391
(b) Frequency					
Husb retired	0.385	−0.597			
	(0.583)	(0.759)			
Wife retired	1.809	1.200			
	(1.444)	(1.015)			
AR test (p)	0.358	0.367			
Mean outcome	3.683	3.987			
SD outcome	5.917	4.753			
(c) Expenditure					
Husb retired	−33.002	−11.999			
	(36.309)	(20.699)			
Wife retired	−22.408	44.020			
	(96.671)	(26.898)			
AR test (p)	0.625	0.206			
Mean outcome	84.869	83.022			
SD outcome	368.931	135.148			
N	299,795	299,795	299,795	299,795	299,795
N couples	15,088	15,088	15,088	15,088	15,088

Wives' inpatient outcomes :: joint retirement

return

				Cardiovascular diseases (ICD-I)		
	Any disease	**Mental**	**Physical**	All	Heart attack	Stroke
(a) Hospitalization						
Husb retired	−0.185*	−0.021	−0.171	−0.063	−0.008	−0.009
	(0.111)	(0.026)	(0.109)	(0.040)	(0.013)	(0.008)
Wife retired	−0.044	−0.026	−0.026	−0.037	−0.002	−0.000
	(0.076)	(0.016)	(0.073)	(0.025)	(0.006)	(0.004)
AR test (p)	0.186	0.172	0.253	0.059	0.745	0.519
Mean outcome	0.065	0.003	0.062	0.008	0.001	0.000
SD outcome	.246	.0547	.242	.0886	.0269	.0183
(b) Length of stay						
Husb retired	−0.565	−0.415	−0.150	−0.578	−0.059	−0.197
	(1.238)	(0.596)	(1.049)	(0.382)	(0.065)	(0.156)
Wife retired	−1.137	−0.613*	−0.524	−0.424*	−0.017	0.021
	(0.772)	(0.340)	(0.652)	(0.248)	(0.031)	(0.054)
AR test (p)	0.257	0.118	0.700	0.050	0.507	0.337
Mean outcome	0.458	0.048	0.410	0.053	0.004	0.004
SD outcome	2.7	1.2	2.41	.887	.185	.278
(c) Expenditure						
Husb retired	−962.595	−110.251	−852.345	−597.771*	−36.410	−26.273
	(806.653)	(173.962)	(764.693)	(352.638)	(66.447)	(113.470)
Wife retired	−655.668	−140.298	−515.370	−497.359	−24.082	31.103
	(594.666)	(93.253)	(574.213)	(337.194)	(30.482)	(31.289)
AR test (p)	0.247	0.230	0.349	0.144	0.504	0.469
Mean outcome	267.734	15.408	252.325	37.157	3.533	2.666
SD outcome	1772	357	1734	877	252	198
N	217,928	217,928	217,928	217,928	217,928	217,928
N couples	12,643	12,643	12,643	12,643	12,643	12,643

First stage :: heterogeneity

return

	All	0	1
Wife in labor force (age 50)	0.068***	0.053***	0.076***
	(0.003)	(0.004)	(0.004)
Wife employed (age 50)	0.068***	0.057***	0.074***
	(0.003)	(0.004)	(0.004)
Husband in labor force (age 55)	0.068***	0.100***	0.057***
	(0.003)	(0.006)	(0.003)
Husband employed (age 55)	0.068***	0.099***	0.056***
	(0.003)	(0.006)	(0.003)
Husband disability (before cutoff)	0.068***	0.066***	0.079***
	(0.003)	(0.003)	(0.007)
Mean of outcome	0.373	0.367	0.400
N	396,592	320,870	75,722
N individuals	19,400	15,766	3,634