Online Appendix

Appendix A: Tables

Table A.1: Additional Summary Statistics

	Below age cutoffs: [-2, 0)		Above age cutoffs: Not retire [0, 2)		Above age cutoffs: Retire [0, 2)		Compliers below age cutoffs		Compliers above age cutoffs	
Variable	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**
Outpatient incidence	0.154	0.361	0.158	0.366	0.186	0.390	0.118	0.327	0.206	0.410
# Doctor visits	0.310	1.222	0.333	0.969	0.394	1.282	0.176	0.521	0.294	0.629
Outpatient cost	52.790	411.390	49.497	286.059	125.475	1044.241	10.794	44.014	60.588	342.840
Inpatient incidence	0.082	0.275	0.095	0.294	0.169	0.375	0.059	0.239	0.176	0.387
# Hospital stays	0.092	0.329	0.117	0.400	0.274	0.768	0.059	0.239	0.382	1.129
Inpatient cost	34.653	511.687	50.279	477.279	815.527	4604.855	0	0	1926.471	7885.672
Self-treatment incidence	0.552	0.498	0.592	0.493	0.608	0.489	0.676	0.475	0.706	0.462
Self-treatment cost	65.905	169.341	76.531	162.527	145.979	340.948	93.724	129.145	117.794	245.743
Health check incidence	0.599	0.491	0.570	0.496	0.608	0.489	0.794	0.410	0.618	0.493
Forgone outpatient incidence	0.074	0.263	0.089	0.286	0.063	0.244	0.088	0.288	0.088	0.288
Forgone inpatient incidence	0.027	0.163	0.056	0.230	0.046	0.211	0	0	0.088	0.288
Self-reported health	3.573	0.888	3.689	0.850	3.779	0.845	3.778	0.801	3.875	0.660
Retirement	0.218	0.413	0	0	1	0	0	0	1	0
Male	0.535	0.499	0.475	0.501	0.646	0.479	0.676	0.475	0.676	0.475
Age	53.854	5.041	55.196	5.099	57.004	4.829	55.353	4.867	57.382	4.948
Partner	0.906	0.292	0.916	0.278	0.895	0.308	0.912	0.288	0.912	0.288
Low education	0.198	0.399	0.307	0.463	0.165	0.372	0.147	0.359	0.147	0.359
Middle education	0.698	0.460	0.615	0.488	0.772	0.420	0.853	0.359	0.853	0.359
High education	0.101	0.302	0.078	0.269	0.063	0.244	0	0	0	0
Pension	0.634	0.482	0.629	0.484	0.626	0.485	0.588	0.500	0.912	0.288
Medical Insurance	0.958	0.201	0.944	0.230	0.945	0.228	0.941	0.239	1	0
Mental health	11.772	3.864	11.944	3.584	11.281	3.453	11.613	4.112	10.548	2.644
Life Satisfaction	2.885	0.632	2.987	0.703	2.868	0.601	2.621	0.775	2.839	0.523

Individual income	25808.21	17933.66	26520.03	16372.82	25634.26	14790.84	25537.38	12398.23	36183.03	14294.31
Chronic disease	0.550	0.498	0.575	0.496	0.646	0.479	0.5	0.508	0.559	0.504
Smoking	0.253	0.435	0.232	0.423	0.271	0.445	0.185	0.396	0.185	0.396
BMI	24.437	3.905	24.753	4.106	25.173	4.460	26.046	5.487	26.259	3.091
Systolic blood pressure	125.294	20.244	126.801	20.861	129.803	19.999	128.258	18.587	136.246	21.404
Diastolic blood pressure	77.491	12.452	76.720	12.208	79.598	12.007	79.485	10.520	84.652	10.981
Diabetes	0.062	0.242	0.076	0.265	0.128	0.335	0.176	0.387	0.206	0.410
Cancer	0.005	0.072	0.017	0.131	0.026	0.161	0.029	0.171	0.059	0.239
Stomach disease	0.151	0.359	0.253	0.436	0.162	0.369	0.088	0.288	0.088	0.288
Observations	404		179		237		34		34	

Notes: “Below age cutoffs: [-2, 0)” refers to those who are 2 years below the statutory full retirement ages. “Above age cutoffs: Not retire [0, 2)” refers to those who are 2 years above the statutory full retirement ages but not retired (retire defined as processed retirement and stop working). “Above age cutoffs: Retire [0, 2)” refers to those who are 2 years above the statutory full retirement ages and retired. In last four columns, “Compliers” refers to those individuals who were below retirement age and working in the first wave and above retirement age and retired in the second wave. For the compliers, the sample mean of variable “Pension” changes substantially across waves. This is not because of retirement (And we verified that controlling for pension or not does not influence the IV fixed effects estimation results), but because of the measurement error caused by the change of survey question used to construct this variable. See footnote 18 for the details.

Table A.2: Full Version of Column (1) Table 4 (OLS Estimates)

Dependent variable	(1) Outpatient incidence	(2) #Dr. visits	(3) Outpatient cost	(4) Inpatient incidence	(5) # Hospital stays	(6) Inpatient cost	(7) Self-treatment incidence	(8) Self-treatment cost	(9) Health check incidence	(10) Forgone outpatient incidence	(11) Forgone inpatient incidence	(12) Self-reported health
Retirement	0.032**	0.059	48.688***	0.065***	0.112***	277.027***	0.052***	59.403***	0.030	-0.011	0.001	0.143***
	(0.014)	(0.066)	(17.365)	(0.012)	(0.020)	(90.850)	(0.018)	(11.383)	(0.018)	(0.009)	(0.008)	(0.035)
Age	-0.054	-0.316	94.132	0.131*	0.210	143.994	-0.261**	27.139	-0.205*	0.042	-0.000	0.494**
	(0.098)	(0.332)	(78.008)	(0.078)	(0.156)	(503.128)	(0.124)	(67.710)	(0.117)	(0.060)	(0.043)	(0.248)
Age^2	0.001	0.006	-1.545	-0.002*	-0.004	-2.122	0.005**	-0.485	0.003*	-0.001	0.000	-0.008*
	(0.002)	(0.006)	(1.332)	(0.001)	(0.003)	(8.753)	(0.002)	(1.171)	(0.002)	(0.001)	(0.001)	(0.004)
Age^3	-0.000	-0.000	0.008	0.000*	0.000	0.010	-0.000**	0.003	-0.000	0.000	-0.000	0.000*
	(0.000)	(0.000)	(0.007)	(0.000)	(0.000)	(0.050)	(0.000)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)
Male	-0.063***	-0.190***	-17.377	0.026**	0.043**	139.935*	-0.053***	-20.743*	-0.047***	-0.004	-0.011	-0.025
	(0.013)	(0.057)	(13.036)	(0.011)	(0.020)	(80.205)	(0.016)	(10.803)	(0.015)	(0.008)	(0.007)	(0.031)
Partner	0.012	0.029	-10.746	0.030**	0.070***	129.789	0.036*	20.263	0.056***	-0.010	-0.000	0.047
	(0.017)	(0.066)	(15.627)	(0.014)	(0.023)	(98.268)	(0.021)	(12.486)	(0.021)	(0.011)	(0.008)	(0.042)
Middle education	0.011	0.002	-11.502	-0.005	-0.022	-37.462	0.009	22.200*	0.105***	-0.018*	-0.001	-0.113***
	(0.014)	(0.064)	(16.242)	(0.012)	(0.024)	(101.177)	(0.018)	(11.954)	(0.017)	(0.009)	(0.007)	(0.035)
High education	0.006	-0.041	-17.119	-0.022	-0.067**	-202.541**	-0.000	42.183**	0.292***	-0.029**	-0.015	-0.300***
	(0.021)	(0.073)	(17.550)	(0.018)	(0.028)	(84.043)	(0.027)	(19.196)	(0.024)	(0.013)	(0.010)	(0.055)
Constant	1.203	5.824	-1,806.230	-2.398	-3.794	-3,262.560	5.273**	-483.612	4.512**	-0.709	-0.064	-6.643
	(1.892)	(6.210)	(1,499.083)	(1.476)	(2.905)	(9,490.451)	(2.401)	(1,284.186)	(2.266)	(1.162)	(0.809)	(4.810)
Observations	5,162	5,162	5,178	5,176	5,173	5,178	5,163	5,178	5,178	5,178	5,178	4,454
R-squared	0.016	0.009	0.004	0.030	0.030	0.005	0.018	0.017	0.035	0.002	0.004	0.042

Note:*Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses show robust standard errors clustered at the person level.

Table A.3: Full Version of Column (2) Table 4 (Nonparametric Fuzzy RD Estimates)

Outcome	First-stage Retirement	Treatment **Outpatient Incidence**	Cutoff c = 0	Left of c	Right of c
Conventional	0.296***	0.104	BW loc. poly. (h)	3.643	6.428
	(0.052)	(0.149)	BW bias (b)	7.503	8.453
Robust	0.287***	0.103	rho (h/b)	0.486	0.760
	(0.062)	(0.183)	# clusters	861	1323
			# obs	1803	3359

Outcome	First-stage Retirement	Treatment **# Doctor visits**	Cutoff c = 0	Left of c	Right of c
Conventional	0.286***	0.816*	BW loc. poly. (h)	3.245	5.175
	(0.057)	(0.433)	BW bias (b)	7.611	7.835
Robust	0.281***	0.887*	rho (h/b)	0.426	0.661
	(0.065)	(0.508)	# clusters	861	1215
			# obs	1803	3359

Outcome	First-stage Retirement	Treatment **Outpatient Cost**	Cutoff c = 0	Left of c	Right of c
Conventional	0.307***	0.289	BW loc. poly. (h)	3.808	9.113
	(0.050)	(231.81)	BW bias (b)	7.456	10.489
Robust	0.292***	-19.655	rho (h/b)	0.511	0.869
	(0.060)	(292.76)	# clusters	863	1551
			# obs	1809	3369

Outcome	First-stage Retirement	Treatment **Inpatient incidence**	Cutoff c = 0	Left of c	Right of c
Conventional	0.297***	0.163	BW loc. poly. (h)	3.232	7.954
	(0.055)	(0.131)	BW bias (b)	7.211	9.406
Robust	0.284***	0.208	rho (h/b)	0.448	0.846
	(0.066)	(0.159)	# clusters	862	1457
			# obs	1808	3368

Outcome	First-stage Retirement	Treatment **#Hospital stays**	Cutoff c = 0	Left of c	Right of c
Conventional	0.285***	0.409*	BW loc. poly. (h)	2.709	6.836
	(0.071)	(0.225)	BW bias (b)	6.542	8.215
Robust	0.273***	0.491*	rho (h/b)	0.414	0.832
	(0.080)	(0.261)	# clusters	809	1328
			# obs	1808	3365

Outcome	First-stage Retirement	Treatment **Inpatient cost**	Cutoff c = 0	Left of c	Right of c
Conventional	0.291***	1517.6**	BW loc. poly. (h)	2.238	7.362
	(0.070)	(610.66)	BW bias (b)	6.900	8.303
Robust	0.276***	1660.4**	rho (h/b)	0.324	0.887
	(0.079)	(690.43)	# clusters	810	1328
			# obs	1809	3369

Outcome	First-stage Retirement	Treatment **Self-treatment incidence**	Cutoff c = 0	Left of c	Right of c
Conventional	0.303***	0.096	BW loc. poly. (h)	3.760	8.486
	(0.050)	(0.198)	BW bias (b)	7.862	10.938
Robust	0.289***	0.102	rho (h/b)	0.478	0.776
	(0.060)	(0.241)	# clusters	861	1548
			# obs	1800	3363

Outcome	First-stage Retirement	Treatment **Self-treatment cost**	Cutoff c = 0	Left of c	Right of c
Conventional	0.285***	177.29**	BW loc. poly. (h)	3.210	5.443
	(0.057)	(90.01)	BW bias (b)	7.306	8.209
Robust	0.280***	170.06	rho (h/b)	0.439	0.663
	(0.066)	(107.36)	# clusters	863	1328
			# obs	1809	3369

Outcome	First-stage Retirement	Treatment **Health check incidence**	Cutoff c = 0	Left of c	Right of c
			# obs	1809	3369

Outcome	First-stage Retirement	Treatment **Forgone outpatient incidence**	Cutoff c = 0	Left of c	Right of c
			# obs	1809	3369

Conventional	0.309***	-0.051	BW loc. poly. (h)	3.737	9.594	Conventional	0.295***	0.004	BW loc. poly. (h)	3.654	6.934
	(0.050)	(0.187)	BW bias (b)	7.568	11.922		(0.051)	(0.110)	BW bias (b)	7.528	8.707
Robust	0.296***	-0.040	rho (h/b)	0.494	0.805	Robust	0.284***	0.010	rho (h/b)	0.485	0.796
	(0.060)	(0.229)	# clusters	863	1644		(0.061)	(0.135)	# clusters	863	1328
	First-stage	Treatment	Cutoff c = 0	Left of c	Right of c		First-stage	Treatment	Cutoff c = 0	Left of c	Right of c
Outcome	Retirement	**Forgone inpatient incidence**	# obs	1809	3369	Outcome	Retirement	**Self-reported health**	# obs	1583	2871
Conventional	0.305***	0.079	BW loc. poly. (h)	3.631	8.932	Conventional	0.294***	0.069	BW loc. poly. (h)	3.467	6.484
	(0.051)	(0.068)	BW bias (b)	7.610	10.744		(0.057)	(0.395)	BW bias (b)	7.227	8.858
Robust	0.292***	0.068	rho (h/b)	0.477	0.831	Robust	0.290***	0.060	rho (h/b)	0.480	0.732
	(0.061)	(0.083)	# clusters	863	1551		(0.069)	(0.491)	# clusters	774	1226

Notes: *Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses show robust standard errors clustered at the person level. "Conventional" refers to estimates using conventional coefficient and variance estimators, and "Robust" refers to estimates using bias-corrected coefficient estimators and robust variance estimators.

Table A.4: First Stage Results for Linear-IV Regression with Restricted Sample (±10 yrs)

Dependent variable	Retirement
Age ≥ 60 (or 50)	0.302***
	(0.030)
Age	-0.413***
	(0.159)
Age^2	0.009***
	(0.003)
Age^3	-0.000***
	(0.000)
Male	-0.212***
	(0.027)
Partner	-0.019
	(0.024)
Middle education	0.142***
	(0.021)
High education	0.091***
	(0.028)
F-Statistic	249.42
P-value	(0.000)
Observations	3528

Note:*Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses show robust standard errors clustered at the person level.

Table A.5 Linear-IV Estimates with Restricted Sample (±10 yrs)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	Outpatient incidence	#Dr. visits	Outpatient cost	Inpatient incidence	# Hospital stays	Inpatient cost	Self-treatment incidence	Self-treatment cost	Health check incidence	Forgone outpatient incidence	Forgone inpatient incidence	Self-reported health
Retirement	0.095	0.341	153.283	0.127*	0.238**	556.356	0.254**	178.762***	-0.026	-0.007	0.084*	0.380*
	(0.081)	(0.287)	(110.622)	(0.066)	(0.105)	(451.243)	(0.110)	(62.585)	(0.105)	(0.056)	(0.044)	(0.205)
Age	0.052	-0.463	76.474	0.108	0.225	-372.360	0.163	462.955***	-0.172	0.116	-0.006	0.990**
	(0.170)	(0.494)	(119.049)	(0.133)	(0.212)	(642.504)	(0.229)	(152.032)	(0.211)	(0.115)	(0.076)	(0.446)
Age^2	-0.001	0.008	-1.368	-0.002	-0.005	6.614	-0.003	-8.591***	0.003	-0.002	0.000	-0.017**
	(0.003)	(0.009)	(2.125)	(0.002)	(0.004)	(11.675)	(0.004)	(2.798)	(0.004)	(0.002)	(0.001)	(0.008)
Age^3	0.000	-0.000	0.007	0.000	0.000	-0.041	0.000	0.052***	-0.000	0.000	-0.000	0.000**
	(0.000)	(0.000)	(0.012)	(0.000)	(0.000)	(0.070)	(0.000)	(0.017)	(0.000)	(0.000)	(0.000)	(0.000)
Male	-0.079**	-0.145	15.421	0.059*	0.125**	326.950	-0.001	27.261	-0.025	-0.007	0.013	-0.016
	(0.040)	(0.159)	(55.569)	(0.031)	(0.049)	(238.652)	(0.052)	(28.696)	(0.050)	(0.027)	(0.021)	(0.099)
Partner	0.013	0.142***	18.042	0.009	0.017	2.166	0.009	-2.325	0.052*	-0.015	0.005	-0.021
	(0.021)	(0.049)	(21.558)	(0.017)	(0.027)	(149.531)	(0.027)	(15.863)	(0.028)	(0.015)	(0.011)	(0.053)
Middle education	-0.018	-0.177**	-37.807	-0.025	-0.056*	-208.508	-0.020	-4.203	0.109***	-0.022	-0.015	-0.137***
	(0.020)	(0.088)	(31.651)	(0.018)	(0.031)	(159.223)	(0.027)	(16.035)	(0.026)	(0.014)	(0.011)	(0.051)
High Education	-0.028	-0.255***	-46.692*	-0.043**	-0.087**	-296.568**	-0.053	9.297	0.301***	-0.042**	-0.025**	-0.367***
	(0.026)	(0.084)	(27.474)	(0.022)	(0.035)	(133.579)	(0.036)	(24.334)	(0.032)	(0.018)	(0.012)	(0.068)
Constant	-0.829	8.606	-1,314.050	-1.732	-3.576	7,200.517	-1.925	-8,128.286***	3.950	-1.940	0.167	-15.439*
	(3.099)	(8.969)	(2,210.439)	(2.401)	(3.855)	(11,681.496)	(4.210)	(2,726.937)	(3.850)	(2.095)	(1.359)	(8.181)
Observations	3,528	3,528	3,542	3,541	3,541	3,542	3,530	3,542	3,542	3,542	3,542	3,078
R-squared	0.014	0.007		0.020	0.018	0.003			0.028	0.003		0.028

Note:*Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses show robust standard errors clustered at the person level.

Table A.6: Parametric RD Estimation with Restricted Sample (±10 yrs)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	Outpatient incidence	#Dr. visits	Outpatient cost	Inpatient incidence	# Hospital stays	Inpatient cost	Self-treatment incidence	Self-treatment cost	Health check incidence	Forgone outpatient incidence	Forgone inpatient incidence	Self-reported health
Retirement	0.036	0.242	122.235	0.119	0.346**	1,425.696**	0.119	214.480***	-0.028	0.017	0.083	0.166
	(0.121)	(0.372)	(220.788)	(0.099)	(0.157)	(693.242)	(0.174)	(79.955)	(0.160)	(0.087)	(0.067)	(0.305)
Retirement × Normalized age	-0.011	0.007	-77.074	-0.003	0.021	332.754	-0.122**	-22.786	0.025	-0.003	0.020	-0.235**
	(0.038)	(0.106)	(59.463)	(0.031)	(0.052)	(253.434)	(0.056)	(27.882)	(0.052)	(0.028)	(0.020)	(0.119)
Retirement × (Normalized age)^2	-0.001	-0.003	-0.490	0.000	0.004	20.833	-0.002	1.552	0.000	0.001	0.000	-0.005
	(0.002)	(0.006)	(3.321)	(0.002)	(0.003)	(13.478)	(0.003)	(1.644)	(0.003)	(0.002)	(0.001)	(0.005)
Normalized age	0.014	0.013	30.172	-0.000	-0.028	-258.201**	0.063*	-0.072	-0.008	-0.002	-0.011	0.128*
	(0.021)	(0.051)	(25.581)	(0.017)	(0.025)	(125.746)	(0.033)	(14.113)	(0.031)	(0.017)	(0.011)	(0.065)
(Normalized age)^2	0.001	0.001	2.765	-0.000	-0.002	-21.049*	0.006**	0.475	-0.001	0.000	-0.001	0.011*
	(0.002)	(0.004)	(1.989)	(0.001)	(0.002)	(10.861)	(0.003)	(1.247)	(0.003)	(0.001)	(0.001)	(0.006)
Male	-0.048***	-0.105*	-47.027**	0.045***	0.082***	129.735	-0.029	-15.675	0.007	-0.014	-0.004	0.019
	(0.018)	(0.058)	(19.898)	(0.014)	(0.026)	(127.743)	(0.027)	(13.866)	(0.023)	(0.012)	(0.011)	(0.050)
Partner	0.012	0.140***	18.876	0.009	0.020	3.358	0.016	0.311	0.054**	-0.013	0.004	-0.007
	(0.021)	(0.049)	(24.045)	(0.017)	(0.029)	(169.000)	(0.032)	(16.471)	(0.027)	(0.015)	(0.011)	(0.066)
Middle education	0.003	-0.157	14.472	-0.023	-0.099*	-617.584**	0.081	-0.761	0.092	-0.026	-0.026	0.031
	(0.041)	(0.121)	(56.309)	(0.033)	(0.052)	(252.994)	(0.062)	(26.476)	(0.056)	(0.031)	(0.021)	(0.107)
High education	-0.007	-0.246*	24.597	-0.037	-0.120*	-743.349**	0.083	26.109	0.283***	-0.043	-0.043*	-0.159
	(0.047)	(0.128)	(51.349)	(0.039)	(0.062)	(299.639)	(0.073)	(36.562)	(0.065)	(0.037)	(0.023)	(0.130)
Constant	0.173***	0.326**	32.507	0.045	0.011	-75.654	0.487***	14.147	0.461***	0.108***	0.021	3.626***
	(0.041)	(0.127)	(64.135)	(0.032)	(0.052)	(191.036)	(0.059)	(31.702)	(0.052)	(0.028)	(0.021)	(0.113)
Observations	3,528	3,528	3,542	3,541	3,541	3,542	3,530	3,542	3,542	3,542	3,542	3,078

Note:*Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses show robust standard errors clustered at the person level.

Table A.7: Nonparametric Fuzzy RD Estimates of Retirement Effect $\hat{\tau}$ by Gender

Dependent variable	Male		Female		Test if coefficients are equal	
	Convent.	Robust	Convent.	Robust	H_0: (1)=(3)	H_0: (2)=(4)
	(1)	(2)	(3)	(4)	P-value	P-value
Outpatient incidence	0.380*	0.392*	-0.298	-0.526	0.213	0.219
	(0.201)	(0.227)	(0.506)	(0.712)		
# Doctor visits	1.162**	1.140*	0.829***	0.900***	0.552	0.702
	(0.532)	(0.592)	(0.176)	(0.207)		
Outpatient cost	529.88*	578.11	-1523	-2469.7	0.154	0.103
	(299.13)	(358.5)	(1410.3)	(1834)		
Inpatient incidence	0.103	0.142	0.204*	0.158	0.625	0.948
	(0.174)	(0.214)	(0.111)	(0.120)		
# Hospital stays	0.411	0.437	0.416	0.493	0.993	0.939
	(0.283)	(0.330)	(0.485)	(0.659)		
Inpatient cost	1925.7**	1741.9*	824.61	1227.7	0.305	0.675
	(805.45)	(897.69)	(709.59)	(838.04)		
Self-treatment incidence	0.048	-0.035	1.531	2.562	0.377	0.259
	(0.303)	(0.353)	(1.650)	(2.213)		
Self-treatment cost	75.08	68.069	481.8	607.12	0.322	0.274
	(92.86)	(108.09)	(399.95)	(480.68)		
Health check incidence	0.150	0.093	-0.167	-0.126	0.263	0.527
	(0.253)	(0.317)	(0.127)	(0.139)		
Forgone outpatient incidence	0.022	0.011	0.049	0.049	0.844	0.816
	(0.115)	(0.145)	(0.075)	(0.075)		
Forgone inpatient incidence	0.028	0.045	0.192	0.292	0.429	0.326
	(0.071)	(0.082)	(0.195)	(0.238)		
Self-reported health	0.104	0.087	0.245	0.448**	0.799	0.586
	(0.499)	(0.623)	(0.237)	(0.227)		
Residualized	Yes		Yes			
Observations	2,851		2,327			

Notes:*Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses show robust standard errors clustered at the person level. "Convent." refers to estimates using conventional coefficient and variance estimators, and "Robust" refers to estimates using bias-corrected coefficient estimators and robust variance estimators. In columns (3) and (4), we use a common bandwidth for the regions on both sides of the cutoff point in the estimation of "# hospital stays", "self-treatment incidence", "inpatient incidence", and "forgone outpatient incidence". We do not residualize outcome variable in the estimation of "# doctor visits" and "inpatient incidence". And we use heteroskedasticity-robust nearest neighbor variance estimator in the estimation of "forgone outpatient incidence". Columns (5) and (6) report the one-sided P-value from X^2 distribution with degree of freedom one. For "residualized" outcome variables, we regress outcome variables on age polynomials (age, age2, and age3), binary variables for male, having a partner, having mid-education, and having high education, and then conduct the nonparametric RD analysis described above based on the residuals.

Table A.8: Potential Discontinuities in Other Variables

Dependent variable	Nonparametric RD	
	Conventional	Robust
Pension	-0.168	-0.241
	(0.205)	(0.259)
Health insurance	-0.064	-0.074
	(0.088)	(0.110)
Urban employee medical insurance	-0.016	-0.020
	(0.198)	(0.240)
Urban resident medical insurance	0.080	0.130
	(0.145)	(0.175)
New cooperative medical insurance	-0.082	-0.108
	(0.120)	(0.146)
Urban & rural resident medical insurance	0.024	0.026
	(0.046)	(0.056)
Government medical insurance	0.127	0.130
	(0.082)	(0.099)
Medical aid	-0.023	-0.027
	(0.038)	(0.046)
Private medical insurance (employer)	-0.019	-0.018
	(0.057)	(0.071)
Private medical insurance (employee)	-0.011	0.013
	(0.090)	(0.112)
Urban non-employed health insurance	0.032	0.038
	(0.021)	(0.024)
Other medical insurance	-0.026	-0.032
	(0.043)	(0.053)
No insurance	0.090	0.110
	(0.085)	(0.106)
Residualized	No	
Observations	5,178	

Notes: Numbers in parentheses show robust standard errors clustered at the person level. “Conventional” refers to estimates using conventional coefficient and variance estimators, and “Robust” refers to estimates using bias-corrected coefficient estimators and robust variance estimators.

Table A.9: Potential Discontinuities at SRAs for Working Individuals

Dependent variable	Working individuals	
	Conventional	Robust
Outpatient incidence	0.046	0.059
	(0.068)	(0.083)
# Doctor visits	0.241	0.303
	(0.192)	(0.236)
Outpatient cost	-12.371	-13.544
	(41.461)	(51.635)
Inpatient incidence	0.003	0.017
	(0.047)	(0.058)
# Hospital stays	0.017	0.040
	(0.062)	(0.076)
Inpatient cost	78.509	90.81
	(58.455)	(101.44)
Self-treatment incidence	0.034	0.036
	(0.069)	(0.081)
Self-treatment cost	0.767	-5.108
	(25.871)	(31.369)
Health check incidence	-0.066	-0.068
	(0.072)	(0.089)
Forgone outpatient incidence	0.050	0.052
	(0.037)	(0.044)
Forgone inpatient incidence	0.045*	0.050
	(0.027)	(0.033)
Self-reported health	-0.180	-0.203
	(0.126)	(0.150)
log(1+annual income)	-0.149	-0.181
	(0.142)	(0.168)
Hours of working / year	74.22	159.16
	(198.33)	(234)
Residualized	Yes	
Observations	2,445	

Notes: Numbers in parentheses show robust standard errors clustered at the person level. “Conventional” refers to estimates using conventional coefficient and variance estimators, and “Robust” refers to estimates using bias-corrected coefficient estimators and robust variance estimators. For “residualized” outcome variables, we regress outcome variables on age polynomials (age, age2, and age3), binary variables for male, having a partner, having mid-education, and having high education, and then conduct the nonparametric RD analysis described above based on the residuals.

Table A.10: Nonparametric Estimates with Different Bandwidths

Dependent variable	b = 8		b = 6		b = 4	
	Convent.	Robust	Convent.	Robust	Convent.	Robust
	(1)	(2)	(3)	(4)	(5)	(6)
Outpatient incidence	0.046	0.045	0.041	0.099	0.083	0.334
	(0.100)	(0.159)	(0.117)	(0.206)	(0.160)	(0.402)
# Doctor visits	0.281	0.425	0.284	0.720	0.534	2.089
	(0.312)	(0.366)	(0.325)	(0.501)	(0.382)	(1.396)
Outpatient cost	87.946	54.834	84.166	65.89	107.2	-23.151
	(178.26)	(290.81)	(222)	(362.1)	(308.65)	(522.74)
Inpatient incidence	0.116	0.208	0.154	0.233	0.188	0.109
	(0.082)	(0.133)	(0.098)	(0.173)	(0.137)	(0.323)
# Hospital stays	0.312**	0.502***	0.393***	0.508**	0.470**	0.330
	(0.128)	(0.187)	(0.148)	(0.253)	(0.204)	(0.459)
Inpatient cost	1312**	1651.1***	1463.8***	1494*	1720.7***	985.32
	(520.35)	(614.38)	(524.29)	(841.73)	(646.92)	(1301.5)
Self-treatment incidence	0.109	0.069	0.104	0.158	0.088	0.879
	(0.141)	(0.225)	(0.166)	(0.289)	(0.226)	(0.585)
Self-treatment cost	176.23***	148.43	156.9**	176.29	137.18	205.42
	(60.907)	(94.142)	(69.279)	(109.43)	(87.292)	(213.41)
Health check incidence	0.020	0.064	0.059	-0.124	-0.019	0.036
	(0.137)	(0.217)	(0.161)	(0.279)	(0.215)	(0.549)
Forgone outpatient incidence	0.026	0.021	0.028	0.018	0.004	0.059
	(0.072)	(0.120)	(0.086)	(0.153)	(0.119)	(0.296)
Forgone inpatient incidence	0.088*	0.087	0.088	0.081	0.098	0.210
	(0.053)	(0.079)	(0.061)	(0.101)	(0.081)	(0.193)
Self-reported health	0.134	0.056	0.120	0.116	0.192	-0.823
	(0.257)	(0.416)	(0.296)	(0.531)	(0.415)	(1.061)
Residualized	Yes		Yes		Yes	
Observations	5,178		5,178		5,178	

Notes:*Significant at 10%; ** at 5%; *** at 1%. The model and estimation method are the same as in columns (2) and (3) of Table 4. We use a common bandwidth b for the regions on both sides of the cutoff point. For "residualized" outcome variables, we regress outcome variables on age polynomials (age, age2, and age3), binary variables for male, having a partner, having mid-education, and having high education, and then conduct the nonparametric RD analysis described above based on the residuals.

Table A.11: "Donut Hole" Regression Discontinuity Design

Dependent variable	Parametric RD			Nonparametric RD	
	Omitted ages: a=0	Omitted ages: a=-1, 0, 1	Omitted ages: a=-2, -1, 0, 1, 2	Omitted ages: a = 0	
				Conventional	Robust
	(1)	(2)	(3)	(4)	(5)
Outpatient incidence	0.089	0.071	0.107	0.127	0.122
	(0.086)	(0.111)	(0.144)	(0.148)	(0.180)
# Doctor visits	0.438	0.356	0.382	0.852*	0.897
	(0.318)	(0.452)	(0.426)	(0.478)	(0.565)
Outpatient cost	48.536	174.881*	239.549*	-199.33	-266.74
	(87.272)	(94.601)	(137.399)	(193.26)	(231.4)
Inpatient incidence	0.121*	0.064	0.071	0.194	0.229
	(0.069)	(0.083)	(0.113)	(0.125)	(0.153)
# Hospital stays	0.246**	0.099	0.030	0.566**	0.667**
	(0.119)	(0.149)	(0.207)	(0.270)	(0.314)
Inpatient cost	844.174*	-236.441	-645.628	3421**	3956.9**
	(495.762)	(476.386)	(821.740)	(1607.5)	(1837.3)
Self-treatment incidence	0.132	0.140	0.313	0.115	0.118
	(0.111)	(0.132)	(0.197)	(0.197)	(0.238)
Self-treatment cost	197.571***	180.039**	241.556*	222.31**	244.36**
	(64.967)	(85.634)	(130.252)	(92.793)	(110.32)
Health check incidence	-0.091	-0.128	-0.185	-0.074	-0.071
	(0.107)	(0.131)	(0.180)	(0.184)	(0.225)
Forgone outpatient incidence	-0.032	-0.052	-0.105	-0.0003	-0.001
	(0.057)	(0.069)	(0.091)	(0.098)	(0.119)
Forgone inpatient incidence	0.094**	0.113**	0.157**	0.040	0.021
	(0.042)	(0.051)	(0.067)	(0.068)	(0.081)
Self-reported health	0.143	0.284	0.431	-0.019	-0.053
	(0.223)	(0.277)	(0.410)	(0.362)	(0.447)
Covariates		Yes		Residualized	
Observations	4,972	4,557	4,165	4,972	

Notes: *Significant at 10%; ** at 5%; *** at 1%. The "omitted ages" is the "donut hole" which specifies the region of observations that we drop for a donut hole RD design. For example, "a= -1, 0, 1" means that we drop observations with normalized age -1, 0, and 1. In columns (1) to (3), we use the same model specification as in column (2) of Table 7. Numbers in parentheses show robust standard errors clustered at the person level. In columns (4) and (5), the model specification is the same as in columns (2) and (3) of Table 4. Covariates refer to age polynomials (age, age2, and age3), binary variables for male, having a partner, having mid-education, and having high education. For "residualized" outcome variables, we regress outcome variables on the covariates, and then conduct the nonparametric RD analysis described above based on the residuals.

Table A.12: Summary Statistics on Additional Variables

Variable	Obs.	Mean	Std. dev.
Dentist visit incidence	2682	0.224	0.417
# Dentist visits	2670	0.570	1.675
Dental cost	2596	165.129	696.123
Mortality	5178	0.007	0.081
Preventive outpatient care incidence	5178	0.018	0.134

Table A.13: Summary Statistics of Reasons for Self-treatment

N=5178 Std. dev in "()"	Average cost (yuan)	Average cost (yuan) conditional on cost>0	Obs. of positive cost
1. Consumed over-the-counter modern medicines	60.243	217.682 (410.367)	1433
2. Consumed prescription medicines	42.028	334.291 (509.761)	651
3. Consumed traditional herbs or traditional medicines as treatment	41.996	453.980 (669.756)	479
4. Tonic/Health supplement	36.458	477.919 (738.355)	395
5. Use health care equipment	13.927	707.005 (846.543)	102
6. Other	41.968	462.139 (557.684)	18

Table A.14: The Effect of Retirement on Additional Variables

Dependent variable	Mechanisms	
	Conventional	Robust
Dentist visit incidence	-0.081	-0.060
	(0.204)	(0.251)
# Dentist visits	-0.194	0.119
	(0.707)	(0.859)
Dental cost	-621.09	-749.12
	(478.86)	(582.5)
Mortality	0.022**	0.025**
	(0.010)	(0.011)
Preventive outpatient care incidence	0.029	0.029
	(0.041)	(0.049)
Self-treatment cost – OTC medicine	137.97**	142.9*
	(62.431)	(75.472)
Self-treatment cost – Prescribed medicine	-21.276	-28.707
	(49.703)	(60.868)
Self-treatment cost – Tradition herbs	54.585	52.686
	(64.941)	(80.103)
Self-treatment cost – Supplement	96.941*	100.82
	(55.471)	(64.924)
Self-treatment cost – Equipment	70.966	85.381
	(52.271)	(62.165)
Self-treatment cost – Other	-8.593	-15.345*
	(6.504)	(8.440)
Residualized	No	
Observations	5,178 (2,682 for dental variables)	

Notes:*Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses are robust standard errors clustered at the person level. "Conventional" refers to estimates using conventional coefficient and variance estimators, and "Robust" refers to estimates using bias-corrected coefficient estimators and robust variance estimators.

Table A.15: IV Fixed Effects Estimation and Using Early Retirement Ages as IV

Dependent variable	IV-FE		Parametric RD 1	Over-identifying restrictions test	Parametric RD 1- Male	Parametric RD 1 - Female
	(1)	(2)	(3)	P-value	(4)	(5)
Outpatient incidence	0.245	0.235	0.094	0.751	0.059	0.077
	(0.313)	(0.324)	(0.081)		(0.119)	(0.229)
# Doctor visits	1.205	1.240	0.339	0.875	0.521	-0.140
	(0.918)	(0.970)	(0.283)		(0.463)	(0.709)
Outpatient cost	392.290	382.587	151.095	0.361	422.845	-271.792
	(502.342)	(525.170)	(109.275)		(284.235)	(288.600)
Inpatient incidence	0.407	0.407	0.125*	0.364	0.090	0.144
	(0.273)	(0.281)	(0.066)		(0.120)	(0.148)
# Hospital stays	0.850*	0.813	0.233**	0.107	0.365	0.160
	(0.493)	(0.501)	(0.104)		(0.224)	(0.182)
Inpatient cost	2,817.574	2,819.489	552.870	0.859	1,365.368	91.622
	(2,481.019)	(2,530.206)	(445.942)		(1,000.655)	(737.963)
Self-treatment incidence	-0.017	-0.038	0.254**	0.980	0.162	0.336
	(0.396)	(0.406)	(0.110)		(0.175)	(0.292)
Self-treatment cost	51.118	37.929	179.533***	0.675	182.578**	362.687**
	(280.722)	(282.275)	(62.142)		(89.436)	(167.998)
Health check incidence	-0.053	-0.072	-0.029	0.513	0.128	-0.424
	(0.358)	(0.369)	(0.105)		(0.167)	(0.277)
Forgone outpatient incidence	0.121	0.155	-0.006	0.523	0.000	0.018
	(0.241)	(0.250)	(0.056)		(0.085)	(0.157)
Forgone inpatient incidence	0.301	0.307	0.084**	0.684	0.018	0.142
	(0.191)	(0.198)	(0.044)		(0.069)	(0.131)
Self-reported health	0.912	1.014	0.380*	0.984	0.165	0.522
	(0.830)	(0.873)	(0.205)		(0.324)	(0.464)
First-stage estimates of IV:						
≥ full retirement ages	0.151***	0.148***	0.301***		0.329***	0.219***
	(0.045)	(0.045)	(0.031)		(0.053)	(0.055)
≥ early retirement ages			-0.011		0.032	-0.018
			(0.025)		(0.044)	(0.051)
Covariates	Yes	Yes	Yes		Yes	Yes
Age polynomial	2	3	3		3	3
Observations	3,334	3,334	3,542		2,050	1,492

Notes:*Significant at 10%; ** at 5%; *** at 1%. Numbers in parentheses show robust standard errors clustered at the person level. Column (1) control for age polynomials up to the second degree (age, age^2), and column (2) up to the third degree (age, age^2 and age^3). Similar to column (1) of Table 7, we use the indicator of being at or above the SRA as the instrumental variable for retirement. Column (3) to (5) have the same specification as column (1) of Table 7 (±10 years) except for the instrumental variables. Besides the dummy variable being above full retirement ages, we include an extra instrument variable being above early retirement ages. The column next to column (3) show the P-value for the test of over-identifying restrictions. Column (4) and (5) are separate estimates for men and women. Covariates refer to age polynomials (age, age2, and age3), binary variables for male, having a partner, having mid-education, and having high education.

Appendix B: Figures

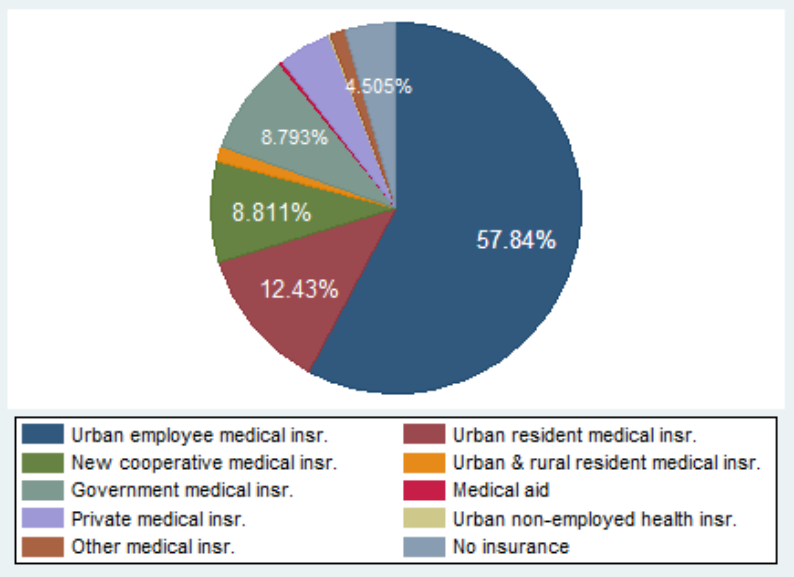


Figure B.1: Health Insurance Coverage by Type of Insurance

(Source: own calculations from our sample)

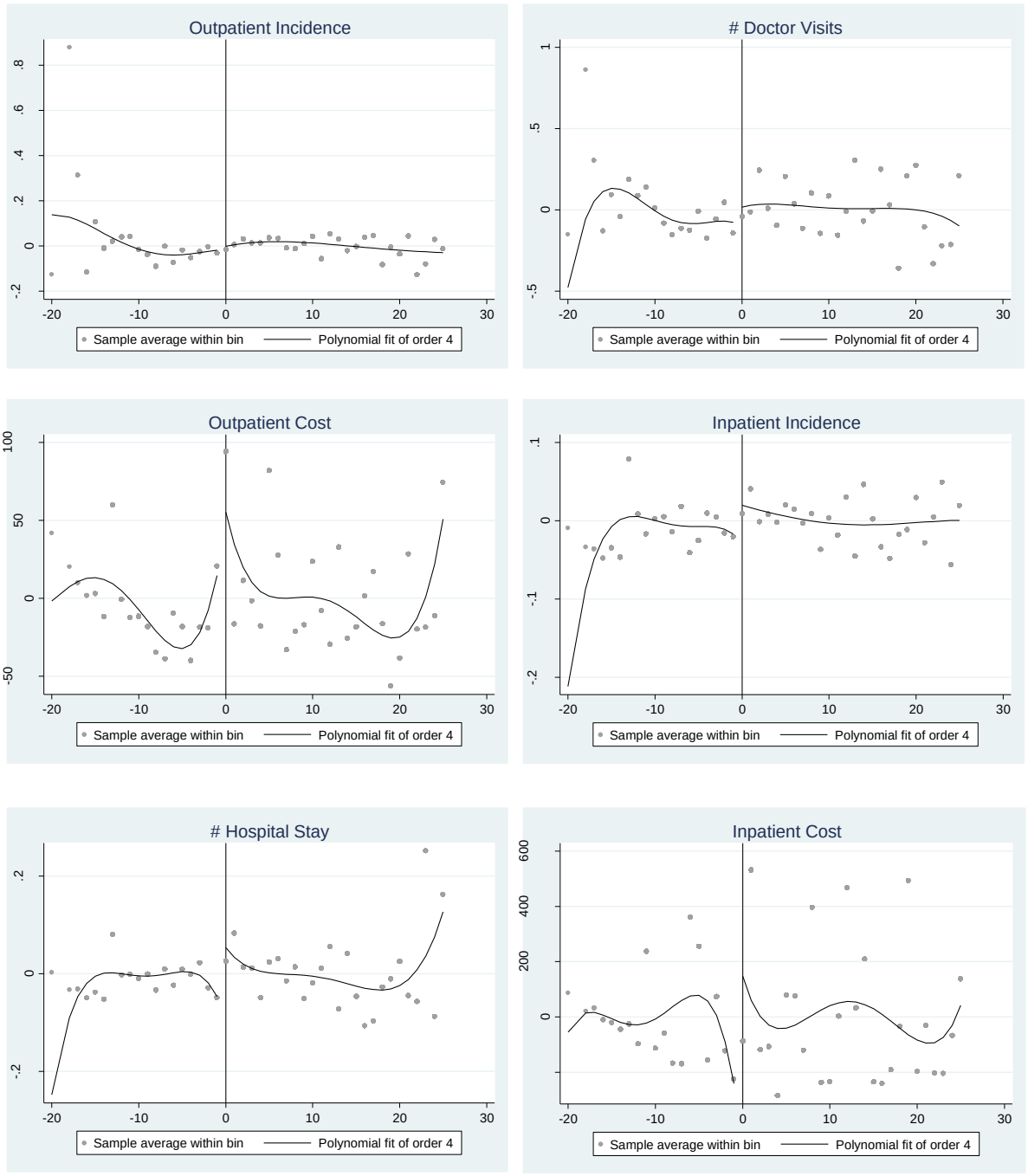


Figure B.2: RD Plots of Residualized Outcome Variables by Normalized Age[1]

[1] We use a uniform kernel to construct local-polynomial estimators, assuming equal weights for all observations.

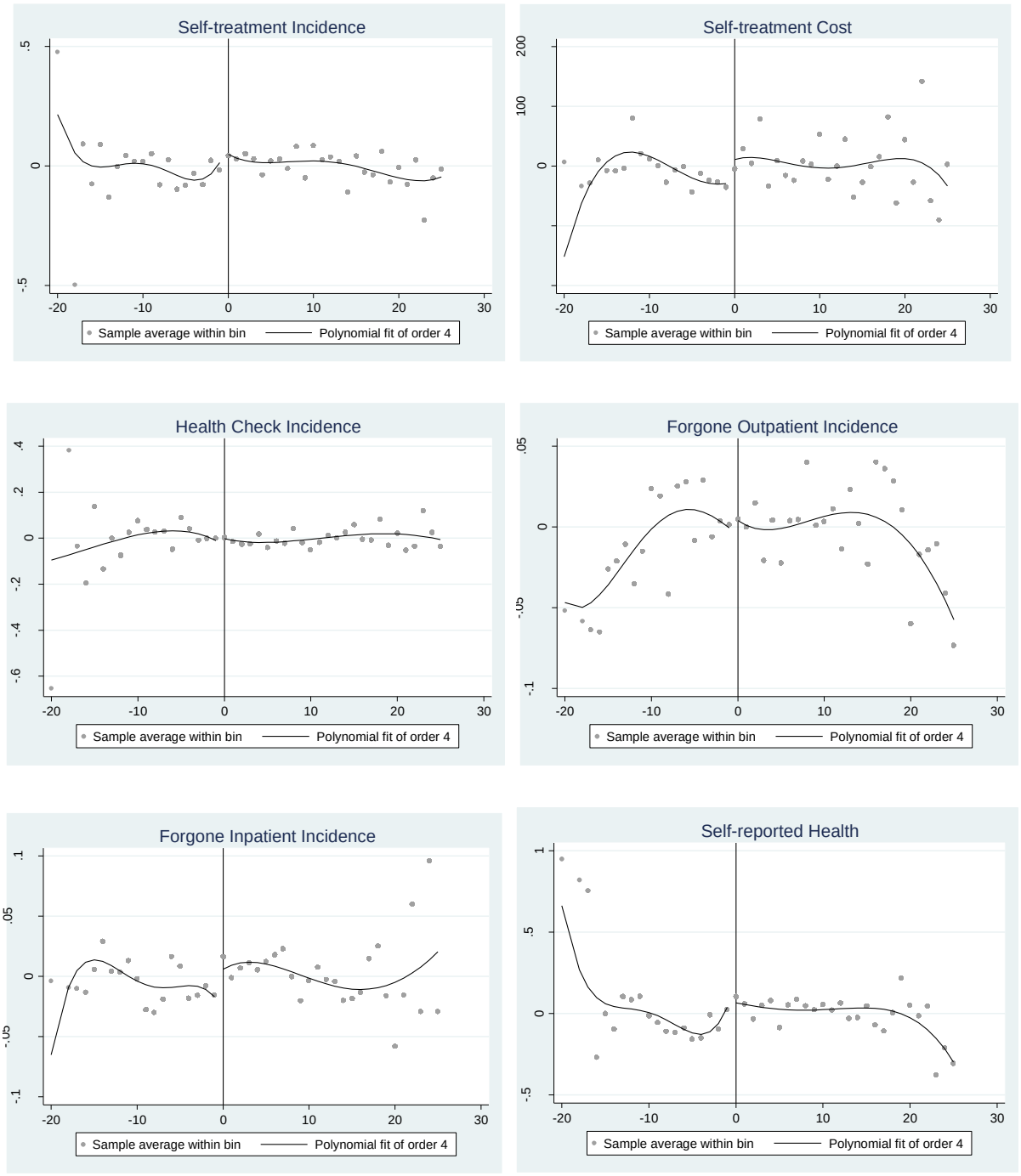


Figure B.2: (Continued)

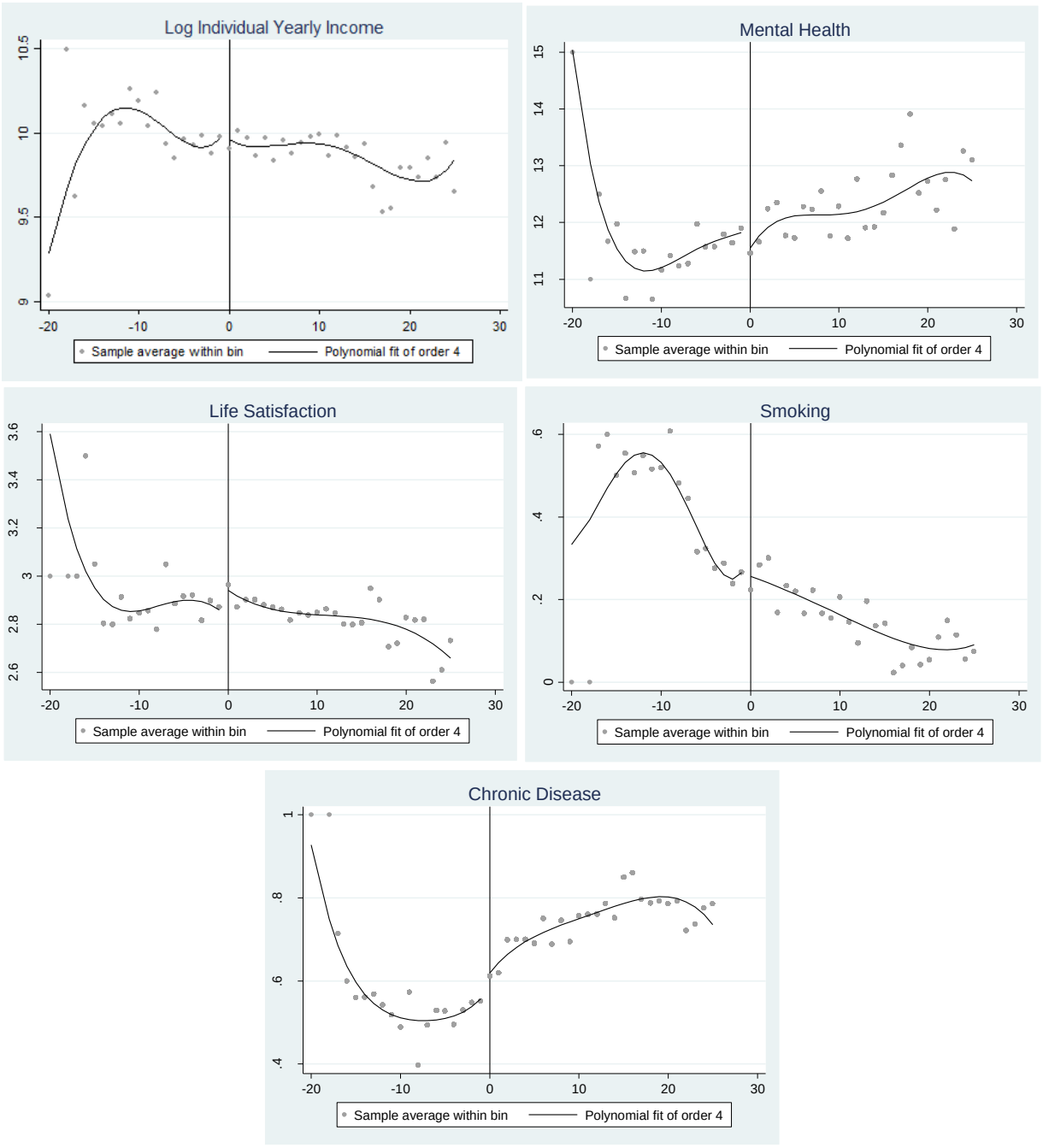


Figure B.3: RD Plots of Mechanism Variables by Normalized Age

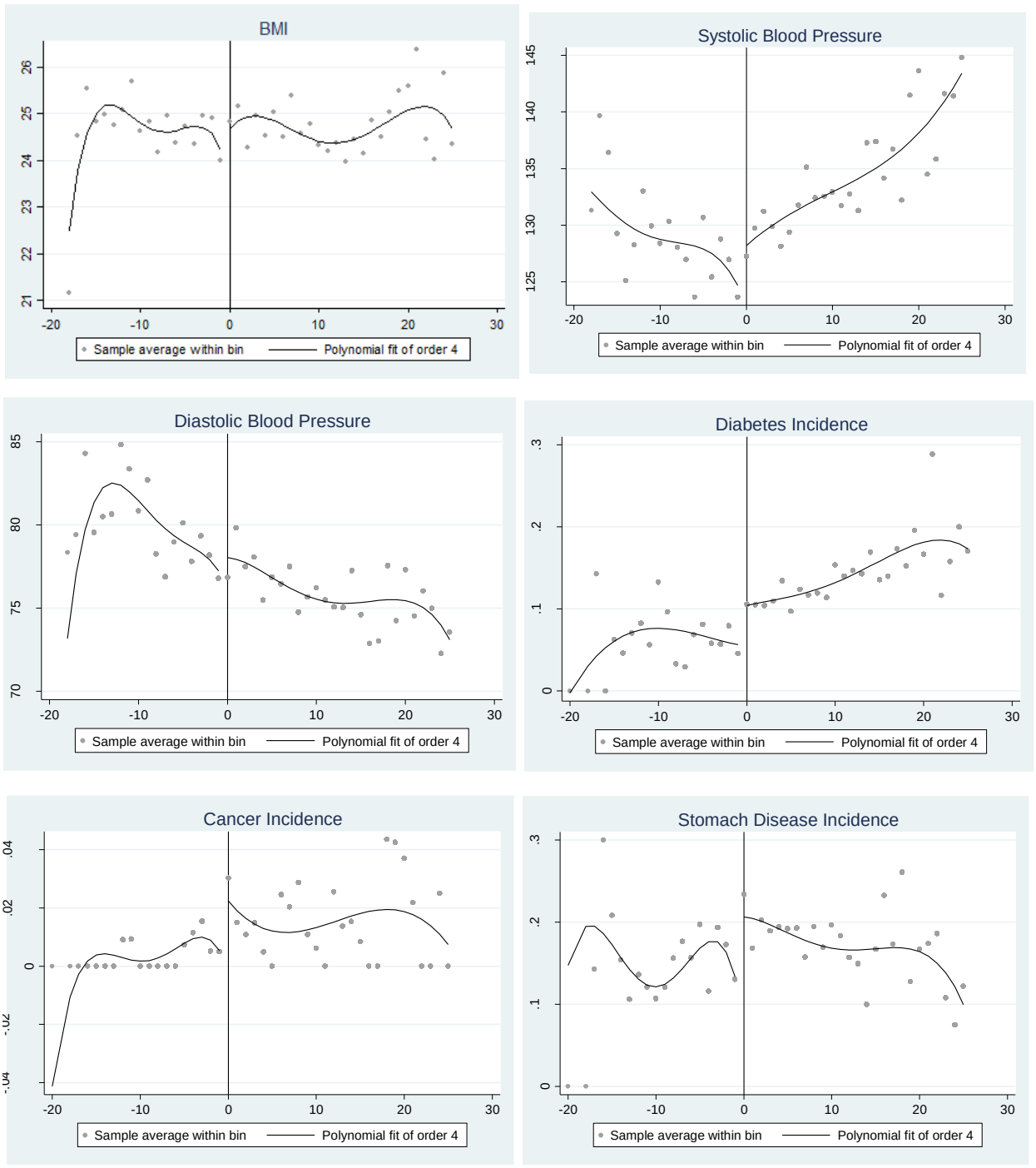


Figure B.3: (Continued)

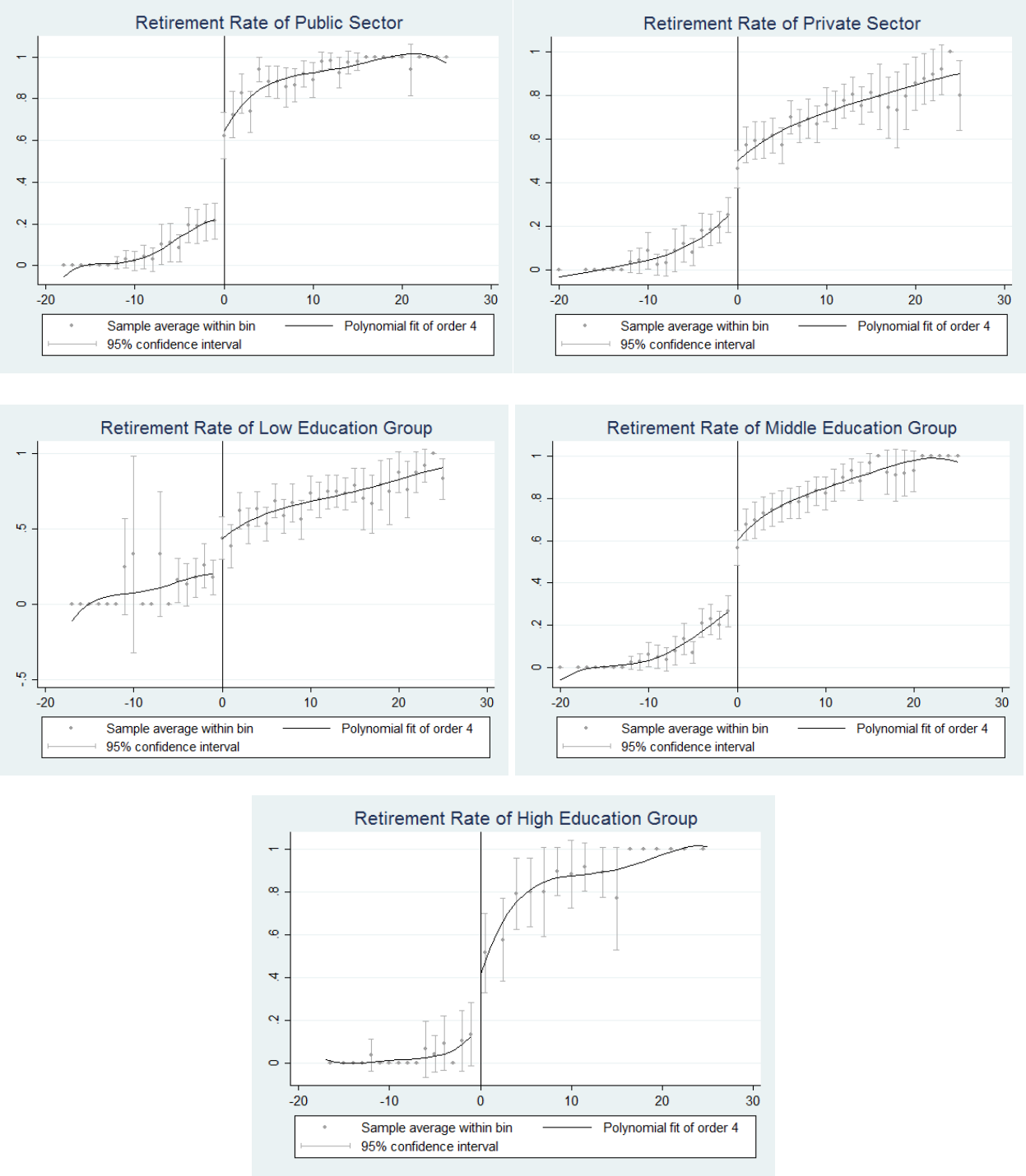
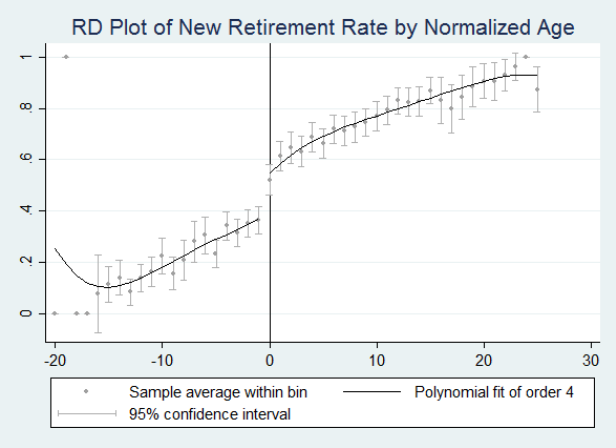
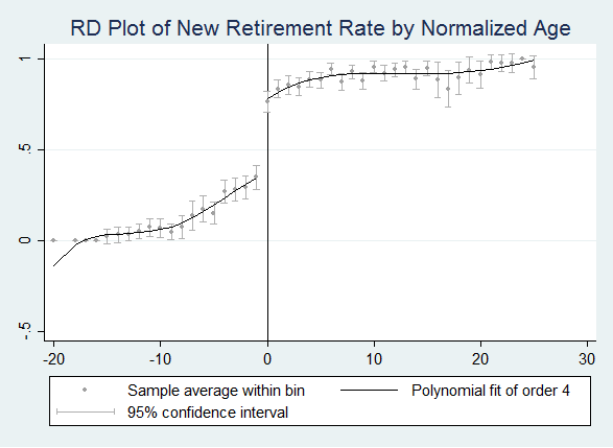


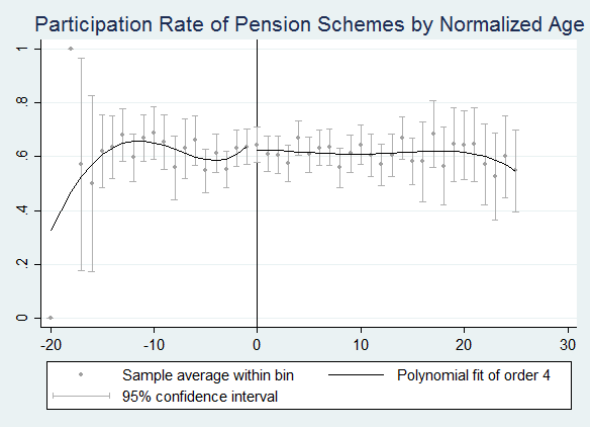
Figure B.4: RD Plot of the First Stage by Sectors and Education Groups





(A) Stop Working **(B) Processed Retirement**

Figure B.5: Retirement Rate for Alternative Definition of Retirement by Normalized Age



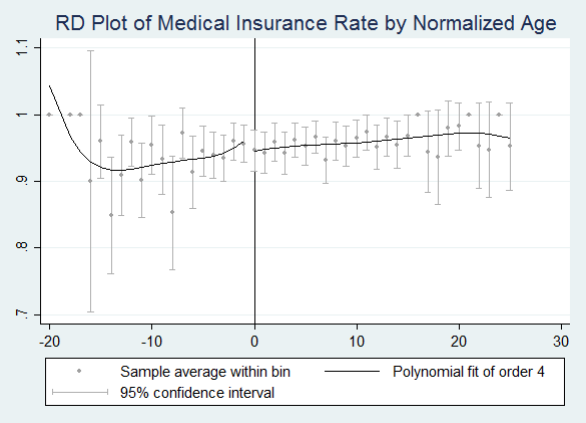


Figure B.6: RD Plots of Pension and Health Insurance Coverage

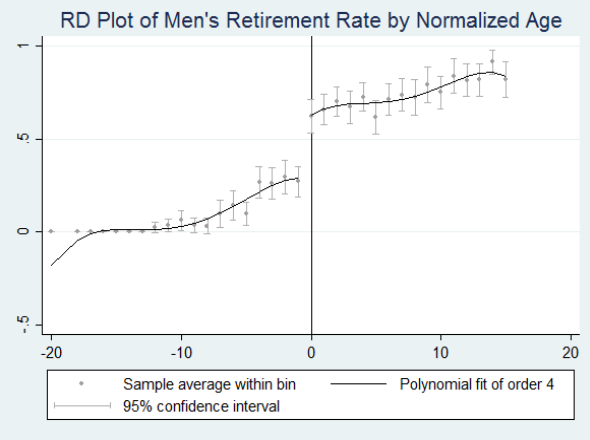


Figure B.7: RD Plots of Retirement Rate by Gender

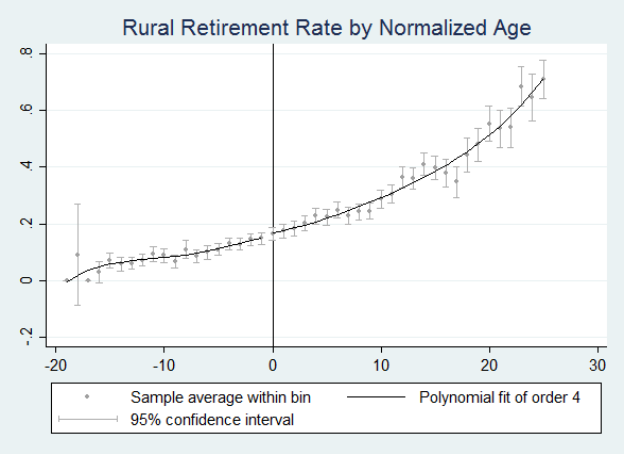


Figure B.8 Retirement (Stop Working) Rate of Rural Population

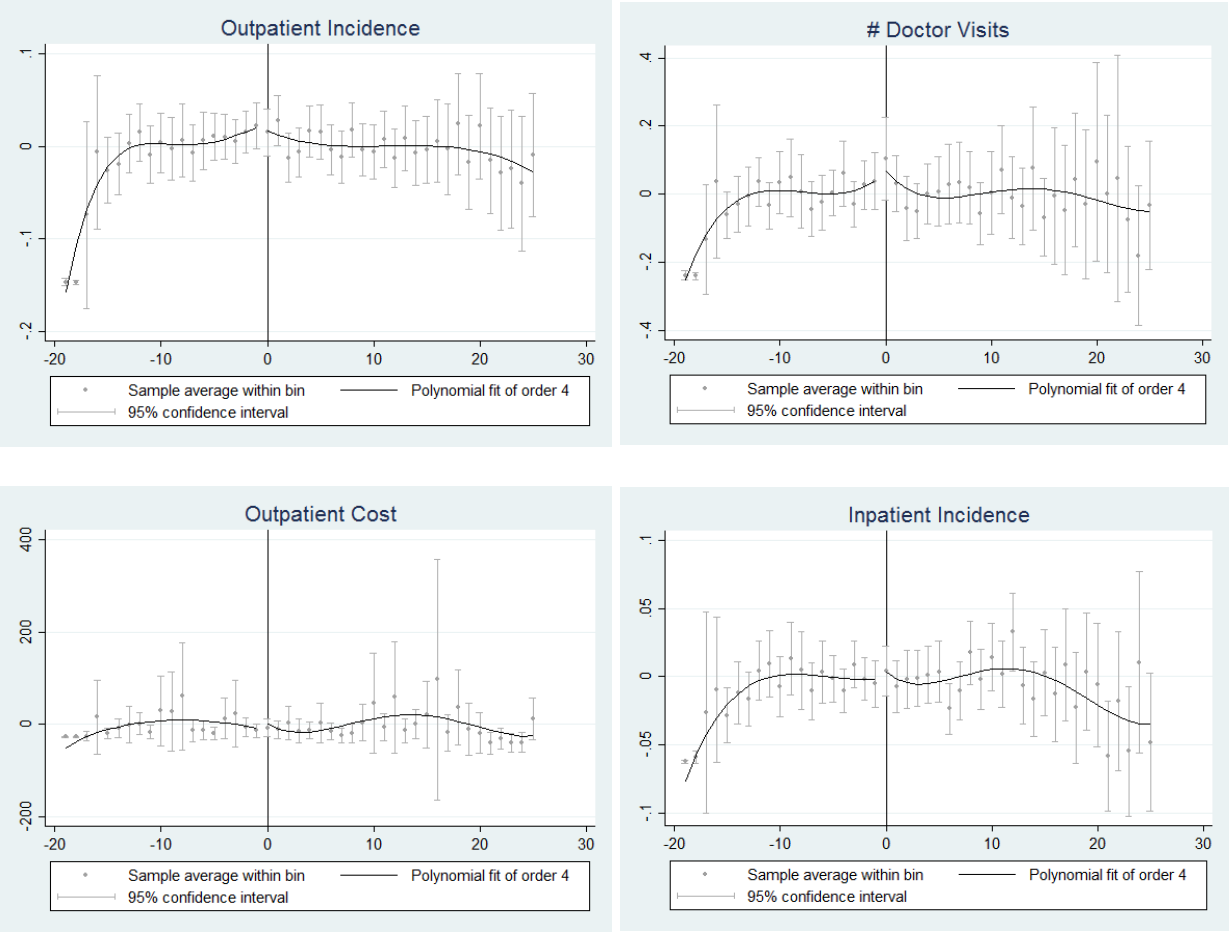


Figure B.9: Health Utilization by Normalized Age of Rural Population

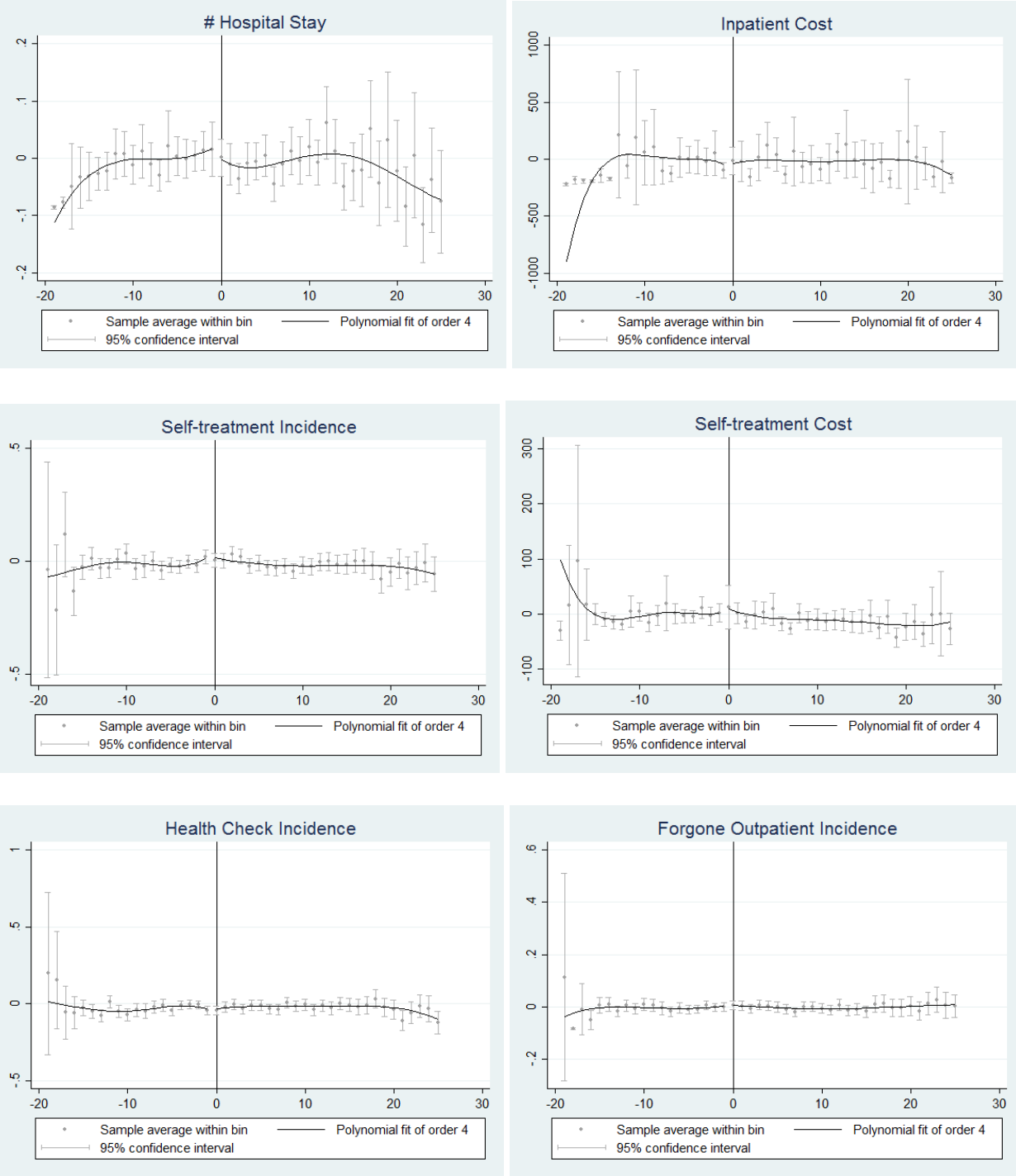
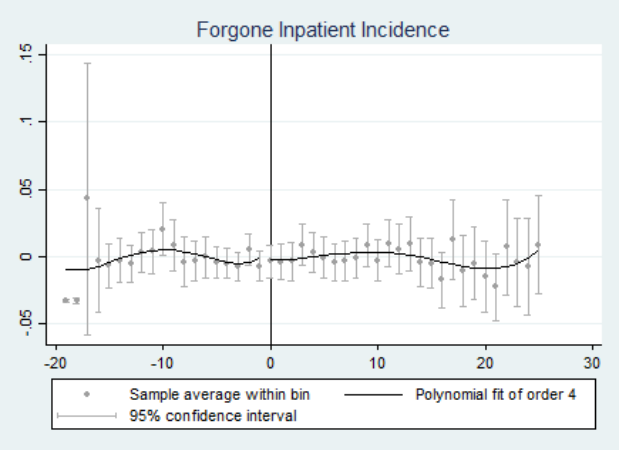


Figure B.9: (Continued)



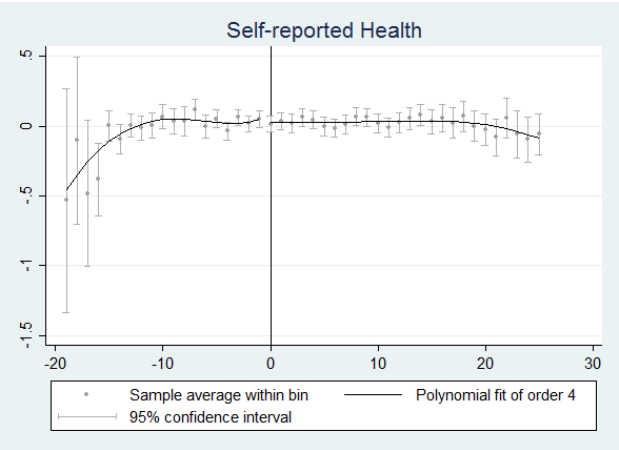
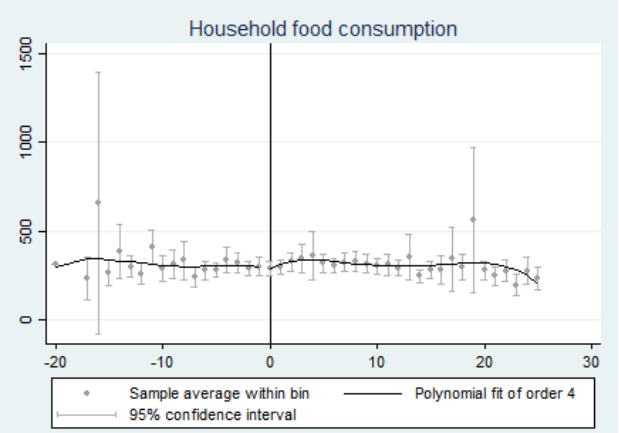
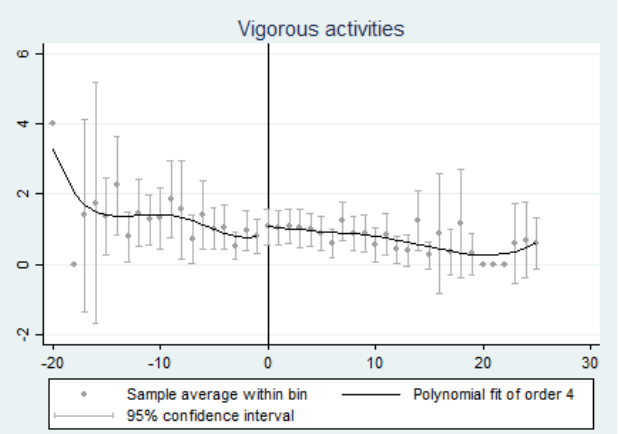
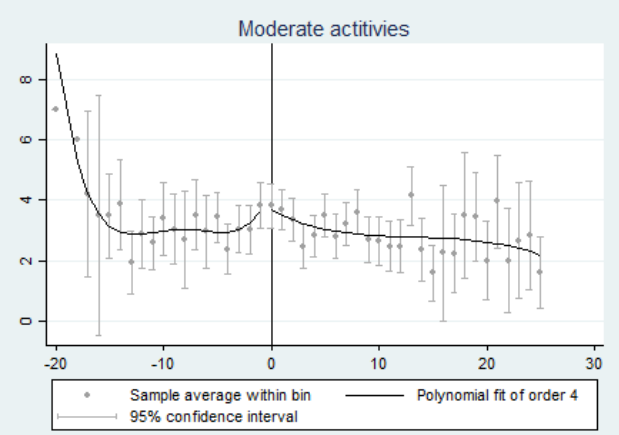


Figure B.9: (Continued)







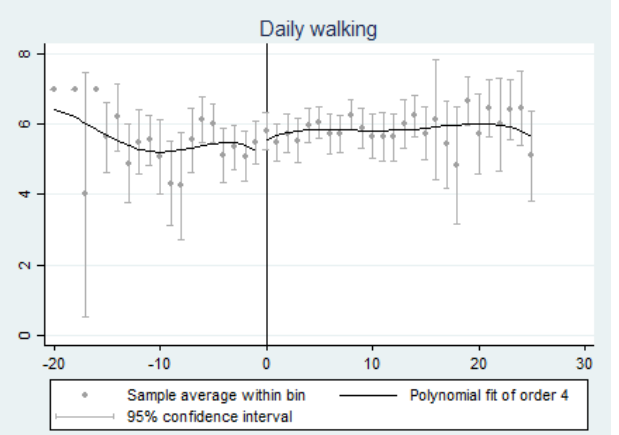


Figure B.10: Food Consumption and Physical Activities by Normalized Age

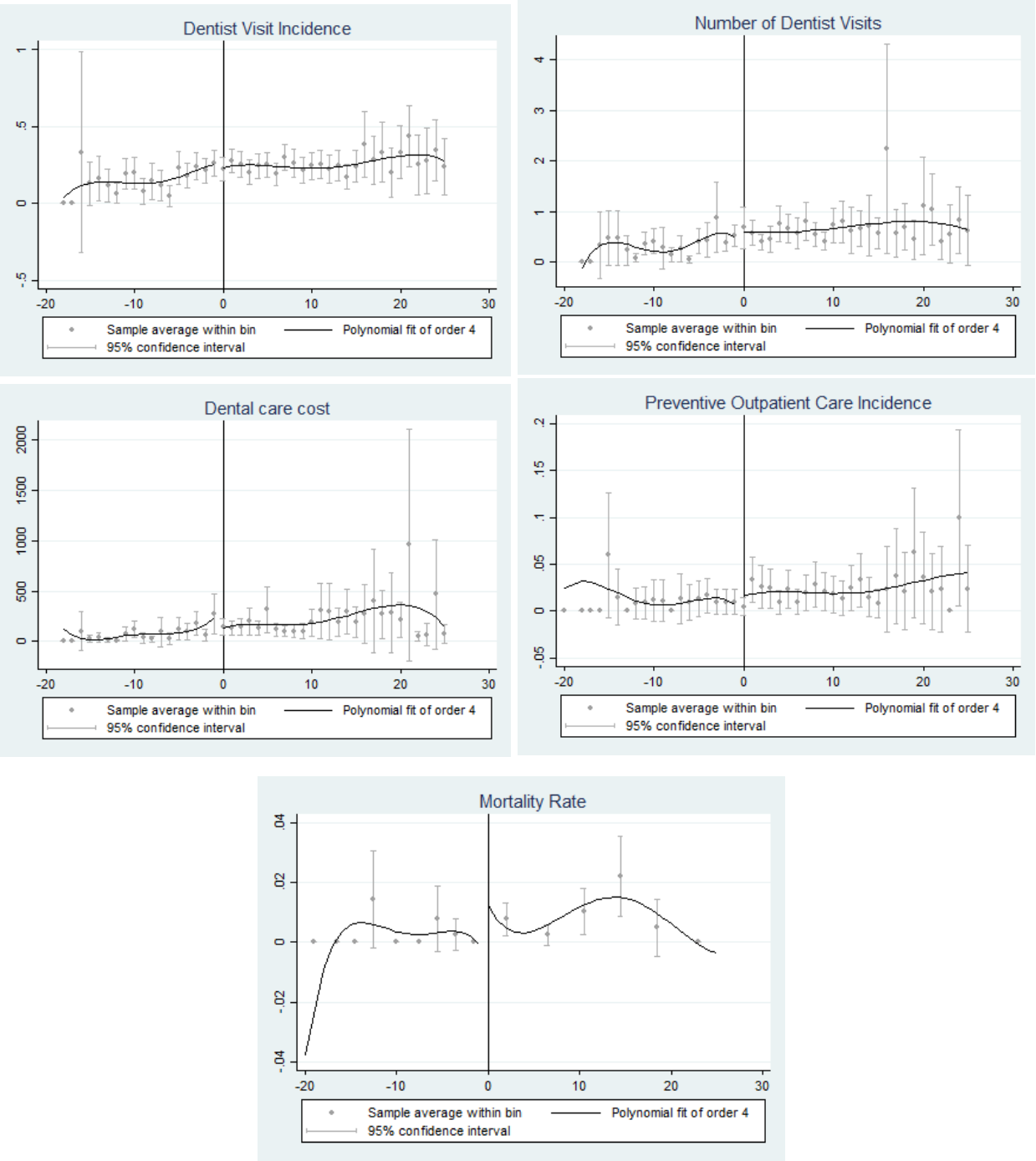


Figure B.11: RD Plots of Additional Variables by Normalized Age

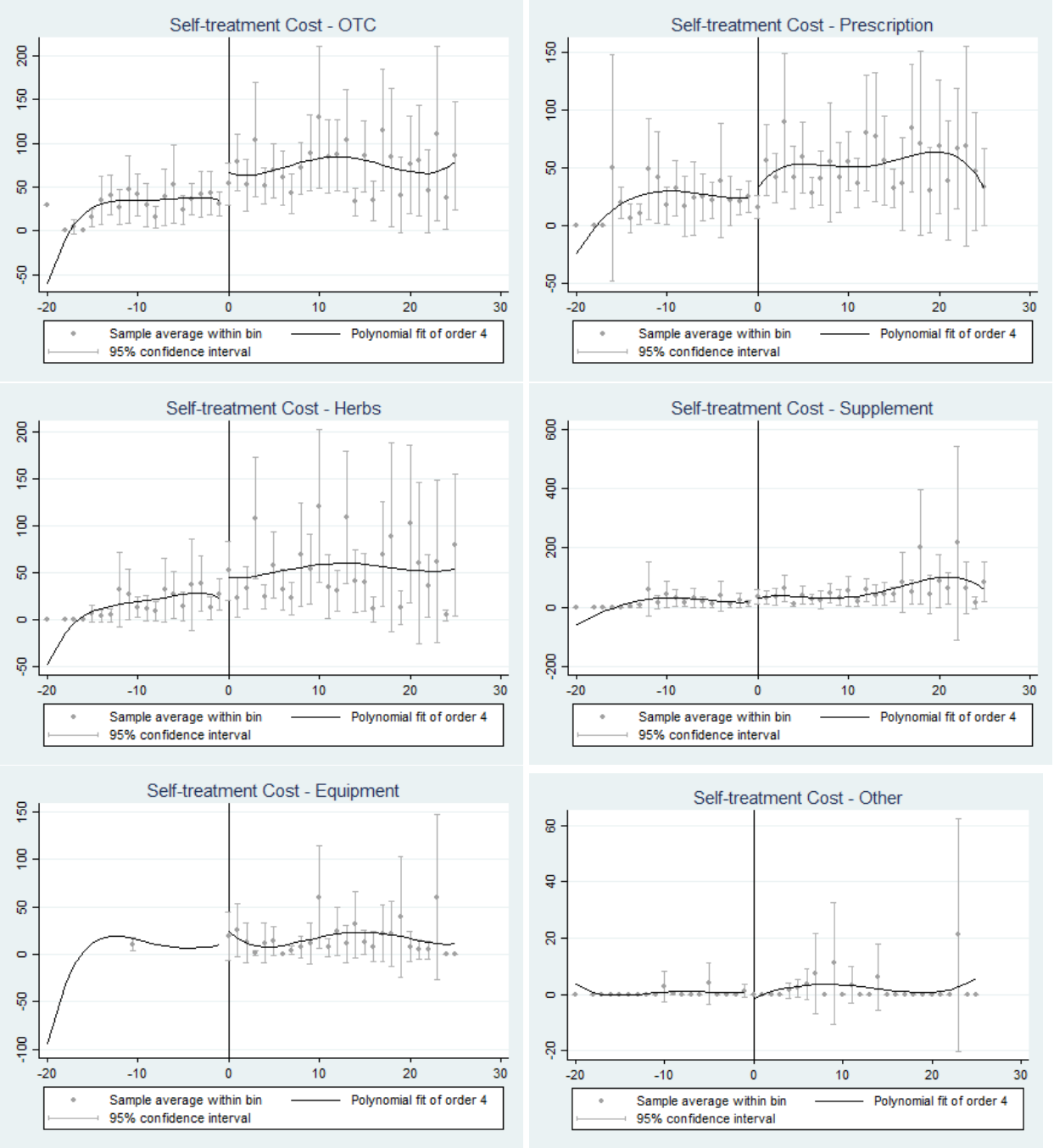


Figure B.11: (Continued)

Appendix C: Variables Used in Further Analysis

In additional analysis, the variables that we used are defined as follows:

(1) Mental health: the total score on a scale from 8 to 32 is added up based upon 8 questions about negative feelings last week. The larger the mental health score, the worse the respondent's mental health.

(2) Life Satisfaction: self-reported life satisfaction on a scale from 1 to 5: 1: completely satisfied; 2: very satisfied; 3: somewhat satisfied; 4: not very satisfied; 5: not at all satisfied.

(3) Individual income (in RMB): individual yearly wage, pension and other income (e.g. transfer payments from government etc.).

(4) Chronic disease: whether the respondent has any of the following diseases: hypertension, dyslipidemia, diabetes, malignant tumor, chronic lung diseases, liver disease, heart disease, stroke, kidney disease, digestive disease, psychiatric problems, memory-related disease, arthritis or rheumatism, and asthma.

(5) Smoking: a dummy indicating whether the respondent smokes or not.

(6) BMI: Body Mass Index calculated with the formula: BMI = Weight in Kg / (Height in cm)^2.

(7) Systolic blood pressure, and (8) Diastolic blood pressure measured in mmHg. Weight, height, and blood pressure are biomarkers which are measured during the interview.

(9) Diabetes, (10) Cancer, and (11) Stomach diseases: self-reported incidence of having diabetes, cancer, or stomach diseases.

(12) Pension: whether the respondent is accumulating or claiming a pension.

(13) Health insurance: whether the respondent is the policyholder/primary beneficiary of any type of health insurance.

(14) Mortality: a binary indicator for death between the two waves.

Variables (15) – (17) are only available in the second wave.

(15) Incidence of dentist visits: a binary indicator for visiting dentists in the past year.

(16) Number of dentist visits: the number of dentists visits in the past year.

(17) Dental cost: the total out-of-pocket cost of the dental care in the past year.

(18) Incidence of preventive outpatient care: whether the last doctor visit in the past month is for immunization, consultation or medical check-up.

(19) Incidence of working in public sector: whether currently work for or have retired from a government organization, institution, or 100% State owned firm.