

Appendices

A. Controls for individual fixed effects regressions

All regressions include individual fixed effects and the time from onset dummies, year dummies, state dummies, age, age-squared, a married indicator, number of children, education dummies (12 yrs, 13-15 yrs, 16, 17+), also head status interacted with age, and age-squared. The following co-variates are also included, depending on the outcome variable:

Outcome	Additional Controls
Annual Earnings, Hours, Hourly Earnings, Taxes	Education*Age interactions, Education*Age-sq interactions, Education*(linear time trend) interactions, Education*(linear time trend)-squared interactions
Income	Education*Age interactions, Education*Age-sq interactions, Education*(linear time trend) interactions, Education*(linear time trend)-squared interactions, number of family members, married indicator*(husband disability) interaction, married*(husband's age) interaction
Food, Food at Home, Food Away from Home, Food plus Housing	Number of men, number of women, number of kids (ages <=10), number of young adults (ages 11-17), number of elders (ages >=65) - And the squared of these five variables. married indicator*(husband current disability indicator) interaction, married*(husband's age) interaction
Public Transfers, and various benefits	Number of family members

B. Additional Figures for various economic outcomes

Figure A1

Change in Pre-tax Pre-Transfer Income Relative to Baseline

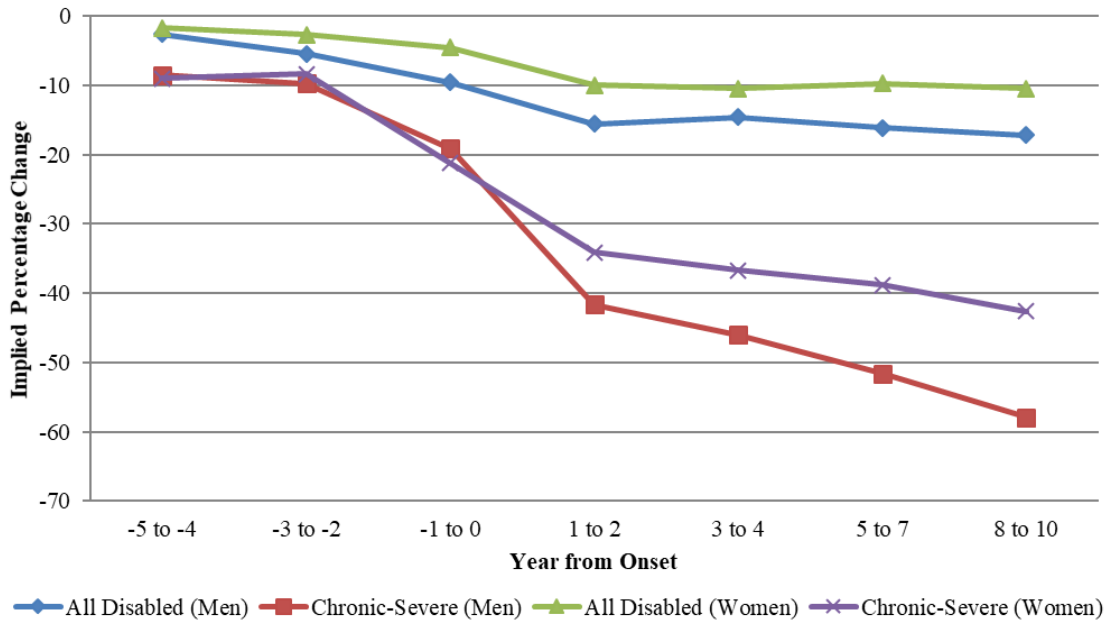


Figure A2

Change in After-tax Income with SSA Transfers Relative to Baseline

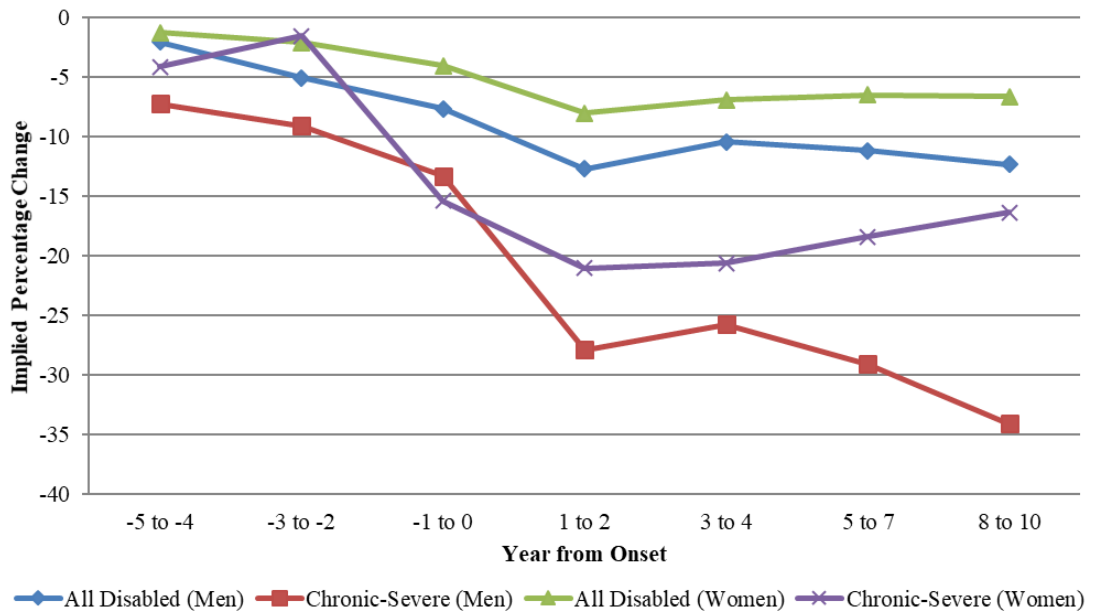


Figure A3
Change in AFDC/TANF Received (in 2016 dollars) Relative to Baseline

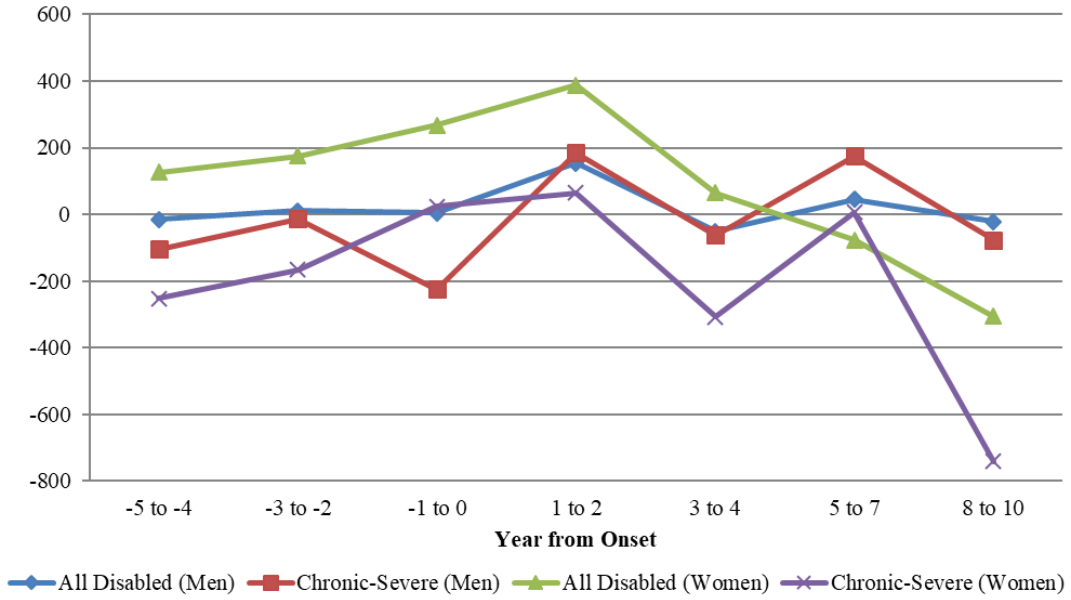


Figure A4
Change in Food Stamps/SNAP Received (in 2016 dollars) Relative to Baseline

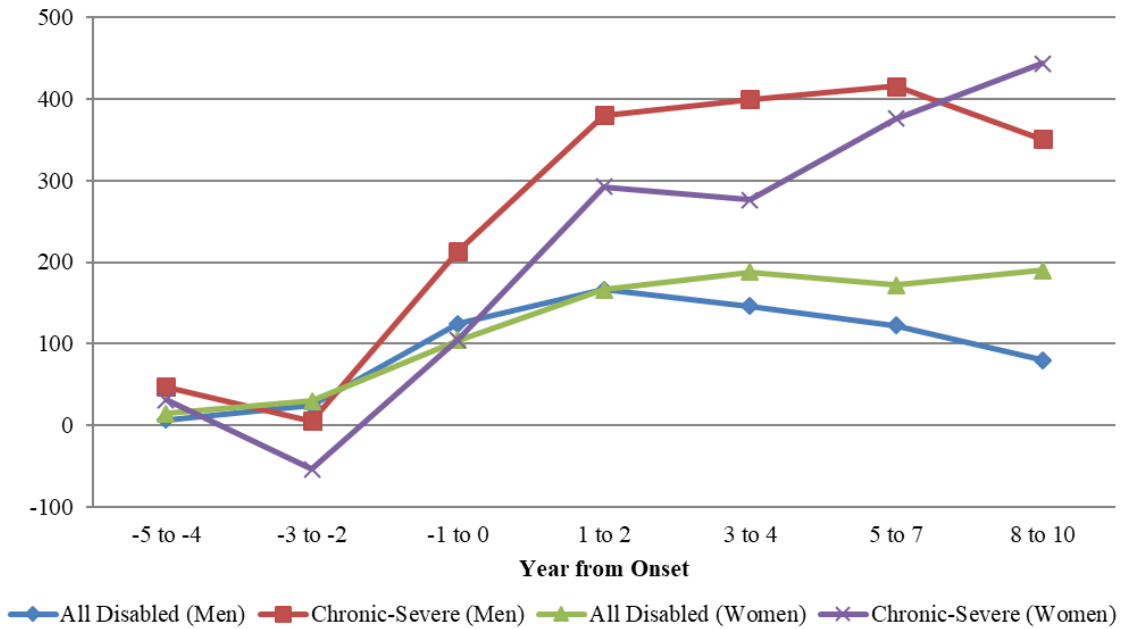


Figure A5
Change in Unemployment Insurance Received (in 2016 dollars) Relative to Baseline

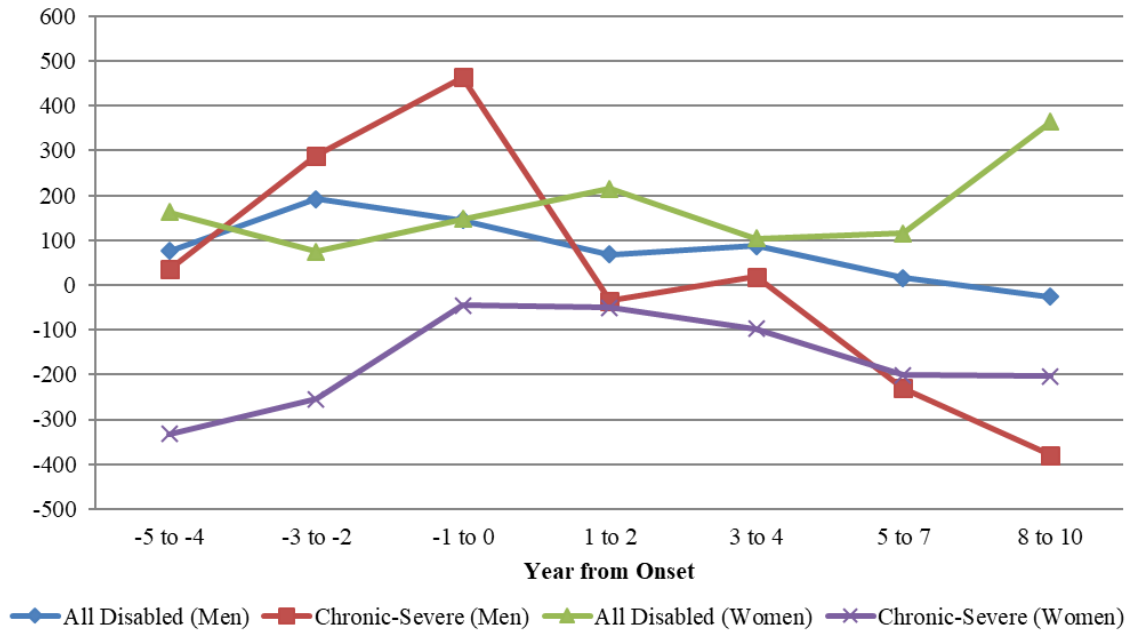


Figure A6
Change in Workers' Compensation Received (in 2016 dollars) Relative to Baseline

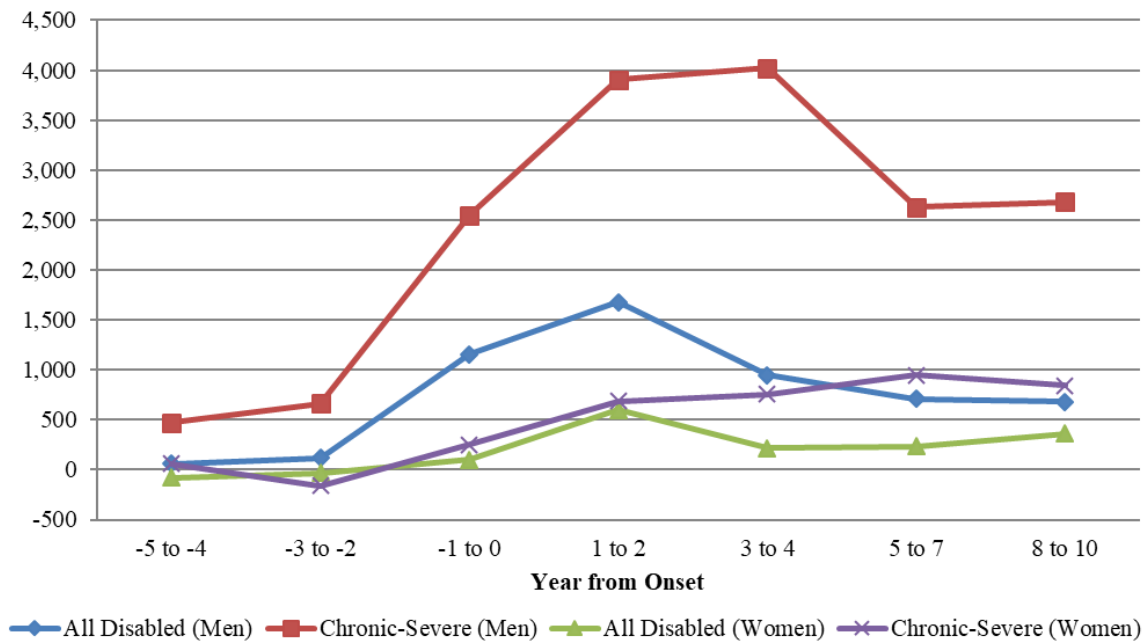


Figure A7
Change in Supplemental Security Income (in 2016 dollars) Relative to Baseline

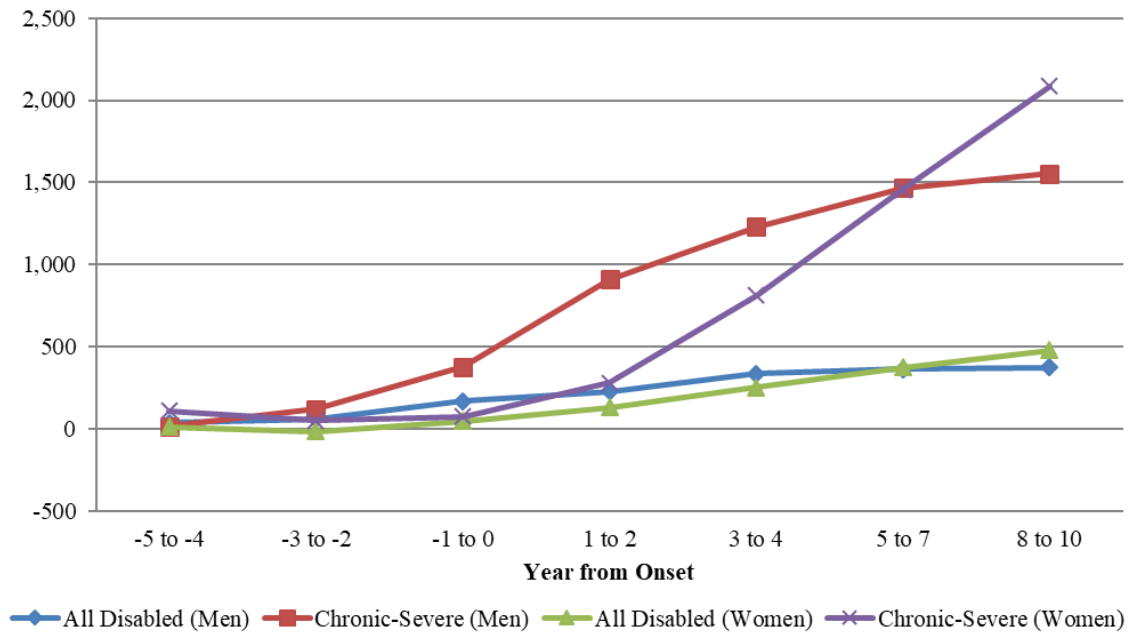


Figure A8
Change in Social Security Income (in 2016 dollars) Relative to Baseline

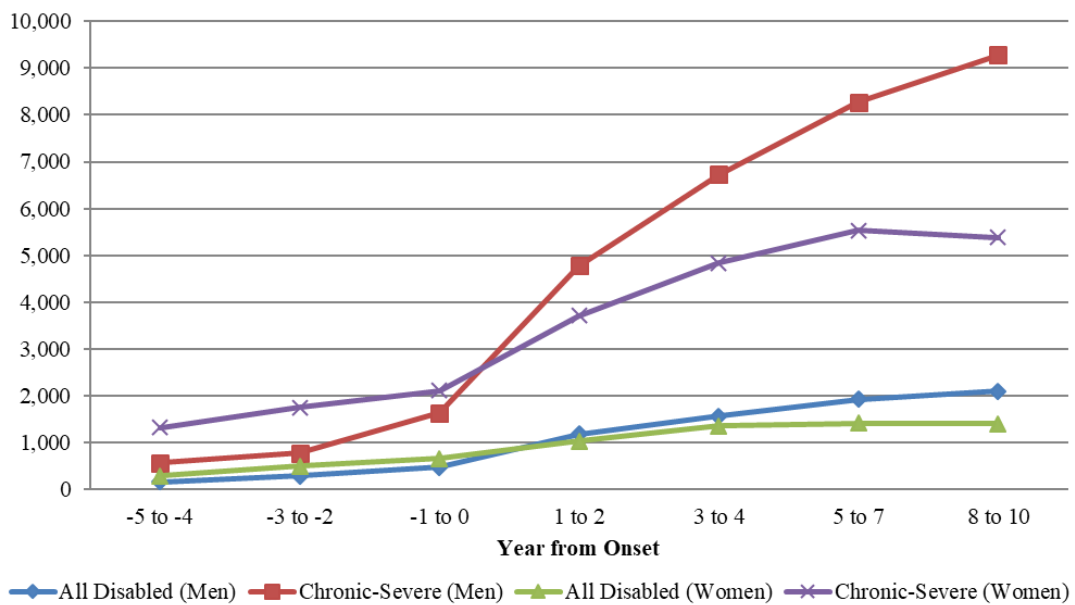


Figure A9
Change in Estimated Federal and State Income and FICA Tax Paid (in 2016 dollars) Relative to Baseline

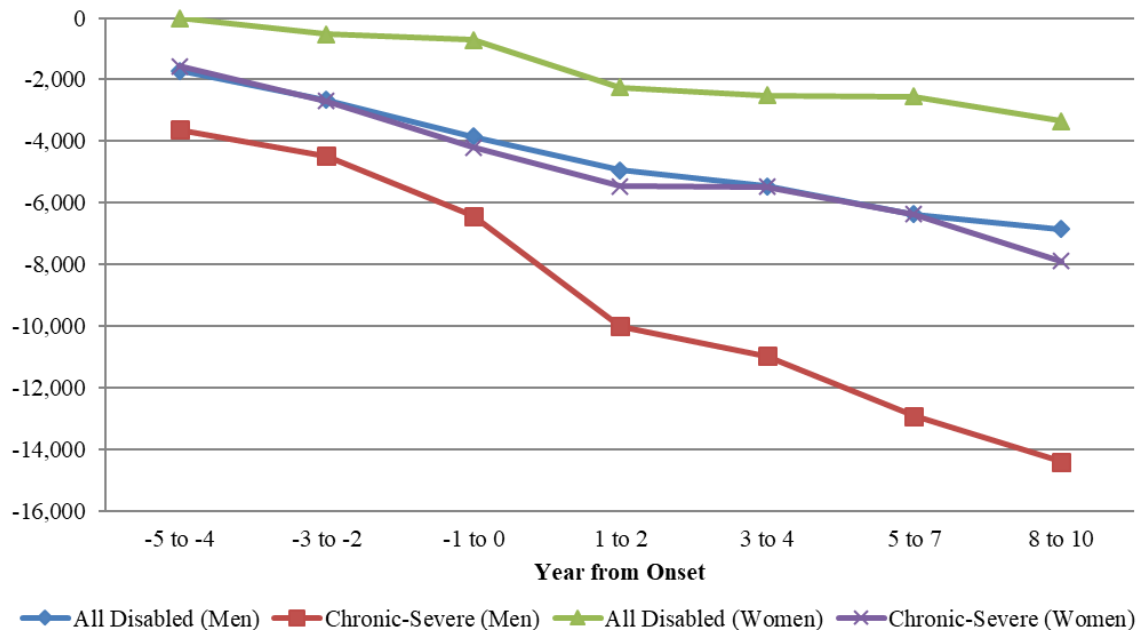


Figure A10
Change in Annual Hours of Work Relative to Baseline, Groups Defined by SSA Benefit Receipt and Disability

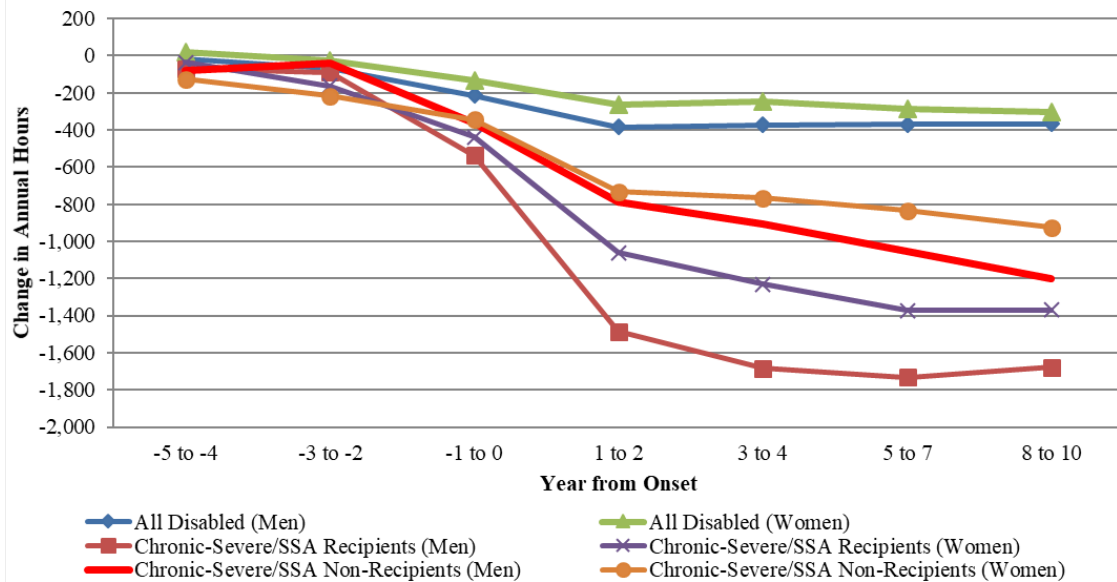


Figure A11
Change in After-Tax Post-Transfer Income Relative to Baseline,
Groups Defined by SSA Benefit Receipt and Disability

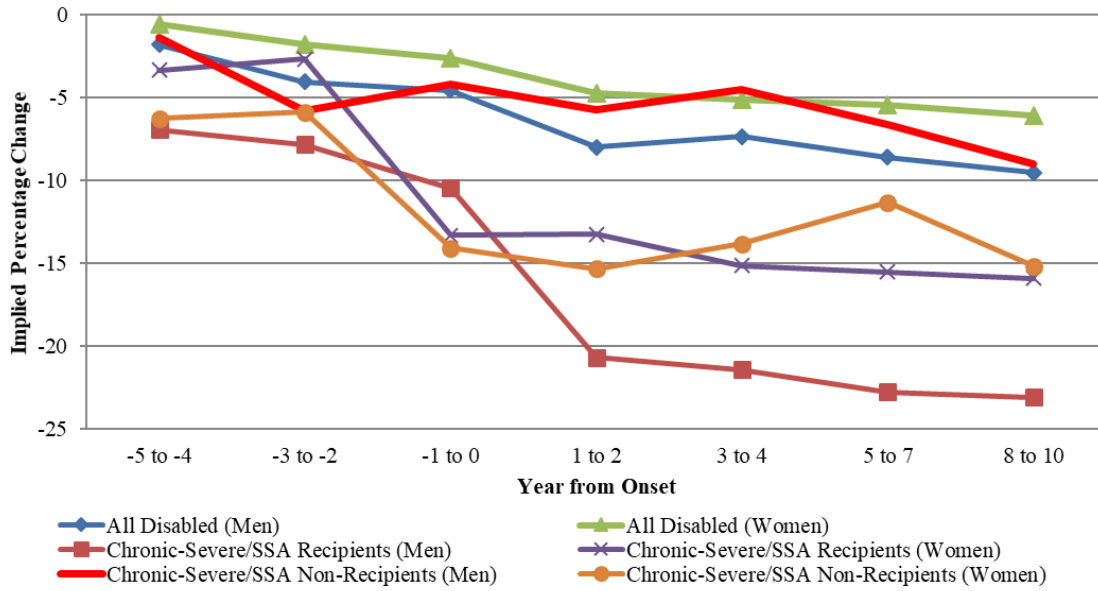
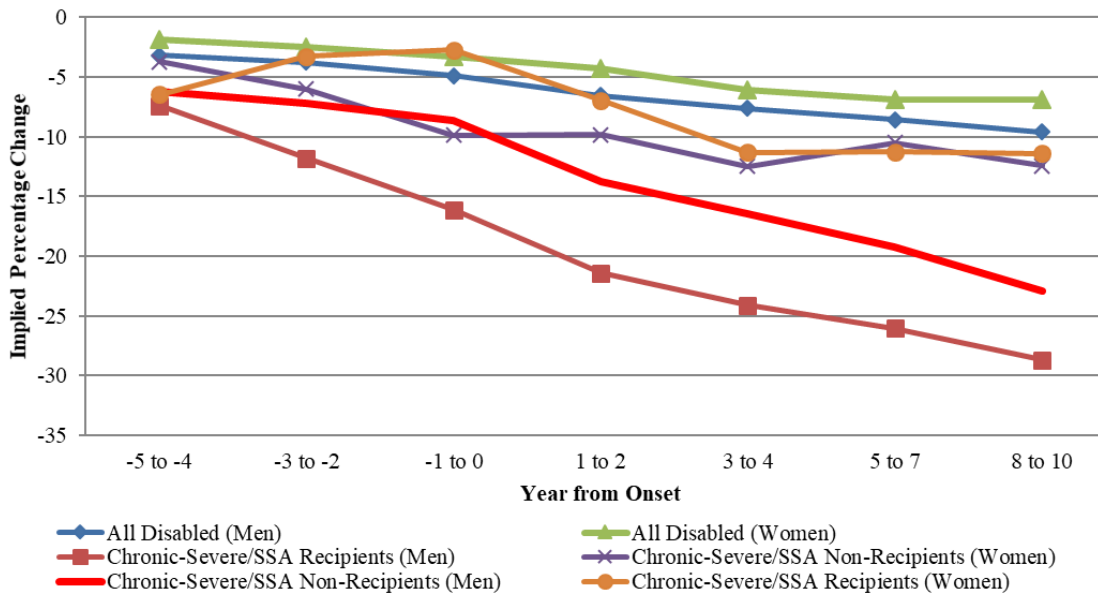


Figure A12
Change in Food plus Housing Consumption Relative to Baseline
Groups Defined by SSA Benefit Receipt and Disability



Appendix Table 1: Changes in Economic Outcomes Relative to Baseline, Disabled Male Family Heads

Year from Onset	Hours	Fraction not working	Earnings	Pre-tax Pre-transfer Income	After-tax Income without Transfers	After-tax income with SSA Transfers	After Tax Income with all Transfers	Food Consumption	Food plus Housing Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. All Disabled									
-5 to -4	-17	0.03	-5.00*	-2.62	-1.86	-2.04	-1.78	-1.02	-3.19**
	(18)	(0.01)	(2.10)	(1.65)	(1.34)	(1.46)	(1.32)	(1.03)	(1.01)
-3 to -2	-67**	0.03	-8.14**	-5.41**	-4.01*	-5.04**	-4.02*	-1.32	-3.78**
	(21)	(0.01)	(2.04)	(1.86)	(1.64)	(1.78)	(1.60)	(1.11)	(1.20)
-1 to 0	-216**	0.06	-13.98**	-9.53**	-7.50**	-7.61**	-4.54**	-2.82*	-4.88**
	(23)	(0.01)	(1.94)	(1.70)	(1.56)	(1.78)	(1.57)	(1.12)	(1.32)
1 to 2	-385**	0.14	-22.38**	-15.56**	-13.89**	-12.69**	-7.99**	-4.47**	-6.53**
	(26)	(0.01)	(2.16)	(1.89)	(1.65)	(1.79)	(1.70)	(1.22)	(1.41)
3 to 4	-375**	0.16	-21.99**	-14.60**	-12.28**	-10.41**	-7.33**	-5.75**	-7.61**
	(27)	(0.01)	(2.47)	(2.27)	(2.08)	(2.34)	(2.13)	(1.23)	(1.58)
5 to 7	-371**	0.18	-23.79**	-16.13**	-13.87**	-11.17**	-8.57**	-6.23**	-8.56**
	(29)	(0.01)	(2.67)	(2.35)	(2.18)	(2.42)	(2.22)	(1.23)	(1.83)
8 to 10	-369**	0.18	-24.23**	-17.16**	-14.64**	-12.32**	-9.50**	-5.78**	-9.61**
	(31)	(0.01)	(2.75)	(2.43)	(2.17)	(2.32)	(2.18)	(1.34)	(1.95)
B. Chronic-Severe									
-5 to -4	-93	0.03	-11.80**	-8.47**	-7.43**	-7.23*	-7.41**	-2.93	-7.11**
	(49)	(0.01)	(3.42)	(3.03)	(2.83)	(3.06)	(2.57)	(2.11)	(1.89)
-3 to -2	-103*	0.04	-14.87**	-9.70**	-8.38**	-9.09**	-8.27**	-7.04**	-10.15**
	(51)	(0.01)	(3.77)	(3.41)	(3.20)	(3.31)	(2.88)	(2.45)	(2.41)
-1 to 0	-509**	0.12	-30.78**	-19.10**	-16.55**	-13.27**	-9.24**	-9.46**	-13.05**
	(58)	(0.01)	(4.28)	(3.72)	(3.58)	(3.87)	(3.27)	(2.53)	(2.51)
1 to 2	-1,184**	0.45	-62.12**	-41.61**	-37.93**	-27.86**	-18.12**	-12.93**	-18.27**
	(65)	(0.02)	(3.71)	(3.45)	(3.32)	(3.58)	(3.27)	(2.81)	(2.49)
3 to 4	-1,335**	0.57	-67.67**	-45.99**	-41.58**	-25.73**	-17.87**	-17.35**	-20.86**
	(63)	(0.02)	(3.85)	(3.95)	(4.21)	(4.90)	(4.23)	(2.47)	(2.43)
5 to 7	-1,442**	0.64	-76.26**	-51.60**	-47.84**	-29.05**	-22.73**	-17.38**	-23.19**
	(62)	(0.02)	(3.04)	(3.30)	(3.30)	(3.68)	(3.31)	(2.52)	(2.48)
8 to 10	-1,497**	0.68	-79.16**	-57.88**	-53.92**	-34.07**	-27.74**	-18.78**	-26.36**
	(73)	(0.02)	(3.64)	(3.56)	(3.54)	(3.75)	(3.56)	(2.45)	(2.61)

Notes: The baseline period is the years prior to the fifth year before onset.

Appendix Table 2: Changes in Amount of Public Transfers Received Relative to Baseline, Disabled Male Family Heads

Year from Onset	All Public Transfers	AFDC/TANF	SNAP/Food Stamps	Unemployment Insurance	Workers' Compensation	Supplemental Security Income	Social Security (OASI and SSDI)	Income and Payroll Taxes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. All Disabled								
-5 to -4	275	-16	7	75	58	35	162*	-1,710*
	(163)	(41)	(28)	(64)	(87)	(31)	(82)	(670)
-3 to -2	523**	11	24	192**	119	62	287**	-2,667**
	(190)	(54)	(32)	(71)	(95)	(39)	(95)	(740)
-1 to 0	2,042**	5	124**	145*	1,158**	167**	479**	-3,854**
	(239)	(52)	(36)	(64)	(158)	(63)	(105)	(739)
1 to 2	4,139**	154*	167**	68	1,677**	226**	1,181**	-4,939**
	(334)	(65)	(38)	(65)	(228)	(53)	(142)	(930)
3 to 4	3,600**	-51	146**	87	948**	335**	1,570**	-5,463**
	(358)	(60)	(38)	(74)	(216)	(59)	(153)	(996)
5 to 7	3,662**	45	122**	15	710**	363**	1,921**	-6,378**
	(304)	(58)	(35)	(75)	(174)	(67)	(168)	(1,107)
8 to 10	3,741**	-22	80*	-26	679**	374**	2,098**	-6,859**
	(324)	(61)	(36)	(76)	(173)	(67)	(182)	(1,234)
B. Chronic-Severe								
-5 to -4	773	-105	47	36	470	14	571	-3,617**
	(444)	(130)	(87)	(99)	(278)	(72)	(319)	(736)
-3 to -2	1,250*	-14	5	289	660	119	778*	-4,482**
	(569)	(216)	(104)	(171)	(372)	(113)	(327)	(876)
-1 to 0	4,668**	-225	214*	464**	2,549**	376*	1,640**	-6,429**
	(837)	(187)	(104)	(174)	(613)	(153)	(388)	(975)
1 to 2	11,486**	185	380**	-35	3,904**	910**	4,785**	-10,009**
	(1,068)	(245)	(117)	(109)	(842)	(227)	(562)	(1,048)
3 to 4	13,552**	-62	399**	18	4,023**	1,228**	6,727**	-10,968**
	(1,536)	(221)	(110)	(177)	(1,159)	(255)	(587)	(1,120)
5 to 7	14,287**	175	415**	-230	2,630**	1,465**	8,272**	-12,922**
	(983)	(176)	(107)	(164)	(727)	(286)	(625)	(1,152)
8 to 10	14,486**	-77	351*	-379**	2,683**	1,554**	9,279**	-14,413**
	(1,210)	(251)	(141)	(133)	(847)	(316)	(706)	(1,272)

Notes: The baseline period is the years prior to the fifth year before onset.

**Appendix Table 3: Changes in Economic Outcomes Relative to Baseline,
Disabled Women with Year of Onset prior to 1990**

Year from Onset	Hours	Fraction not working	Earnings	Pre-tax Pre-transfer Income	After-tax Income without Transfers	After-tax income with SSA Transfers	After Tax Income with all Transfers	Food Consumption	Food plus Housing Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. All Disabled									
-5 to -4	43	0.29	2.19	-3	-3.41	-3.5	-2.87	-0.28	-1.67
	(26)	(0.01)	(3.13)	(1.96)	(1.96)	(1.88)	(1.78)	(1.23)	(1.24)
-3 to -2	14	0.27	1.83	-3.28	-4.06	-3.93	-3.05	-1.86	-3.17*
	(31)	(0.01)	(3.72)	(2.30)	(2.22)	(2.14)	(2.04)	(1.35)	(1.45)
-1 to 0	-58	0.27	-3.66	-5.82*	-6.04**	-5.83**	-3.77*	-0.32	-2.43
	(34)	(0.01)	(3.93)	(2.28)	(2.06)	(1.97)	(1.87)	(1.63)	(1.71)
1 to 2	-200**	0.33	-14.96**	-11.02**	-10.79**	-9.81**	-5.79**	-1.28	-4.00*
	(35)	(0.01)	(3.81)	(2.27)	(2.12)	(2.11)	(2.02)	(1.69)	(1.78)
3 to 4	-189**	0.35	-17.10**	-13.82**	-13.07**	-11.99**	-8.96**	-3.65*	-6.08**
	(38)	(0.01)	(3.86)	(2.33)	(2.25)	(2.06)	(1.99)	(1.61)	(1.95)
5 to 7	-231**	0.38	-19.35**	-13.77**	-14.12**	-11.38**	-9.30**	-3.27	-7.15**
	(39)	(0.01)	(3.96)	(2.51)	(2.24)	(2.25)	(2.14)	(1.81)	(2.13)
8 to 10	-241**	0.38	-19.90**	-12.53**	-11.36**	-9.05**	-8.07**	-3.67*	-6.57**
	(42)	(0.01)	(4.17)	(2.74)	(2.60)	(2.53)	(2.53)	(1.73)	(2.42)
B. Chronic-Severe									
-5 to -4	21	0.30	0.16	-5.20	-5.15	-1.16	-2.40	-2.16	-1.99
	(65)	(0.03)	(8.50)	(4.88)	(4.57)	(3.99)	(2.99)	(4.43)	(3.37)
-3 to -2	-88	0.28	-12.11	-6.45	-3.98	1.27	-0.93	-0.01	-4.97
	(79)	(0.03)	(9.77)	(5.30)	(4.81)	(4.21)	(3.88)	(4.76)	(3.58)
-1 to 0	-255**	0.35	-30.19**	-17.43**	-15.44**	-10.55*	-8.72*	1.30	-2.43
	(82)	(0.03)	(8.77)	(5.18)	(4.76)	(4.44)	(4.12)	(4.87)	(4.23)
1 to 2	-712**	0.56	-62.32**	-32.51**	-29.12**	-20.13**	-11.09**	-0.59	-4.73
	(87)	(0.03)	(5.84)	(4.80)	(4.47)	(4.48)	(4.17)	(5.20)	(4.14)
3 to 4	-802**	0.65	-68.03**	-35.51**	-33.00**	-20.98**	-12.91**	-6.15	-8.67*
	(91)	(0.02)	(5.59)	(4.45)	(4.31)	(4.36)	(4.06)	(5.05)	(4.37)
5 to 7	-881**	0.71	-69.88**	-35.76**	-34.79**	-16.82**	-9.10	-4.28	-7.93
	(94)	(0.02)	(6.55)	(5.86)	(5.32)	(5.83)	(5.21)	(4.95)	(5.12)
8 to 10	-937**	0.76	-75.80**	-41.21**	-35.08**	-14.21*	-11.89*	-3.68	-9.79*
	(95)	(0.02)	(5.08)	(4.87)	(5.10)	(5.52)	(5.12)	(5.24)	(4.54)

Notes: The baseline period is the years prior to the fifth year before onset.

**Appendix Table 4: Changes in Amount of Public Transfers Received Relative to Baseline,
Disabled Women with Year of Onset prior to 1990**

Year from Onset	All Public Transfers	AFDC/TANF	SNAP/Food Stamps	Unemployment Insurance	Workers' Compensation	Supplemental Security Income	Social Security (OASI and SSDI)	Income and Payroll Taxes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. All Disabled								
-5 to -4	395 (303)	239 (145)	3 (18)	185 (146)	-178* (80)	-2 (49)	23 (140)	-215 (440)
-3 to -2	716* (340)	321 (183)	27 (22)	247** (95)	-19 (109)	6 (60)	176 (175)	-396 (540)
-1 to 0	1,306** (380)	442* (189)	56* (26)	342** (132)	86 (122)	-19 (68)	307 (194)	-1129 (631)
1 to 2	2,218** (401)	682** (201)	134** (28)	405** (144)	276 (150)	-11 (61)	462* (202)	-2,109** (658)
3 to 4	2,128** (436)	182 (192)	148** (27)	344* (146)	314 (197)	169* (76)	671** (224)	-2,708** (666)
5 to 7	2,216** (446)	3 (185)	157** (27)	344 (180)	384 (210)	330** (76)	771** (219)	-2,892** (739)
8 to 10	2,268** (602)	-248 (192)	155** (29)	603 (415)	497* (221)	464** (78)	854** (228)	-3,357** (862)
B. Chronic-Severe								
-5 to -4	859 (1,052)	-545 (429)	42 (68)	-306* (147)	-395 (401)	198 (238)	1,529* (641)	-1003 (735)
-3 to -2	1652 (1,361)	-240 (623)	56 (84)	-85 (180)	-169 (458)	254 (323)	1,821* (733)	-2034 (1,074)
-1 to 0	2445 (1,289)	-284 (664)	147 (89)	130 (237)	153 (521)	125 (286)	1,949** (713)	-2,861** (1,106)
1 to 2	5,010** (1,217)	-162 (647)	304** (105)	261 (240)	541 (532)	242 (260)	2,710** (690)	-4,184** (1,067)
3 to 4	6,135** (1,399)	-719 (673)	341** (102)	69 (208)	683 (714)	821* (358)	3,465** (722)	-4,063** (1,185)
5 to 7	7,992** (1,568)	-421 (724)	383** (104)	141 (217)	1255 (1,052)	1,460** (384)	4,198** (721)	-4,935** (1,277)
8 to 10	7,729** (1,612)	-1157 (745)	428** (107)	108 (211)	1253 (1,045)	2,199** (419)	4,192** (769)	-6,606** (1,356)

Notes: The baseline period is the years prior to the fifth year before onset.

**Appendix Table 5: Changes in Economic Outcomes Relative to Baseline,
Disabled Women with Year of Onset after 1990**

Year from Onset	Hours	Fraction not working	Earnings	Pre-tax Pre-transfer Income	After-tax Income without Transfers	After-tax income with SSA Transfers	After Tax Income with all Transfers	Food Consumption	Food plus Housing Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. All Disabled									
-5 to -4	8 (27)	0.16 (0.01)	0.81 (2.69)	-1.19 (2.67)	-0.35 (2.48)	0.08 (2.49)	1.22 (2.41)	1.11 (1.45)	-2.15 (1.48)
-3 to -2	-46 (30)	0.17 (0.01)	-2.83 (2.79)	-2.87 (2.85)	-2.17 (2.54)	-1.55 (2.84)	-1.48 (2.72)	0.35 (1.72)	-1.49 (2.14)
-1 to 0	-207** (32)	0.22 (0.01)	-12.49** (2.93)	-3.88 (4.21)	-3.92 (3.60)	-3.61 (3.99)	-2.43 (3.83)	-2.3 (1.59)	-4.44* (2.06)
1 to 2	-331** (37)	0.32 (0.01)	-23.52** (3.02)	-9.85** (3.56)	-9.84** (3.14)	-7.52* (3.21)	-4.4 (3.14)	-0.86 (1.63)	-4.44* (2.13)
3 to 4	-308** (40)	0.31 (0.01)	-23.79** (3.12)	-7.14 (3.74)	-5.74 (3.64)	-2.33 (3.74)	-1.04 (3.60)	-1.22 (1.69)	-5.97** (2.00)
5 to 7	-335** (39)	0.30 (0.01)	-23.12** (3.32)	-5.03 (4.39)	-5.64 (3.37)	-2.4 (3.36)	-1.68 (3.23)	-1.52 (1.83)	-5.96** (2.16)
8 to 10	-379** (46)	0.28 (0.02)	-25.01** (3.79)	-8.69* (3.81)	-8.63** (3.31)	-5.38 (3.36)	-4.43 (3.25)	0.44 (2.11)	-6.99** (2.39)
B. Chronic-Severe									
-5 to -4	-128 (91)	0.19 (0.04)	-10.95 (6.69)	-12.80* (5.55)	-10.67* (4.82)	-7.85 (5.17)	-6.20 (4.57)	-5.52 (4.72)	-8.68* (3.56)
-3 to -2	-246** (95)	0.20 (0.04)	-14.51 (8.11)	-9.41 (5.19)	-4.33 (4.98)	-5.03 (5.34)	-7.02 (4.76)	8.16 (8.72)	-1.68 (5.27)
-1 to 0	-521** (101)	0.31 (0.04)	-34.73** (7.62)	-24.59** (5.04)	-23.46** (4.29)	-22.55** (4.27)	-19.70** (4.04)	-4.22 (5.40)	-11.46** (3.81)
1 to 2	-1,120** (116)	0.71 (0.04)	-74.72** (6.35)	-35.20** (5.16)	-32.26** (5.12)	-21.70** (5.04)	-17.32** (4.90)	-3.28 (5.52)	-12.07** (3.97)
3 to 4	-1,213** (106)	0.77 (0.04)	-83.49** (4.37)	-37.22** (6.59)	-35.32** (6.57)	-19.10** (6.29)	-13.34* (5.59)	-7.44 (5.53)	-14.99** (3.99)
5 to 7	-1,343** (93)	0.80 (0.03)	-88.96** (3.19)	-42.92** (4.67)	-39.09** (5.06)	-20.69** (4.72)	-17.72** (4.59)	-5.57 (4.96)	-12.23** (4.38)
8 to 10	-1,419** (104)	0.79 (0.05)	-90.37** (2.77)	-43.64** (7.05)	-38.27** (6.80)	-21.29** (6.37)	-21.67** (5.79)	-6.56 (5.85)	-10.55* (4.95)

Notes: The baseline period is the years prior to the fifth year before onset.

**Appendix Table 6: Changes in Amount of Public Transfers Received Relative to Baseline,
Disabled Women with Year of Onset after 1990**

Year from Onset	All Public Transfers	AFDC/TANF	SNAP/Food Stamps	Unemployment Insurance	Workers' Compensation	Supplemental Security Income	Social Security (OASI and SSDI)	Income and Payroll Taxes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. All Disabled								
-5 to -4	1,100** (376)	32 (95)	16 (32)	222 (185)	87 (206)	8 (53)	404* (173)	292 (1,032)
-3 to -2	750* (306)	70 (112)	21 (32)	-61 (83)	-19 (153)	-86 (52)	670** (191)	-711 (988)
-1 to 0	1,766** (364)	157 (136)	155** (40)	-9 (100)	225 (181)	112 (72)	833** (211)	351 (2,022)
1 to 2	3,710** (618)	133 (129)	195** (45)	85 (126)	1,159** (441)	290** (95)	1,500** (251)	-2231 (1,546)
3 to 4	3,130** (432)	56 (139)	238** (53)	-77 (105)	232 (201)	333** (92)	2,052** (283)	-1,845 (1,490)
5 to 7	3,010** (427)	-37 (129)	170** (52)	-62 (103)	147 (174)	381** (105)	2,081** (268)	-1625 (1,670)
8 to 10	3,023** (456)	-116 (131)	240** (56)	94 (138)	217 (226)	365** (107)	1,939** (301)	-3,013 (1,603)
B. Chronic-Severe								
-5 to -4	1,015 (1,078)	28 (269)	46 (129)	-155 (202)	991 (809)	1 (168)	286 (416)	-1,656 (1,267)
-3 to -2	-1,015 (702)	-412 (280)	-219* (91)	-334 (242)	-158 (209)	-348 (230)	594 (516)	-2256 (1,499)
-1 to 0	2,142 (1,267)	313 (404)	56 (114)	-85 (309)	592 (751)	55 (367)	1,152 (590)	-5,539** (1,373)
1 to 2	6,692** (1,352)	111 (321)	304* (152)	-389 (261)	1264 (955)	481 (377)	4,695** (912)	-6,469** (1,324)
3 to 4	9,735** (1,615)	273 (303)	122 (146)	50 (400)	1347 (1,134)	877* (348)	6,952** (1,288)	-7,077** (1,467)
5 to 7	9,941** (1,444)	632 (346)	401* (159)	-634** (166)	398 (703)	1,557** (444)	7,448** (1,108)	-8,067** (1,589)
8 to 10	7,719** (1,392)	265 (301)	646** (190)	-597** (203)	-946* (451)	1,349* (585)	7,198** (1,169)	-9,292** (2,372)

Notes: The baseline period is the years prior to the fifth year before onset.

Appendix Table 7

Benefit Receipt Rates, Work and Wealth for Disabled Male Household Heads

	All Disabled	Extent of Disability			
		One-Time	Temporary	Chronic-Not Severe	Chronic-Severe
Benefit Receipt Rate					
Social Security	0.136	0.037	0.057	0.108	0.488
Supplemental Security Income	0.027	0.008	0.017	0.015	0.098
Social Security or SSI	0.150	0.044	0.068	0.117	0.532
Workers' Compensation	0.040	0.012	0.047	0.044	0.057
Unemployment Insurance	0.078	0.058	0.090	0.101	0.037
Food Stamps	0.108	0.049	0.086	0.107	0.246
Subsidized Housing	0.025	0.023	0.021	0.021	0.036
Any one of the above	0.318	0.166	0.241	0.313	0.707
Work and Wealth					
Not receiving any benefit above and working fewer than 1000 hours	0.145	0.206	0.129	0.122	0.143
Median Net Wealth at Onset (2016 Dollars)	\$51,264	\$53,503	\$55,013	\$46,741	\$29,317
Median Net Wealth (2016 Dollars)	\$71,761	\$89,972	\$63,091	\$76,268	\$32,993

Notes: Unless indicated otherwise, the benefit receipt rates and median net wealth are numbers for the 6-10 years after a male household head's year of disability onset. Benefits received are reported at the family level. The receipt rates are not adjusted for underreporting.