Web Appendix

Web Appendix Figure 1. Creation of the full and SES sample of family-years



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web Appendix Table .	2. Summar	y of balance	; oming	in the	SES	sample

	Mean	SD	Median	75th percentile	90 th percentile		
Among all family-years (n=68,659)							
Total Balance billing for family-year	\$423	\$2762	\$0	\$143	\$720		
Balance billing per member in family-year	\$187	\$1247	\$0	\$51	\$286		
Balance billing as a proportion of family out-of-network out- of-pocket expenditures	15%	23%	0%	24%	50%		
An	nong family-ye	ars with any ba	alance billin	g (n=32,777)			
Total Balance billing for family-year	\$886	\$3946	\$159	\$569	\$1668		
Balance billing per member in family-year	\$391	\$1783	\$58	\$218	\$734		
Balance billing as a proportion of family out-of-network out- of-pocket expenditures	30%	26%	24%	43%	66%		

SD: Standard Deviation

a: Dollar amounts were adjusted for inflation to 2014 values.

Web Appendix Table 3. Differences in balance billing by member in family-year, by subscriber and family characteristics (n=68,659)

	Balance billing by member in family-year ^{a,b}	
	Marginal effect (\$)	95% CI
Plan characteristics		
Carve-out status (versus Carve-in)	244*	(162, 327)
HMO (versus non-HMO)	73*	(38, 108)
Provider supply		
Short-term hospital beds per 10K people	3*	(0.1, 6)
Psychiatric hospitals per 10K people	-407	(-1357, 544)
In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people	-3*	(-4, -2)
Subscriber highest level of educational etteinment (ref- Rechelor's degree or higher)		
Subscriber ingliest level of educational attainment (ref– bachelor's degree of inglief)	00*	(125 72)
	-99	(-123, -72)
Some conege	-04 -	(-103, -62)
	-70	(-100, -51)
Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)		
Income: <75K & net worth: 25K-100K	-16	(-59, 27)
Income: < 75K & net worth: >=100K	7	(-34, 48)
Income: 75K-150K & net worth: <100K	-12	(-53, 29)
Income: 75K-150K & net worth: 100K-250K	-23	(-60, 15)
Income: 75K-150K & net worth: >250K	-26	(-61, 10)
Income: >150K & net worth: < 500K	-8	(-46, 30)
Income: >150K & net worth: >= 500K	2	(-35, 40)
Subscriber race-ethnicity and language (ref=white, any language)		
Asian, English	-2	(-55, 52)
Asian, other language	22	(-49, 93)
Black, any language	1	(-36, 35)
Hispanic, English	-7	(-102, 74)
Hispanic, other language	31	(-18, 81)
Other, any language	7	(-26, 40)
Subscriber age (ref=45-54 years old)		
18-24	-110*	(-163, -56)
25-34	-49*	(-73, -25)
35-44	-18	(-39, 2)
55-64	-7	(-30, 16)
65+	-25	(-76, 26)
Subseriber relationship (ref-single)		
Subscriber relationship (rel-single)	125*	(195 95)
Domestic partner, same gender	-133	(-103, -03)
Shouse different gender	-75	(-1.34, 7)
Spouse, amergender	-122	(-144, -101) (-257 - 05)
	-1/0	(-237, -93)
Number of dependents (ref=0)		
1	-51*	(-66 -35)
2	-52*	(-64, -40)
	+	(- , - , - , - , - , - , - , - , - , -

	Balance billing by member in family-year ^{a,b}	
	Marginal effect	95% CI
	(\$)	
3	-61*	(-72, -50)
4+	-71*	(-83, -59)
Diagnosis-type/s in family		
Adjustment disorder	18*	(2, 35)
PTSD	56*	(17, 95)
Generalized anxiety disorder	53*	(37, 70)
Obsessive compulsive disorder	66*	(20, 111)
Panic disorder	-23	(-52, 7)
Phobia disorders	73*	(24, 123)
Attention deficit hyperactivity disorder	-10	(-48, 28)
Other child behavioral health disorders	15	(-24, 54)
Pervasive developmental disorder	288*	(197, 379)
Bipolar disorder	28*	(9, 47)
Depression	40*	(24, 56)
Personality disorder	73*	(2, 143)
Schizophrenia	-67*	(-91, -43)
Alcohol use disorder	201*	(153, 249)
Drug use disorder	506*	(427, 584)
Other behavioral health disorders	45*	(23, 66)

*P<0.05

a: All models also control for subscriber employer characteristics (size, industry, region, etc.) whether or not plans are an HMO, unknown income and net worth < \$150K and unknown income and net worth >= 150K, and calendar years. Marginal effects are generated using the margins command in STATA.

b: Models used a two-part model for total family-year balance billing. Part 1 of the two-part model uses logit to determine the probability of having any balance billing. Part 2 of the two-part model uses a gamma regression to determine the average change in balance-billing level among those with any balance billing. The results reported here combined parts 1 and 2 to report the change in balance-billing level among the full sample, unconditional on whether they had any balance billing.

Web Appendix Table 4. Differences in adjusted balance billing by subscriber and family characteristics, sensitivity analysis controlling for whether diagnoses occurred alone or together with other behavioral health diagnoses, (n=68,659)

	Total family-year balance billing ^{a,t}	
	Marginal effect (\$)	95% CI
Plan characteristics		
Carve-out status (versus Carve-in)	407*	(320, 494)
HMO (versus non-HMO)	154*	(80, 229)
		i
Provider supply		
Short-term hospital beds per 10K people	7*	(1, 14)
Psychiatric hospitals per 10K people	-719	(-2708, 1270)
In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people	-7*	(-10, -5)
		· · · ·
Subscriber highest level of educational attainment (ref= Bachelor's degree or higher)		
High school or lower	-223*	(-284, -162)
Some college	-182*	(-225, -140)
Associates degree	-166*	(-218, -113)
U		
Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)		
Income: <75K & net worth: 25K-100K	-15	(-105, 75)
Income: < 75K & net worth: >=100K	27	(-55, 109)
Income: 75K-150K & net worth: <100K	18	(-67, 103)
Income: 75K-150K & net worth: 100K-250K	-29	(-108, 50)
Income: 75K-150K & net worth: >250K	-36	(-110, 38)
Income: >150K & net worth: < 500K	15	(-63, 93)
Income: >150K & net worth: >= 500K	37	(-38, 113)
Subscriber race-ethnicity and language (ref=white, any language)		
Asian, English	7	(-107, 121)
Asian, other language	43	(-91, 178)
Black, any language	14	(-60, 89)
Hispanic, English	-1	(-85, 83)
Hispanic, other language	76*	(-14, 166)
Other, any language	18	(-49, 86)
Subscriber age (ref=45-54 years old)		
18-24	-364*	(-563, -165)
25-34	-146*	(-202, -91)
35-44	-50*	(-91, -9)
55-64	-29	(-74, 15)
65+	-60	(-169, 49)
Subscriber relationship (ref=single)		
Domestic partner, different gender	-47	(-191, 96)
Domestic partner, same gender	73	(-96, 242)
Spouse, different gender	-24	(-61, 13)
Spouse, same gender	-212	(-547, 122)
Number of dependents (ref=0)		
1	33*	(0.5, 65)
2	17	(-8, 41)
3	-6	(-28, 16)

	Total family-year ba	lance billing ^{a,b}
	Marginal effect (\$)	95% CI
4+	-28*	(-51, -5)
Diagnosis		
Adjustment disorder only	-139*	(-203, -75)
Adjustment disorder and at least one other diagnosis	71*	(30, 111)
PTSD only	-276	(-817, 265)
PTSD and at least one other diagnosis	71*	(3, 140)
Generalized anxiety disorder only	-49	(-122, 224)
Generalized anxiety disorder and at least one other diagnosis	109*	(70, 148)
Obsessive compulsive disorder only	-5	(-206, 196)
Obsessive compulsive disorder and at least one other diagnosis	116*	(37, 194)
Panic disorder only	-	-
Panic disorder and at least one other diagnosis	-87*	(-157, -17)
Phobia disorders only	-117	(-418, 183)
Phobia disorders and at least one other diagnosis	117*	(37, 198)
Attention deficit hyperactivity disorder only	-	-
Attention deficit hyperactivity disorder and at least one other diagnosis	-69	(-159, 22)
Other child behavioral health disorders only	-210*	(-383, -38)
Other child behavioral health disorders and at least one other diagnosis	52	(-36, 140)
Pervasive developmental disorder only	528*	(348, 708)
Pervasive developmental disorder and at least one other diagnosis	305*	(215, 395)
Bipolar disorder only	-206*	(-345, -67)
Bipolar disorder and at least one other diagnosis	50*	(9, 91)
Depression only	-28	(-102, 47)
Depression and at least one other diagnosis	39	(-2, 81)
Personality disorder only	-26	(-789, 737)
Personality disorder and at least one other diagnosis	120*	(9, 231)
Schizophrenia only	-318*	(-582, -53)
Schizophrenia and at least one other diagnosis	-160*	(-232, -88)
Alcohol use disorder only	811*	(618, 1003)
Alcohol use disorder and at least one other diagnosis	240*	(169, 310)
Drug use disorder only	1040*	(863, 1217)
Drug use disorder and at least one other diagnosis	649*	(568, 729)
Other behavioral health disorders only	-182*	(-302, -62)
Other behavioral health disorders and at least one other diagnosis	111*	(68, 156)

a: All models also control for subscriber employer characteristics (size, industry, region, etc.), unknown income and net worth < \$150K and unknown income and net worth >= 150K and calendar years. Marginal effects are generated using the margins command in STATA.

b: Models used a two-part model for total family-year balance billing. Part 1 of the two-part model uses logit to determine the probability of having any balance billing. Part 2 of the two-part model uses a gamma regression to determine the average change in balance-billing level among those with any balance billing. The results reported here combined parts 1 and 2 to report the change in balance-billing level among the full sample, unconditional on whether they had any balance billing.

	Maan (SD) Madian		75th	90 th		
	Mcall (SD)	wiculaii	percentile	percentile		
Among all family-years (n=190,072)						
Total balance billing for family- year	\$363 (\$1934)	\$0	\$155	\$692		
Balance billing per member in family-year	\$165 (\$945)	\$0	\$57	\$283		
Balance billing as a proportion of family out-of-network out-of- pocket expenditures	17% (25%)	0%	28%	54%		
Among far	nily-years with balanc	e billing (n=93,222	2)			
Total balance billing for family- year	\$741 (\$2710)	\$161	\$530	\$1472		
Balance billing per member in family-year	\$337 (\$1329)	\$60	\$212	\$669		
Balance billing as a proportion of family out-of-network out-of- pocket expenditures	32% (26%)	27%	48%	69%		

Web Appendix Table 5a. Summary of balance billing^a in full sample using trimmed balance-balance billing values

SD: Standard Deviation

a: Dollar amounts were adjusted for inflation to 2014 values.

Web Appendix Table 5b. Summary of balance billing^b in the SES sample using trimmed balance billing values

	Mean (SD)	Median	75th	90 th
A	Among all family-years (n=66.648)		percentife	percentile
Total balance billing for family- year	\$350 (\$1986)	\$0	\$125	\$615
Balance billing per member in family-year	\$157 (\$901)	\$0	\$46	\$246
Balance billing as a proportion of family out-of-network out-of- pocket expenditures	14% (23%)	0%	22%	48%
Among far	nily-years with balanc	e billing (n=31,16	5)	
Total balance billing for family- year	\$748 (\$2852)	\$148	\$494	\$1436
Balance billing per member in family-year	\$336 (\$1294)	\$53	\$195	\$654
Balance billing as a proportion of family out-of-network out-of- pocket expenditures	30% (25%)	23%	42%	65%

SD: Standard Deviation

b: Dollar amounts were adjusted for inflation to 2014 values.

Web Appendix Table 6. Adjusted differences in probability of any balance billing, and differences in level of total balance billing among those with any balance billing and among all family-years, by plan characteristics, provider supply, and subscriber and family characteristics, using trimmed balance billing values (n=66,648)

suppry, and subscriber and family endracter	Difference i		Differen	$\frac{10}{100}$	Differen	
	Difference in	lanas hilling	balanaa hilling among family		billing among all	
	of any ba	(AR) ab	balance bil	ling among family-	balance b	iling among all
	(n=o	0,048)	years with a	-21 165)	lam (n	-66.648
	Doroontago	05% CI	(I ¢	05% CI	¢ (II	-00,048)
	Percentage	93% CI	Ф	93% CI	Ф	93% CI
Plan abayastaristics	points					
Correct out status (correct Correct in)	20*	(2(20)	12(*	(229, (14))	40.4*	(2(1,(2()
Line (United and Carve-In)	28*	(20, 29)	420**	(238, 014)	494*	(301, 020)
HMO (versus non-HMO)	15*	(13, 17)	/8	(-36, 192)	151*	(96, 206)
Duonidan munitu						
Short term bagnitel hade non 10K naonla	0.002	(0, 2, 0, 1)	0	(1.10)	4	(10)
Breachistais heavitals new 10K neeple	-0.003	(-0.2, 0.1)	9	(-1, 19)	4	(-1, 9)
Psychiatric hospitals per TOK people	/	(-41, 55)	98	(-297, 3174)	-98	(-1387, 1383)
In-network benavioral nealth providers (MD,	0.03	(-0.04, 0.1)	-11*	(-15, -8)	-3*	(-7, -3)
PhD, MSW, RN) per 10K people						
Subscriber highest level of educational						
attainment (ref= Rachelor's degree or						
higher)						
High school or lower	-4*	(-6, -3)	-249*	(-337 -162)	-149*	(-191 -107)
Some college	-4*	(-5, -3)	-200*	(-268 -133)	-127*	(-160, -93)
Associates degree	_3*	(-5, -2)	-180*	(-260, -99)	-111*	(-150, -72)
	5	(3, 2)	100	(200, 99)	111	(150, 72)
Subscriber income and net worth (ref=						
Income: <75K & net worth: <= 25K)						
Income: <75K & net worth: 25K-100K	-2	(-4, 0.5)	10	(-123, 143)	-7	(-71, 57)
Income: < 75K & net worth: >=100K	-1	(-3, 0.7)	31	(-91, 153)	6	(-53, 65)
Income: 75K-150K & net worth: <100K	-4*	(-6, -2)	101	(-32, 234)	16	(-47, 78)
Income: 75K-150K & net worth: 100K-250K	-2	(-4, 0.3)	26	(-92, 145)	1	(-56, 58)
Income: 75K-150K & net worth: >250K	-2	(-3, 0.2)	22	(-88, 131)	-1	(-54, 52)
Income: >150K & net worth: < 500K	-2	(-4, 0.2)	49	(-68, 166)	10	(-46, 67)
Income: >150K & net worth: >= 500K	1	(-0.7, 3)	66	(-49, 181)	41	(-16, 97)
Subscriber race-ethnicity and language						
(ref=white, any language)						
Asian, English	-1	(-4, 2)	152	(-59, 364)	61	(-39, 161)
Asian, other language	-2	(-5, 1)	122	(-120, 363)	42	(-71, 155)
Black, any language	-1	(-3, 4)	-44	(-151,63)	-30	(-81, 20)
Hispanic, English	-0.9	(-3, 1)	41	(-94, 177)	12	(-52, 77)
Hispanic, other language	-0.6	(-3, 1)	194*	(21, 367)	86	(3, 168)
Other, any language	0.8	(-1, 3)	36	(-73, 145)	23	(-30, 77)
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Subscriber age (ref=45-54 years old)						
18-24	-3	(-8, 1)	-364*	(-546, -181)	-188*	(-272, -105)
25-34	-3*	(-4, -1)	-102*	(-183, -22)	-67*	(-105, -29)
35-44	-1	(-2, 0.2)	-27*	(-92, 38)	-19	(-50, 13)
55-64	-0.03	$(-1.2, \overline{1})$	12	(-61, 86)	6	(-30, 42)
65+	-8*	(-10, -6)	74	(-118, 265)	-34	(-192, 46)
Subscriber relationship (ref=single)						

	Difference in	n the probability	Difference in the level of		Difference in level of		
	of any ba	alance billing	balance billing among family-		balance billing among all		
	(n=6	6,648) ^{a,b}	years with ar	ny balance billing ^{a,c}	family-years ^{a,d}		
			(n=	=31,165)	(n=	(n=66,648)	
	Percentage	95% CI	\$	95% CI	\$	95% CI	
	points		50		10	(110.00)	
Domestic partner, different gender	1	(-2, 5)	-52	(-269, 164)	-13	(-119, 93)	
Domestic partner, same gender	0.2	(-4, 4)	159	(-165, 482)	10	(-114, 359)	
Spouse, different gender	1*	(0.02, 2)	-41	(-100, 1/)	-12	(-56, 25)	
Spouse, same gender	-4	(-12, 4)	-403*	(-692, -114)	-203	(-412, /1)	
Number of dependents (ref=0)							
1	1*	(1, 2)	-21	(-72, 29)	0.2	(-24, 25)	
2	2*	(1, 2)	17	(-22, 56)	20*	(1, 38)	
3	1*	(1, 2)	-42*	(-77, -8)	-10	(-27, 6)	
4+	-0.1	(-0.7, 0.4)	-24	(-60, 12)	-12	(-30, 5)	
Diagnosis							
Adjustment disorder	4*	(3, 5)	36	(-17, 89)	47*	(21, 73)	
PTSD	0.1	(-2, 2)	199*	(73, 325)	94*	(33, 155)	
Generalized anxiety disorder	3*	(2, 4)	156*	(103, 209)	99*	(72, 125)	
Obsessive compulsive disorder	7*	(5, 9)	156*	(18, 293)	137*	(62, 212)	
Panic disorder	-0.2	(-2, 2)	-166*	(-255, -77)	-79*	(-122, -36)	
Phobia disorders	6*	(3, 8)	134	(-6, 273)	110*	(36, 184)	
Attention deficit hyperactivity disorder	3*	(1, 5)	-85	(-209, 39)	-19	(-81, 43)	
Other child behavioral health disorders	5*	(3, 7)	-50	(-171, 71)	10	(-52, 71)	
Pervasive developmental disorder	8*	(5, 10)	597*	(380, 814)	377*	(257, 497)	
Bipolar disorder	2*	(1, 3)	26	(-36, 87)	26	(-4, 57)	
Depression	4*	(3, 4)	115*	(61, 168)	80*	(54, 106)	
Personality disorder	1	(-2, 4)	251*	(25, 477)	124	(13, 235)	
Schizophrenia	-9*	(-11, -7)	-102*	(-201, -4)	-110*	(-150, -69)	
Alcohol use disorder	0.2	(-1, 2)	814*	(658, 971)	383*	(306, 459)	
Drug use disorder	6*	(5, 8)	1763*	(1539, 1988)	944*	(824, 1265)	
Other behavioral health disorders	3*	(2, 4)	188*	(117, 259)	112*	(76, 148)	

SES: Socioeconomic status; ref: Reference group

*P<0.05

a: All models also controlled for subscriber employer characteristics (size, industry, region, etc.), unknown income and net worth \leq \$150K and unknown income and net worth \geq 150K, and calendar year. Regressions used a two-part model for total family-year balance billing and marginal effects were generated using the margins command in STATA.

b: Part 1 of the two-part model used logistic regression to determine the probability of having any balance billing. c: Part 2 of the two-part model used a gamma regression to determine the average difference in the level of balance billing among SES sample family-years with any balance billing.

d: The combined parts 1 and 2 report the average difference in the level of balance billing among all family-years in the SES sample, unconditional on whether or not they had any balance billing.

	Balance billing by member in	
	family-year ^{a,b}	
	Marginal effect	95% CI
	(\$)	
Plan characteristics		
Carve-out status (versus Carve-in)	235*	(173, 297)
HMO (versus non-HMO)	70*	(45, 95)
Provider supply		
Short-term hospital beds per 10K people	2	(-0.6, 4)
Psychiatric hospitals per 10K people	3	(-664, 669)
In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people	-2*	(-3, -1)
Subscriber highest level of educational attainment (ref= Bachelor's degree or higher)		
High school or lower	-68*	(-87, -49)
Some college	-59*	(-74, -44)
Associates degree	-51*	(-69, -34)
Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)		
Income: <75K & net worth: 25K-100K	-9	(-39, 20)
Income: $<75K$ & net worth: $>=100K$	-2	(-29, 26)
Income: 75K-150K & net worth: <100K	-3	(-31, 25)
Income: 75K-150K & net worth: 100K-250K	-3	(-30, 23)
Income: 75K-150K & net worth: >250K	-7	(-32, 18)
Income: >150K & net worth: < 500K	-3	(-29, 23)
Income: >150K & net worth: >= 500K	9	(-17, 35)
		· · · · · ·
Subscriber race-ethnicity and language (ref=white, any language)		
Asian, English	25	(-19, 70)
Asian, other language	23	(-29, 75)
Black, any language	-13	(-36, 9)
Hispanic, English	4	(-25, 33)
Hispanic, other language	36	(-1, 72)
Other, any language	11	(-13, 36)
Subscriber age (ref=45-54 years old)		
18-24	-68*	(-111, -25)
25-34	-16	(-34, 2)
35-44	-3	(-18, 11)
55-64	6	(-10, 22)
65+	-7	(-44, 30)
Subscriber relationship (ref=single)		
Domestic partner, different gender	-105*	(-143, -68)
Domestic partner, same gender	-71*	(-126, -16)
Spouse, different gender	-103*	(-118, -88)
Spouse, same gender	-168*	(-213, -123)
Number of dependents (ref=0)		
1	-55*	(-67, -44)
2	-42*	(-51, -33)

Web Appendix Table 7. Differences in balance billing by member in family-year, by subscriber and family characteristics, using trimmed balance billing values (n=66,648)

	Balance billing by member in	
	family-y	/ear ^{a,b}
	Marginal effect	95% CI
	(\$)	
3	-54*	(-62, -46)
4+	-57*	(-66, -49)
Diagnosis-type/s in family		
Adjustment disorder	19*	(8, 31)
PTSD	46*	(18, 74)
Generalized anxiety disorder	44*	(32, 55)
Obsessive compulsive disorder	55*	(22, 88)
Panic disorder	-36*	(-56, -17)
Phobia disorders	53*	(19, 87)
Attention deficit hyperactivity disorder	-8	(-36, 20)
Other child behavioral health disorders	-3	(-30, 24)
Pervasive developmental disorder	167*	(112, 221)
Bipolar disorder	14*	(0.4, 28)
Depression	37*	(26, 49)
Personality disorder	69*	(16, 122)
Schizophrenia	-51*	(-69, -33)
Alcohol use disorder	174*	(139, 209)
Drug use disorder	417*	(362, 472)
Other behavioral health disorders	50*	(33, 66)

*P<0.05

1: All models also control for subscriber employer characteristics (size, industry, region, etc.) whether or not plans are an HMO, unknown income and net worth < \$150K and unknown income and net worth >= 150K, and calendar years. Marginal effects are generated using the margins command in STATA.

2: Models used a two-part model for total family-year balance billing. Part 1 of the two-part model uses logit to determine the probability of having any balance billing. Part 2 of the two-part model uses a gamma regression to determine the average change in balance-billing level among those with any balance billing. The results reported here combined parts 1 and 2 to report the change in balance-billing level among the full sample, unconditional on whether they had any balance billing.

Web Appendix Table 8. Differences in adjusted balance billing by subscriber and family characteristics, sensitivity analysis controlling for whether diagnoses occurred alone or together with other behavioral health diagnoses, using trimmed balance billing values (n=66,648)

Marginal effect (\$) 95% C1 Carrecoutt stams (versus Carve-in) 371* (310, 433) HMO (versus non-HMO) 147* (95, 199) Provider supply 4 (-0.3, 8) Byschiatric hospitals beds per 10K people -10 (-1398, 1378) In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5% (-111, -20) High school or lower -147* (-190, -105) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) -147* (-190, -105) Subscriber income and net worth (ref= Income: <75K & net worth: <25K) - - Subscriber income and net worth (ref= Income: <75K & net worth: <25K) - - Income: 75K A ent worth: 25K-100K 13 (-45, 79) Income: 75K A ent worth: 25K-100K 13 (-42, 63) Income: 75K X & net worth: 250K 10 (-44, 20) Income: 75K X & net worth: 250K 10 (-44, 20, 20) Income: 75K X & net worth: 250K 10 (-44, 20, 20) Income: 75K & net worth: 250K 10 (-44, 20, 20) Income: 75K A ent worth: 250K 26 <th></th> <th colspan="2">Total family-year balance billing^{a,b}</th>		Total family-year balance billing ^{a,b}	
Plan characteristics		Marginal effect (\$)	95% CI
Carre-out status (versus non-HMO) 147* (310, 433) HVMO (versus non-HMO) 147* (95, 199) Provider supply - - Short-term hospital beds per 10K people 4 (40.3, 8) Provider supply - - In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -10 (-1398, 1378) In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5* (-111, -20) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) - - High school or lower -126* (-156, -96) - Some college -107* (-144, -70) - Subscriber income and net worth (ref= Income: <75K & net worth: <25K)	Plan characteristics		
HMO (versus non-HMO) 147* (95, 199) Provider supply 4 (-0.3, 8) Short-term hospital bed per 10K people -10 (-1.398, 1.378) In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5° (-111, -20) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) - - High school or lower -126* (-156, -96) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) - - Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)	Carve-out status (versus Carve-in)	371*	(310, 433)
Provider supply Provider supply Short-term hospital beds per 10K people 4 $(4.3, 8)$ Psychiatric hospitals per 10K people -10 $(-1398, 1378)$ In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5* $(-111, -20)$ Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) -107* $(-141, -20)$ High school or lower $-126*$ $(-156, -96)$ -107* $(-144, -70)$ Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)	HMO (versus non-HMO)	147*	(95, 199)
Provider supply (-0.3, 8) Short-term hospital beds per 10K people 4 (-0.3, 8) Psychiatric hospitals per 10K people -10 (-1398, 1378) In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5* (-111, -20) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) High school or lower -147* (-190, -105) Some college -126* (-146, -96) (-144, -70) (-144, -70) Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)			
Short-term hospital best per 10K people 4 (-0.3, 8) Psychiatric hospitals per 10K people -10 (-1398, 1378) In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5° (-111, -20) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) -147* (-190, -105) High school or lower -126* (-156, -96) Associates degree -107* (-144, -70) Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)	Provider supply		
Pychiatric hospitals per 10K people -10 (-1398,1378) In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5* (-111, -20) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) -147* (-190, -105) Sume college -147* (-190, -105) -147* (-190, -105) Some college -126* (-164, -70) -107* (-144, -70) Subscriber income and net worth (ref= Income: <75K & net worth: 25K)	Short-term hospital beds per 10K people	4	(-0.3, 8)
In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people -5^* (-111, -20) Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) - - High school or lower -147* (-190, -105) Some college -126* (-156, -96) Associates degree -107* (-144, -70) Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)	Psychiatric hospitals per 10K people	-10	(-1398, 1378)
Subscriber highest level of educational attainment (ref= Bachelor's degree or higher) Image: Control of the second	In-network behavioral health providers (MD, PhD, MSW, RN) per 10K people	-5*	(-111, -20)
Subscriber highest level of educational attainment (ref= Bachelor's degree or higher)			
High school or lower -147* (-190, -105) Some college -126* (-156, -96) Associates degree -107* (-144, -70) Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)	Subscriber highest level of educational attainment (ref= Bachelor's degree or higher)		
Some college -126^* $(-156, -96)$ Associates degree -107^* $(-144, -70)$ Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)	High school or lower	-147*	(-190, -105)
Associates degree -107^* $(-144, -70)$ Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)	Some college	-126*	(-156, -96)
Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K) (-0.5) Income: <75K & net worth: 25K-100K	Associates degree	-107*	(-144, -70)
Subscriber income and net worth (ref= Income: <75K & net worth: <<= 25K)		10,	(11., 70)
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Subscriber income and net worth (ref= Income: <75K & net worth: <= 25K)		
Income: $<75K$ & net worth: $<100K$ 13 $(.45, 70)$ Income: $75K-150K$ & net worth: $<100K$ 33 $(.27, 93)$ Income: $75K-150K$ & net worth: $>250K$ 16 $(.40, 72)$ Income: $>150K$ & net worth: $>250K$ 10 $(.42, 62)$ Income: $>150K$ & net worth: $>500K$ 26 $(.29, 81)$ Income: $>150K$ & net worth: $>= 500K$ 54 $(.02, 108)$ Subscriber race-ethnicity and language (ref=white, any language) 59 $(.23, 141)$ Asian, English 59 $(.23, 141)$ Black, any language -21 $(.73, 31)$ Hispanic, other language 76* $(12, 141)$ Other, any language 24 $(.23, 3.94)$ 18-24 -233* $(.373, .94)$ 25-34 -15 $(.44, 14)$ 55-64 -0.2 $(.23, 32)$ 65+ -20 $(.98, 57)$ Subscriber relationship (rcf=single) -16 $(.116, 85)$ Domestic partner, different gender -17 $(.43, 9)$ Spouse, different gender -17 $(.43, 9)$ Spouse, same gender -274* $(.514, .34)$ </td <td>Income: <75K & net worth: 25K-100K</td> <td>-0.5</td> <td>(-64, 63)</td>	Income: <75K & net worth: 25K-100K	-0.5	(-64, 63)
Income: 75K-150K & net worth: 100K 33 $(-27, 93)$ Income: 75K-150K & net worth: 250K 16 $(40, 72)$ Income: 75K-150K & net worth: >250K 10 $(42, 62)$ Income: >150K & net worth: > 500K 26 $(-22, 81)$ Income: >150K & net worth: > 500K 54 $(-0.2, 108)$ Subscriber race-ethnicity and language (ref=white, any language) 54 $(-0.2, 108)$ Asian, English 59 $(-23, 141)$ Asian, other language Black, any language 21 $(-73, 31)$ Hispanic, other language 76* $(12, 141)$ Other, any language 24 $(-24, 73)$ Hispanic, other language 24 $(-24, 73)$ Subscriber age (ref=45-54 years old) -15 $(-44, 14)$ 25-34 -65^* $(-10, -26)$ 35-44 -15 $(-44, 14)$ 25-354 -0.2 $(-32, 32)$ 65^+ -0.2 $(-32, 32)$ 65^+ -15 $(-104, -26)$ $35-44$ -15 $(-144, 14)$ $55-64$ -0.2 $(-32, 32)$ 0	Income: $< 75K$ & net worth: $>=100K$	13	(-45, 70)
Income: 75K-150K & net worth: 100K-250K 16 $(-40, 72)$ Income: 75K-150K & net worth: >250K 10 $(-42, 62)$ Income: >150K & net worth: >500K 26 $(-29, 81)$ Income: >150K & net worth: >500K 54 $(-0, 2, 108)$ Subscriber race-ethnicity and language (ref=white, any language) 54 $(-0, 2, 108)$ Asian, English 59 $(-23, 141)$ Asian, english 59 $(-23, 141)$ Hispanic, other language -21 $(-73, 31)$ Hispanic, other language 76* $(12, 141)$ Other, any language 24 $(-24, 73)$ Hispanic, other language 24 $(-24, 73)$ Subscriber age (ref=45.54 years old) -23.3* $(-373, .94)$ 18-24 -23.3* $(-373, .94)$ 25.34 -15 $(-44, 14)$ 55.64 -0.2 $(-32, 32)$ 65+ -20 $(-98, 57)$ Domestic partner, same gender -16 $(-116, 85)$ Domestic partner, different gender -16 $(-116, 85)$ Domestic partner, same gender -274* $(-514, -34)$	Income: 75K-150K & net worth: <100K	33	(-27, 93)
Income: 75K-150K & net worth: >250K 10 $(.42, 62)$ Income: >150K & net worth: < 500K	Income: 75K-150K & net worth: 100K-250K	16	(-40, 72)
Income: >150K & net worth: < 500K	Income: 75K-150K & net worth: >250K	10	(-42, 62)
Income: >150K & net worth: >= 500K 21 $(27, 210)$ Subscriber race-ethnicity and language (ref=white, any language) 54 $(-2, 210)$ Asian, English 59 $(-23, 141)$ Asian, other language 44 $(-53, 141)$ Black, any language -21 $(-73, 31)$ Hispanic, English 16 $(-43, 75)$ Hispanic, other language 76* $(12, 141)$ Other, any language 24 $(-24, 73)$ Subscriber age (ref=45-54 years old) 1 1 18-24 -233* $(-373, -94)$ 25-34 -65* $(-104, -26)$ 35-44 -15 $(-44, 14)$ 55-64 -0.2 $(-32, 32)$ 65+ -20 $(-98, 57)$ Domestic partner, different gender -16 $(-116, 85)$ Domestic partner, same gender 40 $(-79, 160)$ Spouse, same gender -17 $(-43, 9)$ Spouse, same gender -274* $(-514, -34)$ Mumber of dependents (ref=0) 1 $(-514, -34)$ 1 0.5 $(-22, 24)$ 2	Income: $>150K$ & net worth: $< 500K$	26	(-29, 81)
Subscriber race-ethnicity and language (ref=white, any language) 51 (53, 100) Asian, English 59 (-23, 141) Asian, other language 44 (-53, 141) Black, any language -21 (-73, 31) Hispanic, English 16 (-43, 75) Hispanic, other language 70* (12, 141) Other, any language 24 (-24, 73) Subscriber age (ref=45-54 years old) 24 (-24, 73) 18-24 -233* (-373, -94) 25-34 -65* (-104, -26) 35-44 -15 (-44, 14) 55-64 -0.2 (-32, 32) 65+ -20 (-98, 57) Subscriber relationship (ref=single)	Income: $\geq 150K$ & net worth: $\geq 500K$	54	(-0.2, 108)
Subscriber race-ethnicity and language (ref=white, any language) $(-23, 141)$ Asian, English 59 $(-23, 141)$ Asian, other language 44 $(-53, 141)$ Black, any language -21 $(-73, 31)$ Hispanic, English 16 $(443, 75)$ Hispanic, other language 76^* $(12, 141)$ Other, any language 24 $(-24, 73)$ Hisparic, other language 24 $(-24, 73)$ Subscriber age (ref=45-54 years old) -233^* $(-373, -94)$ 18-24 -233^* $(-373, -94)$ 25-34 -65^* $(-104, -26)$ 35-44 -15 $(-44, 14)$ 55-64 -0.2 $(-32, 32)$ 65^+ -200 $(-98, 57)$ Domestic partner, different gender -16 $(-116, 85)$ Domestic partner, different gender -17 $(-43, 9)$ Spouse, different gender -17 $(-43, 9)$ Spouse, same gender -274^* $(-514, -34)$ Number of dependents (ref=0) -1			(0.2, 100)
Asian, English 59 $(-23, 141)$ Asian, other language 44 $(-53, 141)$ Black, any language -21 $(-73, 31)$ Hispanic, English 16 $(-43, 75)$ Hispanic, other language 76* $(12, 141)$ Other, any language 24 $(-24, 73)$ Subscriber age (ref=45-54 years old) - - Subscriber age (ref=45-54 years old) - - 18-24 -233* $(-373, -94)$ 25-34 -65* $(-104, -26)$ 35-44 -15 $(-44, 14)$ 55-64 -0.2 $(-32, 32)$ 65+ -200 $(-98, 57)$ Subscriber relationship (ref=single) - Domestic partner, different gender -16 $(-116, 85)$ Domestic partner, same gender -274* $(-43, 9)$ Spouse, different gender -274* $(-514, -34)$ Spouse, same gender -274* $(-514, -34)$ 1 0.5 $(-22, 24)$ 2 18 $(0.03, 35)$ 3 -10 $(-25, 5)$ <td>Subscriber race-ethnicity and language (ref=white, any language)</td> <td></td> <td></td>	Subscriber race-ethnicity and language (ref=white, any language)		
Asian other language 44 $(-33, 141)$ Black, any language -21 $(-73, 31)$ Hispanic, English 16 $(-43, 75)$ Hispanic, other language 76* $(12, 141)$ Other, any language 24 $(-24, 73)$ Subscriber age (ref=45-54 years old)	Asian, English	59	(-23, 141)
Black, any language -21 $(-73, 31)$ Hispanic, English 16 $(-43, 75)$ Hispanic, other language 76* $(12, 141)$ Other, any language 24 $(-24, 73)$ Subscriber age (ref=45-54 years old) - - 18-24 -233* $(-373, -94)$ 25-34 -65* $(-104, -26)$ 35-44 -15 $(44, 14)$ 55-64 -0.2 $(-32, 32)$ 65+ -20 $(-98, 57)$ Domestic partner, different gender -16 $(-116, 85)$ Domestic partner, same gender -17 $(-43, 9)$ Spouse, different gender -17 $(-43, 9)$ Spouse, same gender -20 $(-79, 160)$ 1 0.5 $(-22, 24)$ 2 18 $(0.03, 35)$ 3 -10 $(-25, 5)$	Asian, other language	44	(-53, 141)
Hispanic, English 16 (-43, 75) Hispanic, other language 76* (12, 141) Other, any language 24 (-24, 73) Subscriber age (ref=45-54 years old) - - 18-24 -233* (-373, -94) 25-34 -65* (-104, -26) 35-44 -15 (-44, 14) 55-64 -0.2 (-32, 32) 65+ -200 (-98, 57) Subscriber relationship (ref=single) - Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender -40 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) 1 0.5 (-22, 24) 1 0.5 (-22, 24) 1 0.5 (-22, 24) 1 18 (0.03, 35) 3 -10 (-22, 5)	Black, any language	-21	(-73, 31)
Hispanic, other language 76^* $(12, 141)$ Other, any language 24 $(-24, 73)$ Subscriber age (ref=45-54 years old) -233^* $(-373, -94)$ $18-24$ -233^* $(-373, -94)$ $25-34$ -65^* $(-104, -26)$ $35-44$ -15 $(-44, 14)$ $55-64$ -0.2 $(-32, 32)$ $65+$ -200 $(-98, 57)$ Subscriber relationship (ref=single) -16 $(-116, 85)$ Domestic partner, different gender -16 $(-116, 85)$ Domestic partner, same gender 400 $(-79, 160)$ Spouse, different gender -274^* $(-514, -34)$ Number of dependents (ref=0) 1 0.5 $(-22, 24)$ 1 0.5 $(-22, 24)$ 18 $(0.03, 35)$ 3 -100 $(-25, 5)$ -10 $(-25, 5)$	Hispanic, English	16	(-43, 75)
Other, any language 24 (-24, 73) Subscriber age (ref=45-54 years old) -233* (-373, -94) 18-24 -233* (-373, -94) 25-34 -65* (-104, -26) 35-44 -15 (-44, 14) 55-64 -0.2 (-32, 32) 65+ -200 (-98, 57) Subscriber relationship (ref=single) -200 Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender 400 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	Hispanic, other language	76*	(12, 141)
Subscriber age (ref=45-54 years old) (-373, -94) 18-24 -233* (-373, -94) 25-34 -65* (-104, -26) 35-44 -15 (-44, 14) 55-64 -0.2 (-32, 32) 65+ -20 (-98, 57) Subscriber relationship (ref=single) -20 (-98, 57) Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender 40 (-79, 160) Spouse, adifferent gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	Other, any language	24	(-24, 73)
Subscriber age (ref=45-54 years old)			(= 1, 7 =)
18-24 -233* (-373, -94) 25-34 -65* (-104, -26) 35-44 -15 (-44, 14) 55-64 -0.2 (-32, 32) 65+ -20 (-98, 57) Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender 40 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	Subscriber age (ref=45-54 years old)		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	18-24	-233*	(-373, -94)
35-44 -15 (-44, 14) 55-64 -0.2 (-32, 32) 65+ -20 (-98, 57) Subscriber relationship (ref=single) -16 (-116, 85) Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender 40 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	25-34	-65*	(-104, -26)
55-64 -0.2 (-32, 32) 65+ -20 (-98, 57) Subscriber relationship (ref=single)	35-44	-15	(-44, 14)
65+ -20 (-98, 57) Subscriber relationship (ref=single)	55-64	-0.2	(-32, 32)
Subscriber relationship (ref=single) -16 (-116, 85) Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender 40 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) Number of dependents (ref=0) 0.5 (-22, 24) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	65+	-20	(-98, 57)
Subscriber relationship (ref=single) -16 (-116, 85) Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender 40 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) Number of dependents (ref=0) 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)			
Domestic partner, different gender -16 (-116, 85) Domestic partner, same gender 40 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) Number of dependents (ref=0) 0.5 (-22, 24) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	Subscriber relationship (ref=single)		
Domestic partner, same gender 40 (-79, 160) Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) Number of dependents (ref=0) 0.5 (-22, 24) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	Domestic partner, different gender	-16	(-116, 85)
Spouse, different gender -17 (-43, 9) Spouse, same gender -274* (-514, -34) Number of dependents (ref=0)	Domestic partner, same gender	40	(-79, 160)
Spouse, same gender -274* (-514, -34) Number of dependents (ref=0) -274* -274* 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	Spouse, different gender	-17	(-43, 9)
Number of dependents (ref=0) 0.5 (-22, 24) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)	Spouse, same gender	-274*	(-514, -34)
Number of dependents (ref=0) 0.5 (-22, 24) 1 0.5 (-22, 24) 2 18 (0.03, 35) 3 -10 (-25, 5)			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Number of dependents (ref=0)		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	0.5	(-22, 24)
3 -10 (-25, 5)	2	18	(0.03, 35)
	3	-10	(-25, 5)

	Total family-year balance billing ^{a,b}	
	Marginal effect (\$)	95% CI
4+	-19*	(-36, -3)
Diagnosis		
Adjustment disorder only	-66*	(-111, -20)
Adjustment disorder and at least one other diagnosis	63*	(34, 92)
PTSD only	-130	(-506, 246)
PTSD and at least one other diagnosis	57*	(8, 106)
Generalized anxiety disorder only	1	(-51, 53)
Generalized anxiety disorder and at least one other diagnosis	86*	(58, 113)
Obsessive compulsive disorder only	-23	(-168, 122)
Obsessive compulsive disorder and at least one other diagnosis	107*	(50, 165)
Panic disorder only	-99*	(-149, -49)
Panic disorder and at least one other diagnosis	-	-
Phobia disorders only	-48	(-264, 168)
Phobia disorders and at least one other diagnosis	88*	(30, 145)
Attention deficit hyperactivity disorder only	-	-
Attention deficit hyperactivity disorder and at least one other diagnosis	-55	(-121, 12)
Other child behavioral health disorders only	-206*	(-330, -82)
Other child behavioral health disorders and at least one other diagnosis	20	(-45, 84)
Pervasive developmental disorder only	284*	(155, 414)
Pervasive developmental disorder and at least one other diagnosis	211*	(146, 276)
Bipolar disorder only	-129*	(-227, -32)
Bipolar disorder and at least one other diagnosis	24	(-7, 54)
Depression only	-0.1	(-53, 53)
Depression and at least one other diagnosis	53*	(23, 84)
Personality disorder only	84	(-447, 615)
Personality disorder and at least one other diagnosis	93*	(13, 174)
Schizophrenia only	-215*	(-401, -28)
Schizophrenia and at least one other diagnosis	-118*	(-170, -67)
Alcohol use disorder only	668*	(532, 805)
Alcohol use disorder and at least one other diagnosis	232	(181, 283)
Drug use disorder only	891*	(764, 1018)
Drug use disorder and at least one other diagnosis	523*	(466, 579)
Other behavioral health disorders only	-113*	(-198, -28)
Other behavioral health disorders and at least one other diagnosis	123*	(91, 155)

a: All models also control for subscriber employer characteristics (size, industry, region, etc.), unknown income and net worth < \$150K and unknown income and net worth >= 150K and calendar years. Marginal effects are generated using the margins command in STATA.

b: Models used a two-part model for total family-year balance billing. Part 1 of the two-part model uses logit to determine the probability of having any balance billing. Part 2 of the two-part model uses a gamma regression to determine the average change in balance-billing level among those with any balance billing. The results reported here combined parts 1 and 2 to report the change in balance-billing level among the full sample, unconditional on whether they had any balance billing.