

Supplemental Data for

"Time Trends in Emergency Department Use among Adults with Intellectual and Developmental Disabilities"

This document shows:

1) Demographic characteristics subdivided by the following state policy categories:

- Table S1: Transition to care (yes, no)
- Table S2: Medicaid expansion (none, waiver, full)
- Table S3: Health care reform (none, modest, major)

2) Full regression results for the following specifications and outcomes:

- Table S4: Overall trends, total ED visits
- Table S5: Overall trends, inpatient ED visits
- Table S6: Overall trends, outpatient ED visits
- Table S7: Managed care transition, total ED visits
- Table S8: Managed care transition, inpatient ED visits
- Table S9: Managed care transition, outpatient ED visits
- Table S10: Medicaid expansion, total ED visits
- Table S11: Medicaid expansion, inpatient ED visits
- Table S12: Medicaid expansion, outpatient ED visits
- Table S13: Health care reform, total ED visits
- Table S14: Health care reform, inpatient ED visits
- Table S15: Health care reform, outpatient ED visits

Table S1. Demographic characteristics of Medicaid members ages 18–64 years with intellectual and developmental disabilities at beginning and end of study period, by whether or not states transitioned to managed care — eight US states, 2010–2016^a

	No Transition		Transition During Study Period	
	2010 N (%)	2016 N (%)	2010 N (%)	2016 N (%)
Gender				
Female	4360 (44.9)	11,726 (41.6)	19,420 (44.1)	24,110 (40.2)
Male	5351 (55.1)	16,473 (58.4)	24,620 (55.9)	35,803 (59.8)
Age (years)				
18–29	5128 (52.8)	16,591 (58.8)	26,144 (59.6)	36,475 (60.9)
30–39	1905 (19.6)	5544 (19.7)	8124 (18.4)	11,742 (19.6)
40–49	1292 (13.3)	2685 (9.5)	5316 (12.1)	5452 (9.1)
50–64	1386 (14.3)	3379 (12.0)	4456 (10.1)	6245 (10.4)
Race				
White	4169 (42.9)	13,677 (48.5)	25,178 (57.2)	32,631 (54.5)
Black	3544 (36.4)	8121 (28.8)	8824 (20.0)	11,607 (19.4)
Other	1573 (16.2)	4057 (14.4)	6922 (15.7)	9965 (16.6)
Unknown ^b	4442 (4.5)	2369 (8.4)	3166 (7.1)	5711 (9.5)
Ethnicity				
Hispanic	27 (0.3)	324 (1.1)	6825 (15.5)	9935 (16.6)
Non-Hispanic	1560 (16.1)	17,006 (60.3)	36,048 (81.9)	47,764 (79.7)
Unknown ^b	8123 (83.7)	10,869 (83.7)	1167 (2.6)	2215 (3.7)

^aEnrollment increases from 2010 to 2016 reflect the addition of one state in 2013, as well as increases within each state.

^bSome states did not have race and/or ethnicity data recorded.

Table S2. Demographic characteristics of Medicaid members ages 18–64 years with intellectual and developmental disabilities at beginning and end of study period, by state Medicaid expansion status — eight US states, 2010–2016^a

	No Expansion		Expansion via Waiver		Full Expansion under ACA	
	2010 N (%)	2016 N (%)	2010 N (%)	2016 N (%)	2010 N (%)	2016 N (%)
Gender						
Female	4401 (44.6)	5617 (40.9)	2732 (46.4)	9640 (41.6)	16,648 (43.8)	20,579 (40.2)
Male	5475 (55.4)	8108 (59.1)	3159 (53.6)	13,510 (58.4)	21,337 (56.2)	30,659 (59.8)
Age (years)						
18–29	5639 (57.1)	8440 (61.5)	3492 (59.3)	13,744 (59.4)	22,141 (58.3)	30,882 (60.3)
30–39	1964 (19.9)	2843 (20.7)	1033 (17.5)	4642 (20.1)	7033 (18.5)	9800 (19.1)
40–49	1145 (11.6)	1159 (8.4)	693 (11.8)	2102 (9.1)	4771 (12.6)	4877 (9.5)
50–64	1129 (11.4)	1283 (9.3)	672 (11.4)	2662 (11.5)	4040 (10.6)	5679 (11.1)
Race						
White	4617 (46.7)	6196 (45.1)	4746 (80.3)	14,961 (64.6)	19,984 (52.6)	25,151 (49.1)
Black	3788 (38.4)	3919 (28.5)	187 (3.2)	4846 (20.9)	8393 (22.1)	10,964 (21.4)
Other	1398 (14.2)	3458 (25.2)	312 (5.3)	884 (3.8)	6785 (17.9)	9679 (18.9)
Unknown ^b	73 (0.7)	152 (1.1)	662 (11.2)	2483 (10.7)	2823 (7.4)	5444 (10.6)
Ethnicity						
Hispanic	114 (1.2)	254 (1.8)	76 (1.3)	437 (1.9)	6662 (17.5)	9568 (18.7)
Non-Hispanic	2002 (20.3)	3479 (25.3)	5158 (87.6)	21,534 (93.0)	30,449 (80.2)	39,758 (77.6)
Unknown ^b	7760 (78.6)	9992 (72.8)	657 (11.1)	1179 (5.1)	873 (2.3)	1912 (3.7)

^aEnrollment increases from 2010 to 2016 reflect the addition of one state in 2013, as well as increases within each state.

^bSome states did not have race and/or ethnicity data recorded.

Table S3. Demographic characteristics of Medicaid members ages 18–64 years with intellectual and developmental disabilities at beginning and end of study period, by Medicaid policy implementation category — eight US states, 2010–2016^a

	No Applicable Policy Change		Modest/Targeted Reform		Major Reform	
	2010	2016	2010	2016	2010	2016
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Gender						
Female	3447 (44.8)	10,561 (41.6)	3686 (45.6)	4696 (40.9)	16,648 (43.8)	20,597 (40.2)
Male	4240 (55.2)	14,822 (58.4)	4394 (54.4)	6796 (59.1)	21,337 (56.2)	30,659 (59.8)
Age (years)						
18–29	4180 (54.4)	15,041 (59.3)	4952 (61.3)	7143 (62.2)	22,141 (58.3)	30,882 (60.3)
30–39	1546 (20.1)	5056 (19.9)	1450 (17.9)	2430 (21.1)	7033 (18.5)	9800 (19.1)
40–49	971 (12.6)	2356 (9.3)	867 (10.7)	896 (7.8)	4771 (12.6)	4877 (9.5)
50–64	990 (12.9)	2922 (11.5)	811 (10.0)	1024 (8.9)	4040 (10.6)	5679 (11.1)
Race						
White	2783 (36.2)	19,984 (48.0)	6580 (81.3)	8966 (77.8)	19,984 (52.6)	25,151 (49.1)
Black	3537 (46.0)	8393 (32.0)	438 (5.4)	654 (5.7)	8393 (22.1)	10,964 (21.4)
Other	1366 (17.8)	6785 (15.0)	344 (4.2)	528 (4.6)	6785 (17.9)	9679 (18.9)
Unknown ^b	0 (0.0)	2823 (5.0)	735 (9.1)	1369 (11.9)	2823 (7.4)	5444 (10.6)
Ethnicity						
Hispanic	0 (0.0)	287 (1.1)	190 (2.3)	404 (3.5)	6662 (17.5)	9568 (18.7)
Non-Hispanic	0 (0.0)	15,292 (60.2)	7160 (88.6)	9721 (84.6)	30,449 (80.2)	39,758 (77.6)
Unknown ^b	7687 (100)	9804 (38.6)	731 (9.0)	1367 (11.9)	873 (2.3)	873 (3.7)

^aEnrollment increases from 2010 to 2016 reflect the addition of one state in 2013, as well as increases within each state.

^bSome states did not have race and/or ethnicity data recorded.

Table S4: Regression results for overall state trends, total ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	76.81***	9.22	97.97***	5.28	199.23	142.08
Time	0.25	0.33	0.45	0.27	-0.31	0.93
State 2			0.16***	0.00	-18.84	20.64
State 3			-12.55***	0.08	-34.00	20.35
State 4			-24.64***	3.51	-49.60**	16.18
State 5			-20.76***	4.00	-48.45	31.79
State 6			-11.20*	4.62	-51.27	36.45
State 7			-52.50***	5.01	-71.26***	17.86
State 8			-83.80***	4.37	-114.28**	35.91
Age 30-39 (percent)					217.22	262.96
Age 40-49 (percent)					-385.78	394.85
Age 50-64 (percent)					-2.41	223.37
Female (percent)					-160.40	296.62

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S5: Regression results for overall state trends, inpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	10.31***	2.59	14.18***	1.42	67.28	34.40
Time	-0.03	0.09	-0.03	0.10	-0.33*	0.16
State 2			-0.27***	0.00	-6.41	7.98
State 3			-1.28***	0.13	-7.16	4.59
State 4			-0.44	0.40	-8.12	4.80
State 5			-5.42***	0.41	-13.11	9.60
State 6			-8.12***	0.56	-20.47*	10.19
State 7			-4.84***	0.90	-9.63	5.76
State 8			-11.68***	0.58	-18.10	11.61
Age 30-39 (percent)					103.02*	52.02
Age 40-49 (percent)					-49.74	76.83
Age 50-64 (percent)					-18.44	66.02
Female (percent)					-127.96**	48.64

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S6: Regression results for overall state trends, outpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	66.70***	7.55	84.26***	5.35	149.88	116.50
Time	0.28	0.30	0.48*	0.21	0.02	0.74
State 2			-0.04***	0.00	-13.42	13.78
State 3			-11.75***	0.02	-26.86	13.99
State 4			-23.76***	3.30	-44.60***	12.34
State 5			-15.81**	5.18	-35.61	23.05
State 6			-3.55	6.22	-30.35	30.61
State 7			-48.14***	7.03	-62.08***	15.05
State 8			-72.59***	6.22	-95.84**	29.20
Age 30-39 (percent)					83.96	190.03
Age 40-49 (percent)					-309.20	309.82
Age 50-64 (percent)					14.62	186.89
Female (percent)					-66.16	264.25

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S7: Regression results for managed care transition, total ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	88.08***	4.45	98.98***	7.44	210.27	143.01
Time	-0.13	0.67	0.38	0.57	-0.23	1.05
MC transition: yes	-19.81	16.53	-1.65	15.19	-10.67	38.78
Time x MC transition: yes	0.63	0.71	0.13	0.62	-0.24	0.70
State 3			-12.55***	0.00	-28.78	31.29
State 4			-24.64***	5.56	-45.29**	16.82
State 5			-20.92***	0.00	-27.68*	11.96
State 6			-11.37	9.56	-29.58	24.94
State 7			-52.09***	11.02	-67.24**	22.54
State 8			-83.96***	9.68	-91.77***	17.09
Age 30-39 (percent)					221.01	228.99
Age 40-49 (percent)					-364.41	443.17
Age 50-64 (percent)					46.58	286.32
Female (percent)					-221.12	211.71

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:*

Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S8: Regression results for managed care transition, inpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	15.53***	2.46	15.98***	2.10	65.48*	28.45
Time	-0.19	0.15	-0.15	0.16	-0.34	0.17
MC transition: yes	-9.16*	3.73	-3.50	4.23	-7.74	8.01
Time x MC transition: yes	0.27	0.17	0.22	0.17	0.04	0.16
State 3			-1.28***	0.00	-8.02	5.50
State 4			-0.44	0.58	-8.82	4.53
State 5			-5.15***	0.00	-7.01**	2.11
State 6			-7.85**	2.41	-14.52***	4.21
State 7			-4.09**	1.26	-10.29	5.23
State 8			-11.41***	3.09	-12.29**	4.26
Age 30-39 (percent)					102.40*	46.94
Age 40-49 (percent)					-53.22	71.38
Age 50-64 (percent)					-26.43	68.92
Female (percent)					-118.07**	44.79

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S9: Regression results for managed care transition, outpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	73.02***	4.25	83.47***	6.99	164.23	119.41
Time	0.06	0.60	0.53	0.48	0.11	0.87
MC transition: yes	-11.13	13.54	1.38	13.80	-2.80	28.08
Time x MC transition: yes	0.37	0.64	-0.10	0.51	-0.31	0.52
State 3			-11.75***	0.00	-20.07	25.74
State 4			-23.76***	5.23	-39.00**	12.74
State 5			-15.78***	0.00	-19.68*	8.85
State 6			-3.52	7.21	-13.23	19.54
State 7			-48.47***	10.08	-56.85***	16.70
State 8			-72.56***	6.74	-77.65***	13.81
Age 30-39 (percent)					88.89	188.50
Age 40-49 (percent)					-281.42	349.65
Age 50-64 (percent)					78.31	232.18
Female (percent)					-145.09	196.53

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:*

Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S10: Regression results for Medicaid expansion, total ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	76.30***	3.94	75.63***	8.68	152.62	94.07
Time	1.13**	0.39	1.13**	0.42	0.54	0.63
Medicaid expansion: waiver	-20.60	25.92	21.50	22.40	22.95	38.96
Medicaid expansion: full	13.73**	4.93	29.65**	9.63	30.95	17.01
Time x Medicaid expansion: waiver	-0.80	0.68	-0.62	0.73	-0.96	0.68
Time x Medicaid expansion: full	-1.17**	0.42	-1.17**	0.43	-1.07**	0.39
State 4			-24.80***	0.00	-31.78***	3.07
State 5			-20.92	11.90	-22.53	18.17
State 6			1.35***	0.00	-1.24	11.31
State 7			-52.85***	1.68	-48.03*	22.55
State 8			-83.80***	21.95	-79.72	53.56
Age 30-39 (percent)					94.05	189.57
Age 40-49 (percent)					-394.68*	193.50
Age 50-64 (percent)					252.63	255.35
Female (percent)					-172.76	224.00

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S11: Regression results for Medicaid expansion, inpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	7.74	4.81	11.16*	4.79	59.76**	21.93
Time	0.09	0.15	0.09	0.15	-0.17	0.14
Medicaid expansion: waiver	-0.94	6.29	1.49	5.55	1.96	14.39
Medicaid expansion: full	6.67	5.97	5.02	5.99	3.15	8.86
Time x Medicaid expansion: waiver	-0.01	0.19	-0.01	0.18	-0.07	0.21
Time x Medicaid expansion: full	-0.28	0.22	-0.28	0.22	-0.19	0.16
State 4			-0.17***	0.00	-2.37	1.74
State 5			-5.15***	0.08	-4.62	3.61
State 6			-6.84***	0.00	-9.07***	2.57
State 7			-5.47***	0.17	-4.43	7.88
State 8			-11.68***	2.29	-9.32	13.40
Age 30-39 (percent)					61.50	65.92
Age 40-49 (percent)					-23.28	52.49
Age 50-64 (percent)					32.08	78.64
Female (percent)					-134.19**	41.94

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S12: Regression results for Medicaid expansion, outpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	68.57***	8.29	64.47***	8.10	111.77	94.55
Time	1.03***	0.20	1.03**	0.33	0.75	0.49
Medicaid expansion: waiver	-19.50	21.88	20.39	19.89	17.93	26.01
Medicaid expansion: full	7.43	9.12	24.69*	10.91	27.16	16.59
Time x Medicaid expansion: waiver	-0.79	0.53	-0.60	0.48	-0.85	0.52
Time x Medicaid expansion: full	-0.90*	0.37	-0.90*	0.44	-0.93*	0.42
State 4			-23.72***	0.00	-31.98***	2.42
State 5			-15.78	10.89	-16.23	16.79
State 6			8.19***	0.00	10.09	7.86
State 7			-47.90***	1.47	-42.21**	16.09
State 8			-72.59***	20.08	-66.49	41.23
Age 30-39 (percent)					-18.68	133.28
Age 40-49 (percent)					-322.24*	133.66
Age 50-64 (percent)					233.93	203.11
Female (percent)					-76.06	220.10

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S13: Regression results for health care reform, total ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	82.97***	9.47	81.37***	6.15	167.91	97.78
Time	-0.27	0.72	0.73	0.74	0.32	1.01
Health care reform: large	7.06	10.80	23.91*	11.65	23.58	23.59
Health care reform: small	-22.21	19.36	11.06	21.58	6.08	28.41
Time x Health care reform: large	0.23	0.85	-0.77	0.86	-0.74	0.90
Time x Health care reform: small	1.11	0.79	0.10	0.90	-0.04	0.95
State 4			-24.80***	0.00	-34.18***	5.47
State 5			-20.92	11.90	-19.52	20.33
State 6			-11.20***	0.00	-3.01	28.48
State 7			-41.63***	1.01	-43.14***	4.15
State 8			-83.80***	4.87	-73.58	37.81
Age 30-39 (percent)					13.10	246.85
Age 40-49 (percent)					-211.39	344.90
Age 50-64 (percent)					205.00	358.37
Female (percent)					-196.20	248.06

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S14: Regression results for health care reform, inpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	14.44***	3.20	14.33***	1.74	65.03**	22.12
Time	-0.20	0.11	-0.12	0.08	-0.32*	0.15
Health care reform: large	-0.03	4.50	1.85	3.68	0.45	5.56
Health care reform: small	-9.70**	3.31	-2.99	4.30	0.49	8.98
Time x Health care reform: large	0.01	0.18	-0.06	0.16	-0.03	0.17
Time x Health care reform: small	0.37***	0.08	0.29***	0.07	0.19	0.16
State 4			-0.17***	0.00	-4.05***	1.19
State 5			-5.15***	0.08	-5.15	3.37
State 6			-8.12***	0.00	-13.33	9.07
State 7			-2.96***	0.03	-2.93**	1.11
State 8			-11.68**	3.57	-13.01	14.07
Age 30-39 (percent)					42.92	56.71
Age 40-49 (percent)					-19.71	62.71
Age 50-64 (percent)					8.02	95.18
Female (percent)					-127.05*	50.86

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

Table S15: Regression results for health care reform, outpatient ED visits

Variable	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Intercept	68.53***	6.15	67.04***	7.00	121.37	88.67
Time	-0.08	0.70	0.85	0.69	0.68	0.89
Health care reform: large	7.46	7.03	22.12*	10.63	22.68	16.87
Health care reform: small	-12.42	16.28	14.46	18.80	3.24	24.92
Time x Health care reform: large	0.21	0.74	-0.72	0.75	-0.76	0.79
Time x Health care reform: small	0.75	0.78	-0.19	0.77	-0.22	0.84
State 4			-23.72***	0.00	-32.69***	4.36
State 5			-15.78	10.89	-12.86	17.80
State 6			-3.55***	0.00	14.49	20.34
State 7			-38.66***	0.82	-41.05***	3.63
State 8			-72.59***	1.54	-57.17*	25.73
Age 30-39 (percent)					-78.32	188.35
Age 40-49 (percent)					-151.05	288.85
Age 50-64 (percent)					211.18	279.91
Female (percent)					-105.09	228.16

Source: Authors' analysis of 2010-2016 Medicaid claims and enrollment data from states participating in this study. *Notes:* Std. Error: Standard error.

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$