

## Established outpatient care and follow-up after acute psychiatric service use in youth and young adults

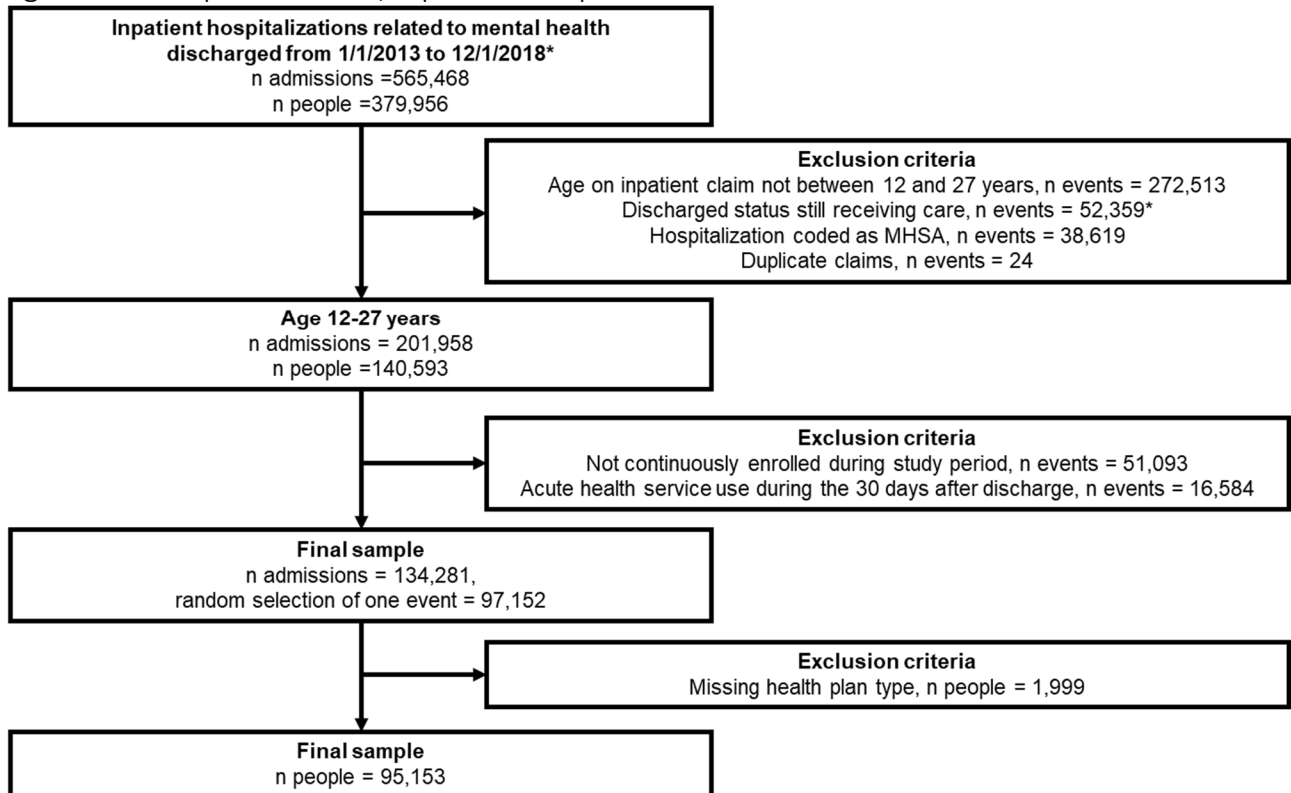
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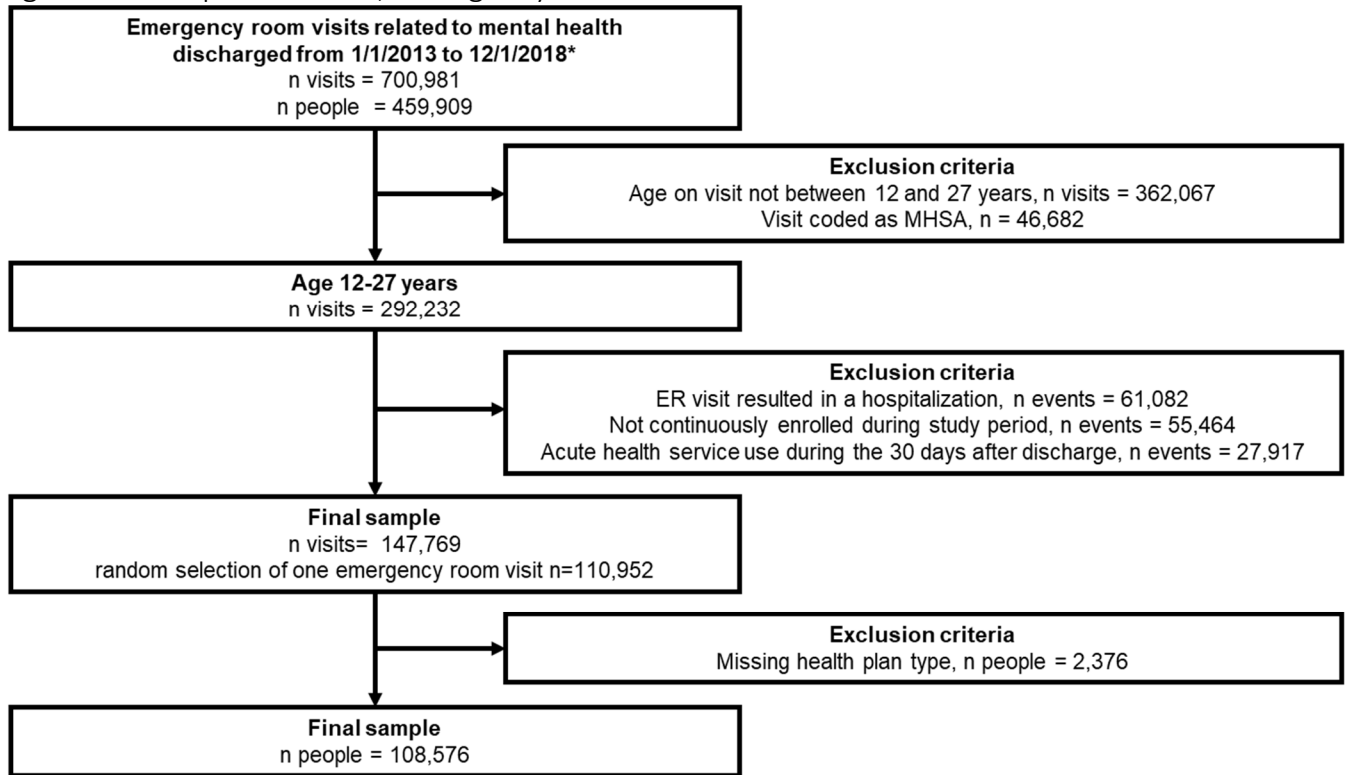
Figure S1. Sample selection, inpatient hospitalization



\*Mental health diagnosis: defined as schizophrenia, other psychotic disorders, bipolar disorder, post-traumatic stress disorder, major depressive disorder, anxiety disorders (generalized anxiety disorder, separation anxiety disorder, specific or social phobia), disruptive disorders (conduct disorders and intermittent explosive disorder), suicide-related (suicide attempt, self-harm), co-morbid substance use disorder, and co-morbid eating disorders

\*Transferred to another facility (n=14,884), still a patient (n=12,050), other (n=103), missing (n=25,322)

Figure S2. Sample selection, emergency room use



\*Mental health diagnosis: defined as schizophrenia and other psychotic disorders, bipolar disorder, post-traumatic stress disorder, major depressive disorder, anxiety disorders (including generalized anxiety disorder, separation anxiety disorder, specific or social phobia), disruptive disorders (conduct disorders, intermittent explosive disorder, oppositional defiant disorder), suicide-related (suicide attempt, self-harm), co-morbid substance use disorder, and co-morbid eating disorders

## Supplementary Tables – Methods

Table S1. Stakeholder Engagement, key organizations

<b>Organization</b>	<b>Description</b>
Young Adult Advisory Board	A virtual, stakeholder advisory board developed by the Transitions to Adulthood Research Center at UMass Chan Medical School. The mission of the Young Adult Advisory Board is to incorporate the young adult perspective and voice into research. This board is comprised of around 12 young adults (18-30 years) with serious mental health conditions. During our meetings, there was representation from Massachusetts, California, Idaho, Florida, New York, New Mexico, and New Jersey.
The National Federation of Families	A national, family-run organization that advocates and offers families a voice in the formation of national policy, services, and supports for their children.
Got Transition <sup>®</sup>	From the National Alliance to Advance Adolescent Health, Got Transition <sup>®</sup> aims to improve transition from pediatric to adult health care through the use of evidence-driven strategies for health care professionals, youth, young adults, and their families.
Mental Health America	A long-standing, community-based nonprofit dedicated to addressing the needs of those living with mental illness and promoting the overall mental health of all.
Commonwealth Medicine	A team of experts who partner with public and private health and human services entities with a focus on health law and policy, children and families, research and evaluation, survey research, health care workforce assessment and development.
Care Management team at Reliant Medical Group	Reliant Medical Group is the largest independent medical group in Central and MetroWest, MA. The Care Management Team works to connect patients and their families who have challenging medical and/or behavioral needs to the services they need.

Table S2. Emergency room use identification

Description	Codes Used
Emergency Room Claims	<p><i>Revenue Codes (revcode):</i> 0450-0459 (Emergency Room) or 0981 (Professional Fees, Emergency Room)</p> <p><i>Or Place of Service Codes (stdplac):</i> 23 (Emergency Room, Hospital)</p> <p><i>Or CPT Codes (proc1):</i> 99281-99285 (Emergency department visit for the evaluation and management of a patient)</p> <p><i>Or Service Sub-Category Code (svscat):</i> Any code that ends in a 20 indicates an emergency room visit 10120, 10220, 10320, 10420, 10520 – Facility inpatient ER 20220 – Physician Non-Specialty inpatient ER 12220 – Facility outpatient ER 21220 – Physician Non-Specialty outpatient ER 20120 – Physician Specialty inpatient ER 22320 – Professional outpatient ER 21120 – Physician Specialty outpatient ER 22120 – Professional inpatient ER 30120, 30220, 30520, 30620, 30320, 30420 – Mental Health ER 31120, 31220, 31320, 31420, 31520, 31620 – Substance Abuse ER</p>
<p><b>Applied to IBM® MarketScan® Commercial Database, Outpatient Services Table</b></p>	
<p><i>*Adapted from Voss et al.<sup>1</sup></i></p>	

Table S3. ICD codes to identify mental health diagnosis

<b>Mental health diagnosis</b>	<b>ICD-9 Codes</b>	<b>ICD-10 Codes</b>
Schizophrenia*	295.00-295.95	F20*, F25*
Other psychotic disorders*	298.1, 298.3-298.4, 298.8-298.9	F23, F28, F29
Bipolar disorder*	296.0-296.1, 296.4-296.9	F30*, F31*
Depressive disorders*	296.2-296.3, 298.0, 300.4	F32*, F33*, F34.1
Anxiety disorders and phobias*	300.0, 300.2, 309.21	F40*, F41*, F93.0
Post-traumatic stress disorder*	309.81	F43.1
Disruptive disorders* (conduct disorders and intermittent explosive disorder)	312.1-312.2, 312.34, 312.4-312.9	F91*, F63.81
Self-harm/ suicide attempt**	V62.84, E950-E958.9	R45.851, T14.91, All T and X specific to intentional self-harm codes with a 7 <sup>th</sup> character of A indicating "initial encounter". <sup>2</sup>
Co-morbid disorders	<i>(Next page)</i>	<i>(Next page)</i>

\* Applied to the to the primary diagnosis code on the Inpatient Admissions Table and to the first diagnosis code on the Outpatient Services Table

\*\* Applied to the to the 15 diagnosis codes on the Inpatient Admissions Table and to the 4 diagnosis codes on the Outpatient Services Table

Substance use** <sup>3-5</sup>	291.0-291.9, 292.0-292.9, 303.0-303.9, 304.01-304.93, 305.01-305.93, 357.5, 425.5, 535.3, 571.1-571.3, 648.3, 965.01-965.09, 968.5, 969.6, E850.0, E854.1, E860.0, E935.0, E938.5, E939.6, V654.2	F10.10, F10.12*, F10.14-F10.92*, F10.94-F10.99, F11.10, F11.12*, F11.14-F11.99, F12.10, F12.12*, F12.15*-F12.22*, F12.25*-F12.92*, F12.95*-F12.99, F13.10, F13.12*, F13.14-F13.20, F13.22*-F13.99, F14.10, F14.12*, F14.14-F14.99, F15.10, F15.12*, F15.14-F15.20, F15.22*-F15.99, F16.10, F16.12*, F16.14-F16.99, F18.10, F18.12*-F18.99, F19.10, F19.12*, F19.14-F19.99, F55.0-F55.8, G62.1, I42.6, K29.2*, K70*, O35.4XX*-O35.5XX*, O99.31*-O99.32*, T40.0X1A, T40.0X3A, T40.0X4A, T40.0X5A, T40.1X1A, T40.1X3A, T40.1X4A, T40.2X1A, T40.2X3A, T40.2X4A, T40.2X5A, T40.3X1A, T40.3X3A, T40.3X4A, T40.3X5A, T40.4X1A, T40.4X3A, T40.4X4A, T40.4X5A, T40.5X1A, T40.5X3A, T40.5X4A, T40.5X5A, T40.601A, T40.603A, T40.604A, T40.605A, T40.691A, T40.693A, T40.694A, T40.695A, T407X1A, T407X3A, T407X4A, T407X5A, T408X1A, T408X3A, T408X4A, T40901A, T40903A, T40904A, T40905A, T40991A, T40993A, T40994A, T40995A, T43601A, T43603A, T43604A, T43605A, T43621A, T43623A, T43624A, T43625A, T43631A, T43633A, T43634A, T43635A, T43691A, T43693A, T43694A, T43695A, Z726
Eating disorders**	307.1, 307.5	F50*

\* Applied to the to the primary diagnosis code on the Inpatient Admissions Table and to the first diagnosis code on the Outpatient Services Table

\*\* Applied to the to the 15 diagnosis codes on the Inpatient Admissions Table and to the 4 diagnosis codes on the Outpatient Services Table

Table S4. Operational definition of outpatient mental health visit and outpatient primary care visit

Description	Codes Used
Outpatient Mental Healthcare Claim	<p><i>Provider Type Codes (stdprov):</i>            21 (Mental health facilities) or 365 (Psychiatry) or 458 (Child psychiatry) or 824 (Psychiatric nurse) or 853 (Supportive therapist) or 860 (Psychologist)</p> <p><i>And Place of service codes (stdplac):</i>            11 (Office) or 12 (Patient Home) or 19 (Outpatient Hospital, off campus) or 22 (Outpatient Hospital, on campus) or 50 (Federally Qualified Health Center) or 95 (Outpatient, Not Elsewhere Classified)</p> <p><i>And CPT Codes (proc1)<sup>5,6</sup>:</i>            99201-99205 or 99211-99215 or 99241-99245 or 90791-90792 or 90832-90834 or 90836-90840 or 90846 or 90847 or 90849 or 90853 or 90887 or 90845 or 90865 or 90867 or 90868 or 90869 or 90870 or 90875 or 90876 or 90880 or 90882 or 90885 or 90889 or 90899 or 90901 or 90911</p> <p><i>Or Service Sub-Category Code (svscat):</i>            30524 (Mental Health Physician OP Preventive Visits) or 30525 (Mental Health Physician OP Office Visits) or 30624 (Mental Health Professional OP Preventive Visits) or 30625 (Mental Health Professional OP Office Visits) or 30630 (Mental Health Professional OP Diagnostic Services) or 30518 (Mental Health Physician OP Behavioral Health Therapy) or 30618 (Mental Health Professional OP Behavioral Health Therapy)</p> <p><i>Or Place of service codes (stdplac):</i>            52 (Psych Facility Partial Hospitalization) or 53 (Community Mental Health Center)</p>
Outpatient Primary Care Claim	<p><i>Provider Type Codes (stdprov):</i>            204 (Internal Medicine) or 240 (Family Practice) or 400 (Pediatrician) or 822 (Nursing Services) or 825 (Nurse Practitioner) or 845 (Physician assistant)</p> <p><i>And Place of service codes (stdplac):</i>            11 (Office) or 12 (Patient Home) or 19 (Outpatient Hospital, off campus) or 22 (Outpatient Hospital, on campus) or 50 (Federally Qualified Health Center) or 95 (Outpatient, Not Elsewhere Classified)</p> <p><i>And CPT Codes (proc1)<sup>7</sup>:</i>            99201-99205 or 99211-99215 or 99218-99220 or 99224-99226 or 99241-99245 or 99304-99345 or 99347-99350 or 99354-99357 or 99374-99384 or 99391-99394 or 99401-99412 or 99420 or 99429 or 99455-99456 or 99432 or 99460 or 99461</p>
<p><b>Applied to IBM® MarketScan® Commercial Database, Outpatient Services Table; separate variables created based on date of service (svcdte)</b></p>	



Table S5. Operational definition of substance use based on treatment codes

Description	Codes Used
Substance use treatment	<p><i>Provider Type Codes (stdprov):</i>            20 (Mental health/ chemical dep, Not Elsewhere Classified) or 22 (Chemical depend treatment ctr) or 23 (Mental health/ chem dep day care)</p> <p><i>Or Place of Service Codes (stdplac):</i>            55 (Residential Subst Abuse Facil) or 57 (Non-Resident Subst Abuse Facil)</p> <p><i>Or CPT Codes (proc1)<sup>9</sup>:</i>            99408-99409</p> <p><i>Or Service Sub-Category Code (svscat):</i>            31110-31769 (Substance abuse facility, physician, or professional)            Excluding: 31120, 31220, 31320, 31420, 31520, 31620 (Substance use ER)</p>
<b>Applied to IBM® MarketScan® Commercial Database, Outpatient Services Table</b>	

## Supplementary Tables – Additional Analysis

Table S6. Outpatient health care engagement prior to hospitalization for mental health, 2013-2018

	Primary care and mental health care	Mental health care only	Primary care only	None
	<i>Percent</i>			
Age, years				
12-13	42.4	26.6	15.9	15.2
14-15	41.9	27.4	15.3	15.5
16-17	41.0	26.7	15.4	17.0
18-19	29.4	30.4	15.0	25.2
20-21	26.3	31.4	13.7	28.6
22-23	25.7	31.0	13.7	29.6
24-25	27.9	30.3	13.8	28.1
26-27	32.0	30.9	13.9	23.2
Sex				
Male	27.4	31.5	13.4	27.8
Female	38.2	27.4	15.6	18.9
Health plan type				
Basic/ major medical/ comprehensive	32.6	25.3	18.0	24.1
Preferred provider organization	34.1	28.8	14.9	22.2
High-deductible/ consumer-driven	34.4	28.5	14.8	22.3
All other health plans*	30.8	31.4	13.3	24.6
Pediatric medical complexity				
Non-chronic	28.5	31.1	13.9	26.5
Non-complex chronic	38.4	27.6	15.5	18.6
Complex chronic	46.4	23.8	16.2	13.6
Left against medical advice				
No	33.5	29.2	14.6	22.7
Yes	29.9	26.0	17.4	26.7
Length of stay, days				
3 or less	30.5	26.5	16.7	26.2
4 to 6	33.8	28.7	15.2	22.3
7 to 10	35.3	30.6	13.2	20.9
11 or more	35.4	34.0	10.8	19.9
Primary reason for admission				
Schizophrenia	22.6	42.1	7.8	27.5
Bipolar disorder	36.0	33.6	11.3	19.1
Major depression	34.6	27.2	16.0	22.2
Anxiety disorders/ Phobias	42.2	25.5	14.7	17.6

Post-traumatic stress disorder	42.5	28.5	13.4	15.5
Other psychotic disorders	20.3	29.1	13.9	36.7
Disruptive disorders	37.9	29.2	14.4	18.5
Substance-use related (co-morbid)	25.8	25.4	18.2	30.6
Eating disorders (co-morbid)	56.9	27.4	10.3	5.4
Self-harm/ suicide-related event				
No	32.8	30.1	13.6	23.5
Yes	33.9	28.5	15.4	22.2

\*All other health plans include: exclusive provider organization, health maintenance organization, point-of-service

Table S7. Outpatient health care engagement prior to emergency room use for mental health, 2013-2018

	Primary care and mental health care	Mental health care only	Primary care only	None
	<i>Percent</i>			
Age, years				
12-13	34.0	19.6	25.4	21.1
14-15	34.7	20.8	23.8	20.8
16-17	33.6	20.1	23.9	22.5
18-19	23.3	21.1	22.4	33.3
20-21	20.2	21.2	21.0	37.6
22-23	21.0	20.6	20.6	37.8
24-25	21.0	21.6	20.7	36.7
26-27	22.4	18.3	23.8	35.5
Sex				
Male	22.2	22.3	19.8	35.7
Female	28.5	19.4	24.2	27.9
Health plan type				
Basic/ major medical/ comprehensive	25.9	18.9	25.1	30.1
Preferred provider organization	26.7	20.4	23.0	29.9
High-deductible/ consumer-driven	26.4	19.2	22.8	31.6
All other health plans*	22.9	22.7	20.0	34.4
Pediatric medical complexity				
Non-chronic	21.4	21.8	20.7	36.1
Non-complex chronic	33.0	18.8	26.1	22.2
Complex chronic	42.6	15.9	26.7	14.8
Primary reason for admission				
Schizophrenia	23.4	37.8	8.8	30.0
Bipolar disorder	32.5	31.2	13.7	22.6
Major depression	30.3	23.8	19.3	26.6
Anxiety disorders/ Phobias	21.8	16.1	26.9	35.2
Post-traumatic stress disorder	34.9	26.5	16.6	21.9
Other psychotic disorders	19.1	23.6	18.3	39.1
Disruptive disorders	34.0	25.6	17.8	22.6
Substance-use related (co-morbid)	24.4	21.7	20.0	33.9
Eating disorders (co-morbid)	56.2	26.8	8.5	8.5
Self-harm/ suicide-related event				
No	24.6	20.0	23.1	32.3
Yes	29.3	22.6	20.2	27.9

\*All other health plans include: exclusive provider organization, health maintenance organization, point-of-service

Table S8. Factors associated with any follow-up after hospitalization for mental health, 2013-2018

	7 days			30 days		
	follow-up (%)	aOR	95% CI	follow-up (%)	aOR	95% CI
Established outpatient healthcare engagement						
Primary care and mental health care	56.4	2.90	2.77-3.04	83.5	4.12	3.84-4.42
Mental health care only	50.8	2.47	2.36-2.59	77.7	3.09	2.90-3.28
Primary care only	36.4	1.36	1.30-1.43	65.0	1.61	1.51-1.71
None	28.2	<i>Reference</i>		51.6	<i>Reference</i>	
Age, years						
12-13	53.1	<i>Reference</i>		80.1	<i>Reference</i>	
14-15	53.0	0.98	0.93-1.04	80.5	1.01	0.96-1.07
16-17	49.9	0.90	0.85-0.95	77.8	0.90	0.84-0.97
18-19	43.5	0.79	0.74-0.85	69.8	0.71	0.65-0.79
20-21	40.3	0.74	0.69-0.79	66.3	0.66	0.60-0.72
22-23	39.7	0.76	0.70-0.82	64.7	0.66	0.60-0.74
24-25	39.1	0.74	0.69-0.80	63.5	0.63	0.57-0.69
26-27	44.7	0.88	0.80-0.95	70.4	0.80	0.69-0.92
Sex						
Male	41.2	<i>Reference</i>		67.2	<i>Reference</i>	
Female	48.7	1.14	1.12-1.17	75.4	1.20	1.16-1.23
Plan type						
Basic/ major medical/ comprehensive	40.8	0.88	0.71-1.11	65.1	0.77	0.57-1.04
Preferred provider organization	45.8	1.09	0.95-1.25	72.2	1.09	0.93-1.29
High-deductible/consumer-driven	46.7	1.10	0.98-1.24	73.5	1.11	0.98-1.27
All other health plans	43.9	<i>Reference</i>		70.1	<i>Reference</i>	
Pediatric medical complexity						
Non-chronic	44.2	<i>Reference</i>		70.8	<i>Reference</i>	
Non-complex chronic	47.0	1.04	1.01-1.08	73.4	1.03	1.00-1.07
Complex chronic	48.0	1.07	1.03-1.12	73.7	1.03	0.98-1.08
Length of stay, days						
3 or less	40.9	<i>Reference</i>		67.2	<i>Reference</i>	
4 to 6	47.0	1.19	1.13-1.25	73.9	1.24	1.18-1.30
7 to 10	48.8	1.25	1.18-1.32	74.9	1.28	1.20-1.37
11 or more	44.6	1.10	1.03-1.18	69.7	1.10	1.03-1.18
Left against medical advice						
No	45.6	<i>Reference</i>		72.0	<i>Reference</i>	
Yes	37.0	0.93	0.81-1.06	59.0	0.78	0.69-0.89
Primary reason for admission						

Schizophrenia	40.3	0.83	0.75-0.92	65.8	0.81	0.73-0.89
Bipolar disorder	45.4	0.86	0.83-0.89	72.1	0.82	0.78-0.86
Major depression	48.8	<i>Reference</i>		75.9	<i>Reference</i>	
Anxiety/ Phobias	48.4	0.95	0.89-1.01	74.5	0.89	0.81-0.97
Post-traumatic stress disorder	44.5	0.75	0.68-0.83	71.5	0.68	0.59-0.78
Other psychotic disorders	41.5	0.96	0.89-1.03	68.9	1.05	0.96-1.15
Disruptive disorders	36.8	0.58	0.51-0.67	67.3	0.59	0.50-0.69
Substance-use related (co-morbid)	29.6	0.57	0.51-0.62	51.6	0.48	0.45-0.51
Eating disorders (co-morbid)	56.7	1.06	0.93-1.20	77.0	0.74	0.62-0.88
Self-harm/ suicide-related event						
No	42.9	<i>Reference</i>		68.4	<i>Reference</i>	
Yes	47.3	1.06	1.01-1.10	74.4	1.09	1.04-1.13

\*Overall prevalence of any follow-up: 45.4% within 7 days, 71.8% within 30 days

Table S9. Factors associated with any follow-up after emergency room use for mental health, 2013-2018

	7 days			30 days		
	follow-up (%)	aOR	95% CI	follow-up (%)	aOR	95% CI
<b>Established outpatient healthcare engagement</b>						
Primary care and mental health care	50.4	3.80	3.53-4.08	76.8	5.52	5.17-5.89
Mental health care only	42.4	2.94	2.72-3.18	67.5	3.75	3.50-4.02
Primary care only	28.4	1.59	1.51-1.68	50.1	1.81	1.72-1.90
None	19.0	<i>Reference</i>		34.0	<i>Reference</i>	
<b>Age, years</b>						
12-13	42.9	<i>Reference</i>		66.7	<i>Reference</i>	
14-15	43.3	0.99	0.92-1.05	66.6	0.97	0.90-1.04
16-17	39.9	0.88	0.83-0.93	62.9	0.85	0.79-0.91
18-19	30.0	0.66	0.62-0.71	50.8	0.62	0.58-0.66
20-21	29.2	0.67	0.62-0.72	49.4	0.62	0.58-0.67
22-23	29.2	0.67	0.63-0.72	49.6	0.63	0.60-0.67
24-25	30.6	0.73	0.68-0.79	50.9	0.68	0.63-0.73
26-27	33.2	0.81	0.75-0.87	55.0	0.79	0.74-0.85
<b>Sex</b>						
Male	32.2	<i>Reference</i>		52.9	<i>Reference</i>	
Female	35.4	0.99	0.96-1.02	57.5	1.02	0.99-1.04
<b>Plan type</b>						
Basic/ major medical/ comprehensive	33.8	1.05	0.90-1.23	55.7	1.05	0.86-1.28
Preferred provider organization	34.6	1.08	0.98-1.19	56.2	1.08	0.96-1.21
High-deductible/consumer-driven	34.3	1.06	0.97-1.16	56.1	1.09	0.99-1.20
All other health plans	32.3	<i>Reference</i>		53.4	<i>Reference</i>	
<b>Pediatric medical complexity</b>						
Non-chronic	32.6	<i>Reference</i>		53.3	<i>Reference</i>	
Non-complex chronic	36.7	1.06	1.03-1.09	59.4	1.10	1.06-1.15
Complex chronic	39.0	1.11	1.06-1.16	63.5	1.21	1.16-1.26
<b>Primary reason for admission</b>						
Schizophrenia	29.0	0.73	0.61-0.88	51.5	0.77	0.65-0.92
Bipolar disorder	36.2	0.87	0.79-0.95	61.1	0.98	0.89-1.08
Major depression	40.6	1.10	1.04-1.16	64.0	1.18	1.12-1.24
Anxiety/ Phobias	32.1	<i>Reference</i>		52.3	<i>Reference</i>	
Post-traumatic stress disorder	42.7	1.14	0.91-1.43	61.8	0.99	0.83-1.19
Other psychotic disorders	28.2	0.83	0.74-0.93	49.4	0.90	0.81-1.00
Disruptive disorders	34.0	0.70	0.65-0.76	57.6	0.74	0.67-0.82

Substance-use related (co-morbid)	24.1	0.60	0.57-0.64	43.0	0.59	0.56-0.61
Eating disorders (co-morbid)	51.0	1.27	0.95-1.68	72.6	1.17	0.81-1.69
Self-harm/ suicide-related event						
No	32.9	<i>Reference</i>		53.9	<i>Reference</i>	
Yes	37.4	1.11	1.04-1.18	60.3	1.17	1.11-1.23

\*Overall prevalence of any follow up: 34.1% within 7 days, 55.5% within 30 days



Table S10. Factors associated with mental health follow-up within 7 days of hospitalization for mental health, by age group (2013-2018)

	Age 12-13 years (n=6,854)		Age 14-15 years (n=15,067)		Age 16-17 years (n=17,416)		Age 18-19 years (n=14,242)		Age 20-21 years (n=13,716)		Age 22-23 years (n=12,512)		Age 24-25 years (n=11,318)		Age 26-27 years (4,028)	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
<b>Established outpatient healthcare engagement</b>																
Primary care and mental health care	3.27	2.83-3.78	2.96	2.70-3.26	2.95	2.76-3.16	2.90	2.57-3.27	2.63	2.36-2.92	2.53	2.32-2.76	2.62	2.35-2.91	3.03	2.52-3.65
Mental health care only	2.63	2.20-3.15	2.62	2.36-2.90	2.65	2.49-2.82	2.52	2.27-2.81	2.67	2.36-3.02	2.40	2.15-2.69	2.75	2.52-3.00	2.58	2.14-3.11
Primary care only	1.32	1.09-1.58	1.17	1.02-1.34	1.23	1.11-1.37	1.24	1.11-1.38	1.09	0.97-1.23	1.17	1.03-1.32	1.23	1.07-1.40	1.38	1.13-1.69
None	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
<b>Female</b>	1.06	0.95-1.19	1.01	0.94-1.08	1.14	1.08-1.21	1.09	1.02-1.17	1.19	1.12-1.27	1.24	1.15-1.32	1.19	1.10-1.28	1.26	1.12-1.42
<b>Plan type</b>																
Basic/ major medical/ comprehensive	0.82	0.61-1.12	0.70	0.50-0.98	0.78	0.55-1.11	0.81	0.61-1.10	1.01	0.73-1.40	0.78	0.57-1.07	0.90	0.69-1.17	1.23	0.87-1.73
Preferred provider organization	1.08	0.92-1.26	0.96	0.80-1.16	1.12	0.97-1.28	1.06	0.92-1.22	1.13	0.95-1.33	1.04	0.88-1.23	1.05	0.87-1.26	1.27	0.98-1.64
High-deductible/consumer-driven	1.09	0.90-1.32	0.98	0.82-1.17	1.11	0.95-1.27	1.05	0.88-1.24	1.14	0.99-1.32	1.12	0.97-1.29	1.12	0.93-1.37	1.04	0.81-1.35
All other health plans	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
<b>Pediatric medical complexity</b>																
Non-chronic	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
Non-complex chronic	1.02	0.95-1.09	1.04	0.95-1.14	1.03	0.96-1.11	0.97	0.87-1.08	1.00	0.91-1.11	1.03	0.95-1.11	1.00	0.89-1.12	0.92	0.78-1.08
Complex chronic	0.96	0.81-1.15	1.06	0.95-1.18	1.14	1.02-1.26	0.98	0.91-1.07	0.99	0.89-1.11	0.97	0.87-1.08	0.97	0.86-1.10	0.86	0.71-1.04
<b>Length of stay, days</b>																
3 or less	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
4 to 6	1.22	1.06-1.40	1.15	1.03-1.28	1.23	1.14-1.32	1.19	1.08-1.32	1.21	1.13-1.31	1.21	1.10-1.33	1.25	1.12-1.39	1.03	0.90-1.19
7 to 10	1.29	1.12-1.50	1.13	1.02-1.25	1.24	1.14-1.34	1.26	1.13-1.41	1.42	1.23-1.65	1.33	1.17-1.52	1.23	1.07-1.42	0.99	0.84-1.16
11 or more	0.96	0.81-1.15	0.89	0.78-1.02	0.91	0.82-1.02	1.29	1.13-1.48	1.24	1.07-1.44	1.38	1.19-1.62	1.31	1.13-1.52	1.15	0.92-1.45
<b>Left against medical advice</b>	1.28	0.86-1.91	0.87	0.61-1.25	1.20	0.97-1.49	0.91	0.60-1.36	0.95	0.75-1.19	0.80	0.57-1.11	0.83	0.61-1.13	0.90	0.50-1.59
<b>Primary reason for admission</b>																
Schizophrenia	0.77	0.40-1.49	0.93	0.60-1.45	0.71	0.49-1.02	0.84	0.68-1.05	0.85	0.73-1.00	0.78	0.67-0.91	0.84	0.71-1.01	0.77	0.60-0.97
Bipolar disorder	0.92	0.78-1.08	0.71	0.65-0.78	0.74	0.68-0.79	0.88	0.80-0.96	0.92	0.85-1.00	0.93	0.83-1.05	0.91	0.81-1.02	0.91	0.78-1.05
Major depression	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
Anxiety/ Phobias	1.12	0.84-1.49	1.00	0.85-1.17	0.88	0.74-1.05	1.03	0.79-1.34	1.16	0.94-1.42	0.81	0.61-1.08	0.66	0.50-0.87	0.77	0.45-1.29
Post-traumatic stress disorder	0.59	0.38-0.94	0.81	0.63-1.04	0.78	0.58-1.05	0.77	0.50-1.19	0.78	0.56-1.09	0.61	0.39-1.01	0.56	0.36-0.88	1.62	0.87-3.02
Other psychotic disorders	0.93	0.71-1.23	1.03	0.82-1.29	1.08	0.86-1.37	1.03	0.81-1.32	0.98	0.80-1.19	0.76	0.61-0.94	0.85	0.72-1.00	1.03	0.71-1.50
Disruptive disorders	0.63	0.45-0.89	0.57	0.46-0.71	0.43	0.33-0.55	0.57	0.31-1.05	0.51	0.22-1.19	0.97	0.55-1.71	0.73	0.25-2.13	6.76	0.76-60.06
Substance-use related (co-morbid)	0.73	0.31-1.72	0.67	0.50-0.90	0.54	0.43-0.69	0.51	0.43-0.61	0.45	0.40-0.51	0.42	0.36-0.49	0.47	0.40-0.55	0.42	0.31-0.57
Eating disorders (co-morbid)	1.47	0.90-2.41	1.07	0.78-1.48	1.30	0.95-1.77	0.87	0.61-1.24	0.56	0.33-0.93	1.07	0.70-1.63	0.75	0.51-1.10	1.24	0.55-2.81
<b>Self-harm/ suicide-related event</b>	1.12	1.03-1.23	1.12	1.02-1.22	1.09	1.03-1.16	1.04	0.96-1.13	1.06	0.97-1.16	0.96	0.89-1.04	1.14	1.03-1.27	1.12	0.96-1.31

Table S11. Factors associated with mental health follow-up within 7 days of emergency room use for mental health, by age group (2013-2018)

	Age 12-13 years (n=7,129)		Age 14-15 years (n=13,382)		Age 16-17 years (n=16,882)		Age 18-19 years (n=17,132)		Age 20-21 years (n=17,243)		Age 22-23 years (n=15,784)		Age 24-25 years (n=14,418)		Age 26-27 years (n=6,606)	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
<b>Established outpatient healthcare engagement</b>																
Primary care and mental health care	5.59	4.69-6.67	5.37	4.59-6.27	4.57	3.87-5.39	4.14	3.68-4.66	3.84	3.47-4.24	3.70	3.33-4.10	3.49	3.06-3.97	3.32	2.79-3.95
Mental health care only	4.12	3.36-5.05	4.53	3.85-5.34	3.52	2.95-4.21	4.12	3.58-4.75	3.56	3.19-3.99	3.31	2.97-3.68	3.10	2.73-3.53	2.61	2.23-3.05
Primary care only	1.38	1.15-1.65	1.39	1.21-1.59	1.37	1.20-1.55	1.32	1.20-1.46	1.23	1.10-1.37	1.18	1.03-1.35	1.00	0.89-1.12	1.11	0.92-1.34
None	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference	
<b>Female</b>	1.17	1.05-1.31	0.97	0.89-1.05	0.97	0.88-1.06	0.92	0.86-0.98	0.94	0.86-1.02	1.04	0.96-1.13	1.08	1.00-1.16	1.04	0.93-1.17
<b>Plan type</b>																
Basic/ major medical/ comprehensive	0.90	0.60-1.35	0.74	0.53-1.04	1.05	0.81-1.36	0.71	0.53-0.95	1.03	0.78-1.35	0.89	0.63-1.24	1.22	0.84-1.78	1.27	0.83-1.96
Preferred provider organization	1.07	0.89-1.30	1.02	0.86-1.22	1.06	0.89-1.26	1.02	0.90-1.16	1.07	0.95-1.20	1.08	0.92-1.26	1.11	0.95-1.29	1.11	0.90-1.37
High-deductible/consumer-driven	1.07	0.88-1.31	1.04	0.88-1.23	1.03	0.88-1.20	1.06	0.93-1.20	1.01	0.89-1.15	1.04	0.91-1.19	1.17	1.00-1.36	0.87	0.68-1.12
All other health plans	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference	
<b>Pediatric medical complexity</b>																
Non-chronic	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference	
Non-complex chronic	0.91	0.79-1.06	1.01	0.90-1.14	1.04	0.96-1.12	1.00	0.92-1.08	0.93	0.84-1.04	1.04	0.93-1.15	1.12	0.99-1.26	0.90	0.78-1.04
Complex chronic	0.93	0.77-1.12	0.91	0.80-1.05	0.98	0.87-1.10	1.12	0.98-1.28	0.91	0.83-1.01	0.92	0.81-1.04	1.09	0.99-1.19	0.93	0.79-1.09
<b>Primary reason for admission</b>																
Schizophrenia	0.26	0.03-2.46	0.94	0.51-1.73	0.78	0.47-1.28	0.76	0.47-1.23	0.94	0.74-1.20	1.15	0.83-1.60	0.83	0.67-1.04	0.83	0.58-1.20
Bipolar disorder	0.88	0.69-1.11	1.01	0.80-1.27	0.95	0.85-1.06	1.13	0.94-1.35	1.14	1.00-1.29	1.07	0.91-1.26	1.06	0.90-1.24	1.30	0.99-1.72
Major depression	1.24	1.09-1.41	1.45	1.34-1.57	1.44	1.30-1.59	1.42	1.28-1.58	1.35	1.16-1.57	1.17	1.02-1.34	1.44	1.32-1.58	1.44	1.21-1.71
Anxiety/ Phobias	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference	
Post-traumatic stress disorder	1.44	0.85-2.43	1.82	1.26-2.63	1.34	0.85-2.12	2.20	1.39-3.47	1.64	1.02-2.62	0.73	0.33-1.62	1.24	0.77-1.99	1.32	0.73-2.42
Other psychotic disorders	1.06	0.77-1.48	0.90	0.62-1.30	0.89	0.71-1.11	1.06	0.83-1.35	0.96	0.78-1.17	0.78	0.61-0.98	0.77	0.62-0.94	0.74	0.49-1.12
Disruptive disorders	0.90	0.75-1.09	0.81	0.69-0.96	0.76	0.67-0.86	0.89	0.66-1.20	1.02	0.78-1.35	1.08	0.82-1.42	0.77	0.53-1.10	0.37	0.16-0.90
Substance-use related (co-morbid)	1.12	0.67-1.86	1.12	0.94-1.34	0.76	0.64-0.90	0.59	0.50-0.70	0.59	0.51-0.69	0.51	0.42-0.60	0.62	0.54-0.72	0.53	0.40-0.69
Eating disorders (co-morbid)	0.63	0.25-1.58	1.80	0.84-3.82	1.27	0.72-2.23	1.20	0.58-2.45	2.67	1.24-5.74	1.58	0.64-3.93	1.24	0.47-3.31	1.06	0.19-6.03
<b>Self-harm/ suicide-related event</b>	1.20	1.02-1.41	1.15	1.05-1.27	1.24	1.13-1.36	1.16	1.03-1.30	1.13	0.95-1.33	1.38	1.20-1.60	1.07	0.91-1.27	1.15	0.98-1.36

Table S12. Factors associated with mental health follow-up within 7 days of hospitalization for mental health, by primary diagnosis coded on acute healthcare event (2013-2018)

	Schizophrenia		Bipolar Disorder		Major Depression		Anxiety disorders/ phobias		Post-traumatic stress disorder		Other psychotic disorders		Disruptive disorders		Co-morbid eating disorders		Co-morbid substance use disorders	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
<b>Established outpatient healthcare engagement</b>																		
Primary care and mental health care	3.45	2.69-4.41	3.13	2.86-3.42	2.77	2.65-2.90	2.47	1.92-3.19	4.19	2.52-6.96	2.34	1.88-2.92	3.66	2.23-6.03	2.07	1.28-3.34	2.17	1.91-2.46
Mental health care only	2.95	2.28-3.81	2.73	2.51-2.97	2.58	2.45-2.71	2.53	1.89-3.38	4.32	2.43-7.69	1.96	1.67-2.31	2.46	1.39-4.37	1.99	1.24-3.18	2.26	1.98-2.58
Primary care only	1.12	0.84-1.49	1.19	1.09-1.30	1.22	1.15-1.28	0.77	0.56-1.05	1.45	0.76-2.76	1.01	0.82-1.25	1.06	0.49-2.31	0.95	0.47-1.95	1.34	1.13-1.59
None	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference			
<b>Age, years</b>																		
12-13	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference			
14-15	1.32	0.58-3.02	0.82	0.73-0.93	1.03	0.94-1.14	0.98	0.73-1.32	1.40	0.83-2.36	1.11	0.74-1.66	0.96	0.70-1.33	0.75	0.40-1.39	0.98	0.41-2.37
16-17	0.95	0.48-1.87	0.78	0.69-0.88	0.95	0.88-1.03	0.77	0.60-1.00	1.29	0.72-2.31	1.00	0.68-1.47	0.63	0.43-0.91	0.85	0.46-1.57	0.68	0.28-1.64
18-19	1.07	0.56-2.03	0.79	0.70-0.90	0.77	0.70-0.85	0.74	0.52-1.07	1.10	0.60-2.01	0.87	0.62-1.22	0.78	0.42-1.44	0.51	0.28-0.94	0.59	0.24-1.47
20-21	0.99	0.51-1.92	0.78	0.69-0.88	0.72	0.64-0.81	0.76	0.53-1.08	1.08	0.59-1.96	0.75	0.54-1.06	0.67	0.28-1.62	0.29	0.14-0.60	0.48	0.20-1.15
22-23	0.97	0.52-1.81	0.81	0.69-0.95	0.74	0.65-0.83	0.57	0.38-0.86	0.82	0.39-1.72	0.63	0.43-0.90	1.24	0.60-2.58	0.64	0.33-1.24	0.48	0.20-1.16
24-25	0.96	0.50-1.83	0.76	0.67-0.86	0.73	0.67-0.80	0.46	0.33-0.63	0.66	0.35-1.23	0.63	0.45-0.89	0.79	0.21-2.91	0.37	0.21-0.65	0.49	0.20-1.19
26-27	0.94	0.51-1.72	0.86	0.74-1.00	0.88	0.78-1.00	0.64	0.35-1.16	2.73	1.25-5.95	0.89	0.60-1.31	8.52	0.83-87.82	0.81	0.34-1.90	0.54	0.21-1.39
<b>Female</b>	1.26	1.09-1.47	1.25	1.20-1.31	1.06	1.03-1.09	1.19	0.99-1.43	1.16	0.86-1.58	1.44	1.22-1.70	1.24	0.94-1.63	1.87	1.28-2.74	1.07	0.97-1.18
<b>Plan type</b>																		
Basic/ major medical/ comprehensive	0.76	0.53-1.10	0.95	0.68-1.32	0.79	0.60-1.04	1.14	0.62-2.10	1.41	0.67-2.97	0.81	0.55-1.20	0.44	0.18-1.11	0.66	0.27-1.60	0.89	0.64-1.25
Preferred provider organization	1.01	0.77-1.33	1.09	0.93-1.29	1.06	0.93-1.21	1.04	0.74-1.46	0.99	0.67-1.48	1.09	0.87-1.37	1.05	0.69-1.59	0.74	0.51-1.05	1.09	0.90-1.31
High-deductible/consumer-driven	1.17	0.87-1.59	1.15	1.00-1.31	1.03	0.89-1.19	1.03	0.73-1.45	0.89	0.54-1.46	1.11	0.87-1.42	1.03	0.64-1.67	0.96	0.62-1.47	1.21	0.93-1.58
All other health plans	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference			
<b>Pediatric medical complexity</b>																		
Non-chronic	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference			
Non-complex chronic	1.00	0.83-1.20	1.01	0.94-1.08	1.03	0.98-1.08	1.12	0.93-1.35	0.87	0.68-1.10	0.94	0.80-1.10	1.11	0.86-1.44	0.96	0.70-1.32	0.92	0.83-1.02
Complex chronic	0.97	0.84-1.13	1.02	0.94-1.10	1.05	0.99-1.12	0.80	0.64-1.01	0.97	0.60-1.57	0.90	0.72-1.11	0.95	0.61-1.48	1.05	0.75-1.47	0.83	0.74-0.92
<b>Length of stay, days</b>																		
3 or less	Reference		Reference		Reference		Reference		Reference		Reference		Reference		Reference			
4 to 6	1.13	0.92-1.40	1.13	1.05-1.23	1.22	1.17-1.28	1.48	1.18-1.86	1.22	0.81-1.84	1.46	1.17-1.81	1.52	1.07-2.15	0.57	0.31-1.05	1.16	1.05-1.29

7 to 10	1.21	0.92-1.59	1.20	1.11-1.30	1.26	1.19-1.33	1.88	1.46-2.43	1.39	0.89-2.19	1.69	1.26-2.26	1.18	0.74-1.89	0.52	0.33-0.81	1.23	1.08-1.40
11 or more	1.05	0.87-1.26	1.14	1.01-1.27	1.04	0.95-1.13	1.11	0.81-1.53	0.87	0.52-1.44	1.64	1.26-2.14	0.98	0.63-1.52	0.52	0.35-0.77	1.27	1.05-1.54
<b>Left against medical advice</b>	1.45	0.82-2.56	1.01	0.82-1.25	1.02	0.88-1.20	1.02	0.45-2.39	1.51	0.32-7.02	1.26	0.75-2.10	2.51	0.83-7.64	0.99	0.50-1.97	0.70	0.53-0.92
<b>Self-harm/ suicide-related event</b>	1.12	0.94-1.32	1.05	1.00-1.10	1.06	1.01-1.11	1.15	0.93-1.43	1.23	0.93-1.62	1.02	0.85-1.22	1.13	0.83-1.54	0.94	0.67-1.32	1.12	0.97-1.28

\*Stratified analysis for those with only a self-harm/suicide-related acute event (i.e., no co-morbid mental health diagnosis) was not conducted.

Table S13. Factors associated with mental health follow-up within 7 days of emergency room use for mental health, by primary diagnosis coded on acute healthcare event (2013-2018)

	Schizophrenia		Bipolar Disorder		Major Depression		Anxiety disorders/ phobias		Post-traumatic stress disorder		Other psychotic disorders		Disruptive disorders		Co-morbid substance use disorders	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
<b>Established outpatient healthcare engagement</b>																
Primary care and mental health care	4.10	2.39-7.02	5.01	4.19-5.98	3.49	3.14-3.89	4.23	3.89-4.60	9.77	5.48-17.45	3.90	3.07-4.96	4.87	3.56-6.68	4.87	4.16-5.71
Mental health care only	4.69	2.92-7.52	4.39	3.75-5.15	2.95	2.61-3.33	3.52	3.21-3.84	4.97	2.69-9.19	3.82	2.86-5.09	4.45	3.00-6.61	4.40	3.64-5.33
Primary care only	1.05	0.56-1.97	1.43	1.13-1.79	1.23	1.13-1.33	1.22	1.15-1.30	2.51	1.23-5.12	1.19	0.89-1.58	1.14	0.87-1.50	1.15	0.98-1.36
None	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
<b>Age, years</b>																
12-13	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
14-15	3.55	0.46-27.32	1.02	0.82-1.26	1.04	0.95-1.14	0.89	0.80-1.00	1.14	0.62-2.12	0.79	0.54-1.16	0.90	0.73-1.10	0.89	0.51-1.53
16-17	3.04	0.41-22.36	0.90	0.76-1.06	0.98	0.90-1.08	0.84	0.76-0.93	0.74	0.42-1.31	0.69	0.53-0.90	0.74	0.61-0.90	0.58	0.35-0.96
18-19	2.68	0.44-16.48	0.76	0.60-0.96	0.68	0.60-0.78	0.62	0.55-0.70	0.95	0.48-1.89	0.62	0.42-0.92	0.64	0.45-0.91	0.33	0.20-0.53
20-21	2.62	0.35-19.93	0.81	0.64-1.03	0.66	0.59-0.75	0.64	0.57-0.72	0.74	0.38-1.45	0.57	0.39-0.85	0.73	0.52-1.03	0.34	0.20-0.59
22-23	3.22	0.45-23.27	0.75	0.61-0.92	0.62	0.56-0.70	0.65	0.58-0.73	0.31	0.11-0.83	0.46	0.30-0.69	0.74	0.52-1.05	0.30	0.17-0.51
24-25	2.56	0.35-18.96	0.77	0.61-0.96	0.71	0.62-0.83	0.67	0.59-0.77	0.65	0.31-1.36	0.45	0.32-0.62	0.58	0.37-0.90	0.36	0.22-0.60
26-27	2.49	0.33-18.83	1.00	0.77-1.29	0.80	0.68-0.94	0.75	0.65-0.88	0.70	0.33-1.50	0.48	0.31-0.75	0.30	0.12-0.73	0.33	0.18-0.60
<b>Female</b>	1.21	0.92-1.60	1.08	0.94-1.23	1.06	1.01-1.12	0.94	0.90-0.97	1.68	1.04-2.71	0.95	0.80-1.12	0.88	0.73-1.06	1.11	1.01-1.22
<b>Plan type</b>																
Basic/ major medical/ comprehensive	0.76	0.30-1.94	0.99	0.59-1.65	1.07	0.84-1.36	0.84	0.71-0.99	1.97	0.31-12.64	2.11	1.19-3.71	0.76	0.40-1.42	1.06	0.66-1.70
Preferred provider organization	1.32	0.94-1.85	1.02	0.88-1.19	1.12	0.94-1.33	1.04	0.94-1.14	1.34	0.86-2.10	1.38	1.01-1.87	1.03	0.85-1.24	1.01	0.84-1.20
High-deductible/consumer- driven	1.06	0.67-1.69	0.91	0.77-1.08	1.07	0.94-1.23	1.03	0.95-1.12	1.67	0.81-3.45	1.14	0.78-1.67	1.07	0.84-1.37	1.12	0.95-1.34
All other health plans	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
<b>Pediatric medical complexity</b>																
Non-chronic	Reference		Reference		Reference		Reference		Reference		Reference		Reference			
Non-complex chronic	0.89	0.66-1.21	0.95	0.86-1.04	1.11	1.04-1.19	0.92	0.88-0.97	1.04	0.65-1.66	0.87	0.70-1.08	0.99	0.83-1.19	1.24	1.12-1.38
Complex chronic	0.91	0.69-1.19	0.94	0.82-1.09	1.08	0.98-1.19	0.91	0.85-0.97	0.61	0.36-1.02	0.93	0.74-1.17	1.12	0.88-1.44	0.91	0.78-1.06
<b>Self-harm/ suicide-related event</b>	0.97	0.54-1.74	1.06	0.93-1.20	1.08	1.00-1.18	1.54	1.40-1.69	1.02	0.71-1.47	0.90	0.57-1.40	1.21	0.97-1.49	1.39	1.18-1.63

\*Analysis for those with co-morbid eating disorders not shown because sample size did not permit stratified analyses. Stratified analysis for those with only a self-harm/suicide-related acute event (i.e., no co-morbid mental health diagnosis) was not conducted.

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