



Epi Data Brief

New York City Department of Health and Mental Hygiene

June 2016, No. 70

Psychiatric Hospitalizations among Children and Adolescents in New York City

Psychiatric hospitalization rates provide important information about utilization patterns. Although criteria for psychiatric admission and diagnoses standards may vary across populations, patterns of utilization offer insight into population needs, including need for community-based mental health services. Such information is useful for planning purposes.

In New York City (NYC), 11% of all hospitalizations among children and adolescents in 2013 were for a psychiatric condition, compared with 10% reported nationally.¹ This data brief describes psychiatric hospitalization among children and adolescents in NYC as well as the characteristics of these who were hospitalized.

Definitions:

Psychiatric hospitalization: Hospitalization for a mental disorder as identified by ICD-9 code (primary diagnosis at hospital discharge).

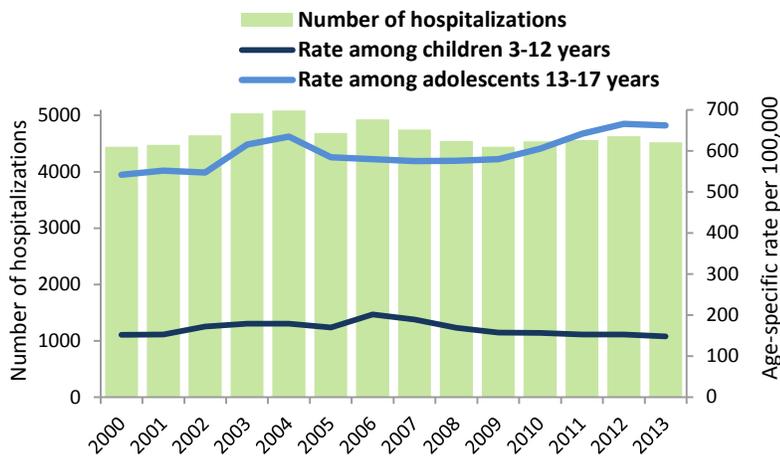
Children: Ages 3-12

Adolescents: Ages 13-17

Neighborhood poverty: Defined by the percent of residents in each ZIP code with incomes below 100% of the federal poverty level (American Community Survey 2009-2013), separated into four groups: low (<10%), medium (10%-<20%), high (20%-<30%), and very high (>30%) neighborhood poverty.

Rate of psychiatric hospitalizations among children and adolescents, 2000-2013

Psychiatric hospitalizations among children and adolescents, New York City, 2000 to 2013



Source: Statewide Planning and Research Collaborative System, 2000-2013

- During 2000 to 2013, there was an average of 1,664 psychiatric hospitalizations annually among children, and an average of 3,001 among adolescents in NYC.
- Psychiatric hospitalization rates among adolescents were three to four times higher than among children.
- Among children, rates increased from 152 to 201 per 100,000 from 2000 to 2006, while rates from 2007 to 2013 decreased to a low of 148 per 100,000 in 2013.
- Among adolescents, rates showed an increasing trend, ranging from a low of 542 per 100,000 in 2000 to a peak of 666 per 100,000 in 2012.

Data sources:

Statewide Planning and Research Collaborative System (SPARCS) 2000-2013: SPARCS is an administrative database of all hospital discharges reported by New York State (NYS) hospitals to the NYS Department of Health. Diagnoses are coded according to the International Statistical Classification of Diseases and Related Health Problems-9th Revision framework. All data presented in this report are limited to NYC residents ages 3 to 17 years old who had a hospitalization for a psychiatric condition (ICD-9 codes 290-316).

NYC DOHMH population estimates 2000-2013, modified from US Census Bureau interpolated intercensal population estimates, updated August 8, 2014.

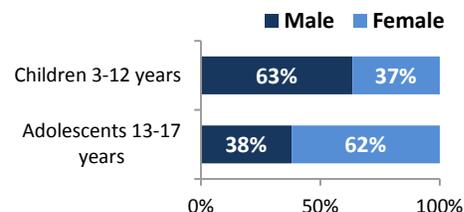
Salient NYS Medicaid System: Salient is an interactive data mining software tool used to access de-identified Medicaid claims data. This analysis includes payment cycles through 2,002; access date January 15, 2016.

¹City-wide rate of Medicaid enrollment among ages 0 to 17: 1,263,138 enrolled in Medicaid [Salient] / 1,784,583 [2013 intercensal population estimate].

Characteristics of children and adolescents experiencing psychiatric hospitalization in 2013

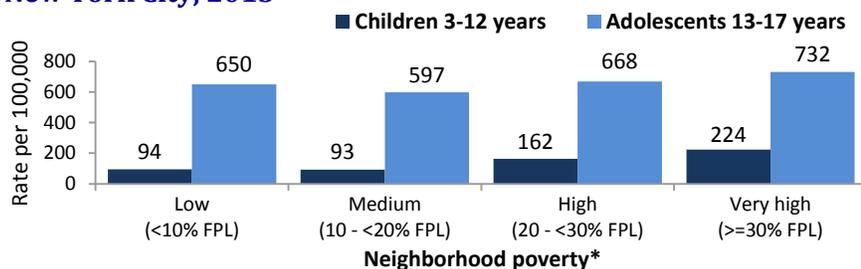
- In NYC the majority of children who experienced psychiatric hospitalization in 2013 were male (63%), while the majority of adolescents were female (62%).
- In 2013, 71% of New Yorkers younger than 18 were enrolled in Medicaid for all or part of the year.[^] Among children and adolescents who experienced a psychiatric hospitalization, 71% reported public insurance, such as Medicaid, 26% reported private insurance, and 3% were either uninsured or had some other insurance type.
- Children were more likely than adolescents to have public rather than private insurance: 77% of children had public insurance compared with 68% of adolescents.

Children and adolescents with psychiatric hospitalization by sex, New York City, 2013



Source: Statewide Planning and Research Collaborative System, 2013

Rate of psychiatric hospitalization by neighborhood poverty,* New York City, 2013



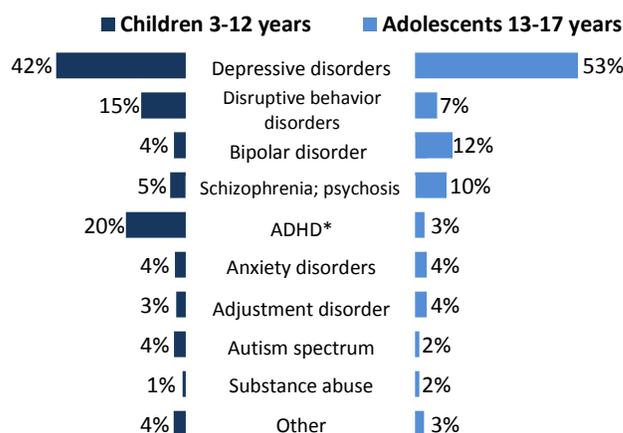
*Neighborhood poverty (based on ZIP code) defined as the percent of residents in each ZIP code with incomes below 100% of the Federal Poverty Level (FPL), per American Community Survey 2009-2013
Source: Statewide Planning and Research Collaborative System, 2013

- Children in NYC living in very high poverty neighborhoods were more than twice as likely to be hospitalized as children living in low poverty neighborhoods (224 vs. 94 per 100,000).
- Rates for adolescents ranged from 597 per 100,000 for those living in medium poverty neighborhoods, to 732 per 100,000 for those living in very high poverty neighborhoods.

Clinical characteristics of psychiatric hospitalizations differed between children and adolescents in 2013

- In 2013, the average length of stay for a psychiatric hospitalization among children and adolescents in NYC was more than three times longer than for a non-psychiatric hospitalization (12.3 vs. 3.7 days).
- Depressive disorders, including major depression and mood disorder not-otherwise-specified, were the most common primary diagnostic grouping for psychiatric hospitalization, representing 42% and 53% of children and adolescent hospitalizations, respectively.
- Among children, the second most common primary diagnoses was attention-deficit/hyperactivity disorder (ADHD) (20%) followed by disruptive behavior disorders (15%), which include conduct disorder and oppositional defiant disorder.
- Among adolescents, bipolar disorder (12%) and schizophrenia and other psychotic disorders (10%) were the second and third most common primary diagnoses.
- Co-occurring psychiatric diagnoses occurred in 70% of all psychiatric hospitalizations.
- Twenty percent of children and adolescents hospitalized in 2013 had experienced a prior psychiatric hospitalization discharge during the preceding 12 months.

Diagnostic groupings of hospitalizations, New York City, 2013



*Attention-deficit/hyperactivity disorder
Source: Statewide Planning and Research Collaborative System, 2013

Comment: Data have shown that Black and Hispanic children and adolescents have a higher diagnosed prevalence of mental health problems relative to White children and adolescents.^{2,3} Data describing the demographic characteristics of psychiatric hospitalization among children and adolescents are sparse, although rates of emergency department visits among Black children and adolescents have been found to be greater relative to White children and adolescents.⁴ Consideration of race, in addition to poverty, is important for understanding population patterns. We were unable to examine race because in New York City, race/ethnicity data collected in hospitalization records (SPARCS) have been found to lack reliability.** Therefore we are not able to report these data in this analysis. The New York State Department of Health is taking steps to improve the quality of race/ethnicity data collection. In addition, the New York City Department of Health and Mental Hygiene is developing a methodology to impute race/ethnicity. We hope to report further analysis in future publications.

**The New York State Department of Health identified patient's race and ethnicity in both 2012 SPARCS records and Medicaid enrollment forms. Concordance rates varied significantly across hospitals: among 22 of 62 New York City hospitals, less than 50% of matched patients' race was consistent in both data sets. (http://www.health.ny.gov/statistics/sparcs/reports/race_eth/).

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References:

¹Bardach N, Coker T, Zima B et al. Common and Costly Hospitalizations for Pediatric Mental Health Disorders. *Pediatrics*. 2014; 133(4): 602-609.

²Mills C, McVeigh KH. Prevalence of Emotional and Behavioral Problems among Children in New York City and Association with Household Poverty. Presentation, 143rd American Public Health Association Annual Meeting & Exposition, Chicago, IL. 2015.

³Merikangas K, He J, Burstein M et al. Lifetime Prevalence of Mental Disorders in US Adolescents: Results from the National Comorbidity Study-Adolescent Supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry*. 2010; 49(10):980-989.

⁴Simon A, Schoendorf K. Emergency Department Visits for Mental Health Conditions among US Children, 2001-2011. *Clin Pediatr (Phila)*. 2014; 53(14):1359-1366.

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Epi Data Tables

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Data Tables

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- Table 2.** Characteristics of children and adolescents with psychiatric hospitalization, overall and by age group, New York City, 2013
- Table 3.** Rate of psychiatric hospitalization by neighborhood poverty level by age group, New York City, 2013
- Table 4.** Clinical characteristics of psychiatric hospitalizations among children and adolescents, overall and by age group, New York City, 2013

Data Sources

Statewide Planning and Research Collaborative System (SPARCS) 2000-2013: SPARCS is an administrative database of all hospital discharges reported by New York State (NYS) hospitals to the NYS Department of Health.

Diagnoses are coded according to the International Statistical Classification of Diseases and Related Health Problems-9th Revision framework. All data presented in this report are limited to NYC residents ages 3 to 17 years old who had a hospitalization for a psychiatric condition (ICD-9 codes 290-316).

NYC DOHMH population estimates 2000-2013, modified from US Census Bureau interpolated intercensal population estimates, updated August 8, 2014.

Table 1. Number and rate¹ of psychiatric hospitalizations among children and adolescents by age group, New York City, 2000-2013

Source: Statewide Planning and Research Collaborative System, 2000-2013; Rates calculated using NYC Health Department population estimates, modified from US Census Bureau intercensal population estimates, 2010-2013. Updated August 2014.

Year	Children, 3-12 years		Adolescents, 13-17 years	
	Rate (n)	Joinpoint trends ²	Rate (n)	Joinpoint trends ²
2000	151.8 (1672)	2000-2006 APC ³ = 3.54	541.7 (2773)	2000-2013 APC ³ = 1.21
2001	153.0 (1659)		551.4 (2820)	
2002	172.3 (1840)		547.5 (2808)	
2003	179.1 (1871)		615.6 (3167)	
2004	178.9 (1820)		634.8 (3267)	
2005	169.7 (1678)		584.1 (3009)	
2006	201.4 (1950)	579.8 (2980)		
2007	188.9 (1803)	575.3 (2943)		
2008	169.3 (1611)	576.2 (2937)		
2009	157.6 (1506)	579.5 (2937)		
2010	156.5 (1499)	2007-2013 APC ³ = -3.92	605.0 (3041)	
2011	152.9 (1466)		641.4 (3097)	
2012	153.0 (1478)		665.6 (3151)	
2013	148.2 (1440)		661.7 (3085)	

1. Age-specific rates per 100,000 New Yorkers.

2. Joinpoint regression identifies time periods with distinct rate trends.

3. The annual percent change (APC) is significantly different from zero ($p < 0.05$).

Table 2. Characteristics of children and adolescents with psychiatric hospitalization, overall and by age group, New York City, 2013

Source: Statewide Planning and Research Collaborative System, 2013

	Overall		Children (3-12 years)		Adolescents (13-17 years)		P-value ¹
	Number	Percent	Number	Percent	Number	Percent	
Total individuals hospitalized	3,766	100.0	1,182	100.0	2,584	100.0	
Sex							
Male	1,732	46.0	750	63.5	982	38.0	<.0001
Female	2,034	54.0	432	36.5	1,602	62.0	<.0001
Insurance type²							
Public	2,677	71.1	911	77.1	1,766	68.3	<.0001
Private	975	25.9	242	20.5	733	28.4	<.0001
Other	114	3.0	29	2.5	85	3.3	0.1647
Neighborhood poverty³							
Low	489	13.0	110	9.3	379	14.7	<.0001
Medium	876	23.3	212	18.0	664	25.7	<.0001
High	1,202	32.0	398	33.7	804	31.2	0.1196
Very high	1,195	31.8	462	39.0	734	28.4	<.0001

1. Chi-square p-value represents within group differences between children and adolescents. A p-value is a measure of statistical significance. A bold P-value, less than .05, signifies a significant difference between groups.

2. Insurance type defined by expected payee of claim. Public insurance includes Medicaid and other government insurance; private includes commercial and employer-offered insurance; and, other insurance includes uninsured and additional unique insurance situations.

3. Neighborhood poverty (based on zip code) was defined as the percentage of residents with incomes below 100% of the Federal Poverty Level, per American Community Survey 2009-2013, separated into four groups: low (<10%), medium (10 %-< 20%), high (20 %-< 30%), and very high (>=30%). Responses in this group will not equal the overall total due to missing zip codes for some hospitalization records.

Table 3. Rate of psychiatric hospitalization by neighborhood poverty level by age group, New York City, 2013

Source: Statewide Planning and Research Collaborative System, 2013; US Census Bureau

All hospitalizations	Children (3-12 years) Rate (n)	Adolescents (13-17 years) Rate (n)
Total	148.2 (1440)	661.7 (3085)
Neighborhood poverty¹		
Low	93.7 (140)	650.0 (452)
Medium	93.0 (255)	597.0 (798)
High	162.3 (482)	667.6 (962)
Very high	224.0 (562)	731.5 (870)

1. Neighborhood poverty (based on zip code) was defined as the percentage of residents with incomes below 100% of the Federal Poverty Level, per American Community Survey 2009-2013, separated into four groups: low (<10%), medium (10 %-< 20%), high (20 %-< 30%), and very high (>=30%). Responses in this group will not equal the overall total due to missing zip codes for some hospitalization records.

Table 4. Clinical characteristics of psychiatric hospitalizations among children and adolescents, overall and by age group, New York City, 2013

Source: Statewide Planning and Research Collaborative System, 2013

	Overall		Children (3-12 y)		Adolescents (13-17 y)		P-value ¹
	Number	Percent	Number	Percent	Number	Percent	
Total hospitalizations	4,525	100.0	1,440	100.0	3,085	100.0	
Average length of stay (median)	12.3 days	(8)	12.5 days	(9)	12.2 days	(8)	0.63
Primary diagnosis²							
Depressive disorders	2,254	49.1	611	42.4	1,643	53.3	<.0001
Disruptive behavior disorders	435	9.6	210	14.6	225	7.3	<.0001
Bipolar disorder	432	9.6	54	3.8	378	12.3	<.0001
Schizophrenia; psychotic disorder	393	8.7	74	5.1	319	10.3	<.0001
Attention-deficit/hyperactivity disorder (ADHD)	379	8.4	282	19.6	97	3.1	<.0001
Anxiety disorders	169	3.7	50	3.5	119	3.9	0.5245
Adjustment disorder	166	3.7	45	3.1	121	3.9	0.1839
Autistic spectrum	100	2.2	55	3.8	45	1.5	<.0001
Substance abuse	50	1.1	3	0.2	47	1.5	<.0001
Other	147	3.3	56	3.9	91	3.0	0.097
>1 psychiatric diagnosis at hospitalization	3,183	70.3	1,128	78.3	2,055	66.6	<.0001

1. T-test and chi-square p-value represents within group differences between children and adolescents. A p-value is a measure of statistical significance. A bold P-value, less than .05, signifies a significant difference between groups.

2. Diagnosis was determined based on ICD-9 code of primary diagnosis at discharge and categorized as follows: depressive disorders includes 296.2, 296.3, 296.9 and 311; disruptive behavior disorders includes 312, 313.0-313.7 and 313.80-313.82; bipolar disorder includes 296.0, 296.1 and 296.4-296.8; schizophrenia and psychotic disorders includes 290-295, 297 and 298; ADHD includes 314; anxiety disorders includes 300.0-300.3, 300.5-300.9, 308, 309.21 and 309.81; adjustment disorder includes 309.0-309.1, 309.20, 309.22-309.309.29, 309.3-309.7, 309.80, 309.82-309.89 and 309.9; autism spectrum included 299; substance abuse includes 303-305; and other includes all remaining diagnoses with codes between 290-316.