

Lifetime Prevalence of Mental Disorders in U.S. Adolescents: Results from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A)

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Objective: To present estimates of the lifetime prevalence of *DSM-IV* mental disorders with and without severe impairment, their comorbidity across broad classes of disorder, and their sociodemographic correlates. **Method:** The National Comorbidity Survey–Adolescent Supplement NCS-A is a nationally representative face-to-face survey of 10,123 adolescents aged 13 to 18 years in the continental United States. *DSM-IV* mental disorders were assessed using a modified version of the fully structured World Health Organization Composite International Diagnostic Interview. **Results:** Anxiety disorders were the most common condition (31.9%), followed by behavior disorders (19.1%), mood disorders (14.3%), and substance use disorders (11.4%), with approximately 40% of participants with one class of disorder also meeting criteria for another class of lifetime disorder. The overall prevalence of disorders with severe impairment and/or distress was 22.2% (11.2% with mood disorders, 8.3% with anxiety disorders, and 9.6% behavior disorders). The median age of onset for disorder classes was earliest for anxiety (6 years), followed by 11 years for behavior, 13 years for mood, and 15 years for substance use disorders. **Conclusions:** These findings provide the first prevalence data on a broad range of mental disorders in a nationally representative sample of U.S. adolescents. Approximately one in every four to five youth in the U.S. meets criteria for a mental disorder with severe impairment across their lifetime. The likelihood that common mental disorders in adults first emerge in childhood and adolescence highlights the need for a transition from the common focus on treatment of U.S. youth to that of prevention and early intervention. *J. Am. Acad. Child Adolesc. Psychiatry*, 2010;49(10):980–989. **Key Words:** epidemiology, adolescents, mental disorders, National Comorbidity Survey, correlates

There has been tremendous growth in the field of child psychiatric epidemiology over the past two decades.¹ The results of numerous community surveys in specific regions of the United States^{2–8} have shown that about one in every three to four children experiences a mental disorder and that about one in 10 children has a serious emotional disturbance,^{9–11} with few affected youth receiving adequate mental health care. However, there has been a lack of empirical data on the prevalence and distribution of a wide range of *DSM-IV* mental disorders from a nationally representative sample of children or adolescents. Such information is necessary to establish resource allocation priorities for prevention, treatment, and research.

Based on recommendations of the landmark Surgeon General's Report on Mental Health¹² and a subgroup of the National Institute of Mental Health (NIMH) National Advisory Mental Health Council,¹³ the NIMH established several research initiatives to address the lack of national statistics on mental health in children. Instruments for assessing mental health were added to two large national surveys including the Strengths and Difficulties Questionnaire (SDQ) to the National Health Interview Survey,¹⁴ and selected modules from the National Institute of Mental Health Diagnostic Interview Schedule for Children (DISC) Version 4¹⁵ to the National Health and Nutrition Examination Survey.¹¹ In addition

to these measures, the National Comorbidity Survey Replication (NCS-R)¹⁶ was extended to assess a broad range of *DSM-IV* disorders in a nationally representative sample of youth aged 13 to 18 years, referred to as the National Comorbidity Survey–Adolescent Supplement (NCS-A).¹⁷⁻²⁰

The goals of the present report are: (1) to present the lifetime prevalence estimates of mental disorders and the proportion of disorders that are associated with severe impairment in a nationally representative sample of U.S. adolescents; (2) to examine the magnitude of overlap in the major classes of mental disorders; and (3) to describe the individual and familial sociodemographic correlates of these disorders.

METHOD

Sample and Procedure

The NCS-A is a nationally representative, face-to-face survey of 10,123 adolescents aged 13 to 18 years in the continental United States.¹⁷ The survey was administered by the professional interview staff of the Institute for Social Research at the University of Michigan. The NCS-A was carried out in a dual-frame sample that included a household subsample and a school subsample.^{18,20,21} The overall NCS-A adolescent response rate combining the two subsamples was 82.9%. Comparisons of sample and population distributions on census sociodemographic variables and the school sample on school characteristics revealed only minor differences that were corrected with poststratification weighting.

One parent or parent surrogate of each participating adolescent was asked to complete a self-administered questionnaire (SAQ) that contained informant questions about the adolescent's mental health. The full SAQ was completed by 6,491 parents. These recruitment and consent procedures were approved by the Human Subjects Committees of both Harvard Medical School and the University of Michigan. Once the survey was completed, cases were weighted for variation in within-household probability of selection (in the household subsample) and for residual discrepancies between the sample and the U.S. population on the basis of socio-demographic and geographic variables. These weighting procedures are discussed in more detail elsewhere.^{18,20} Socio-demographic variables assessed in the NCS-A include age (in years), sex, race/ethnicity, parent education, urbanicity, and marital status of parents. A poverty index ratio, based on family size and the ratio of family income to the family's poverty threshold level (≤ 1.5 [poor], ≤ 3 , ≤ 6 , and > 6), was also included.

Table 1 presents the weighted socio-demographic characteristics of the study sample. Approximately half of the sample was male (51.3%). The mean age was 15.2

years, with a larger proportion of youth aged 13 to 14 years (36.2%), and approximately equal distributions of youth aged 15 (20.5%), 16 (21.0%), and 17 to 18 (22.3%) years. The sample was comprised 65.6% non-Hispanic white, 15.1% non-Hispanic blacks, and 14.4% Hispanic individuals. In terms of family characteristics, 84.5% of the sample had parents who had completed at least high school; 14.7% had a poverty index ratio at 1.5 or less; nearly half of the sample resided in a metropolitan area; and 78.6% had parents who were married or cohabiting.

Measures

Diagnostic Assessment. Details of the diagnostic and risk factor measures are described by Merikangas et al.¹⁷ Briefly, a modified version of the World Health Organization (WHO) Composite International Diagnostic Interview Version 3.0 (CIDI), a fully structured interview administered by trained lay interviewers to generate *DSM-IV* diagnoses¹⁶ was administered to adolescents. Modifications to the CIDI involved enhancing the wording and appropriateness of the instrument for assessment of adolescents. Lifetime disorders assessed in the CIDI included mood disorders and episodes (major depressive disorder [MDD] or dysthymic disorder, bipolar I or II [BPD]), anxiety disorders (panic disorder, agoraphobia, social phobia, specific phobia, generalized anxiety disorder [GAD]), posttraumatic stress disorder [PTSD], separation anxiety disorder [SAD]), behavior disorders (attention-deficit/hyperactivity disorder [ADHD]), oppositional defiant disorder [ODD], and conduct disorder [CD]), substance use disorders (alcohol abuse/dependence, drug abuse/dependence), and eating disorders (anorexia nervosa, bulimia nervosa, and binge eating disorder). Parents (or parent surrogates) were mailed a self-administered questionnaire (SAQ) to collect additional information on adolescent sociodemographic characteristics, developmental background, mental and physical health, and other family- and community-level factors. Parents who completed the SAQ provided full *DSM-IV* diagnostic information about MDD and dysthymic disorder, SAD, ADHD, ODD, and CD, whereas those completing the abbreviated SAQ reported only on ADHD. Based on prior research that has documented the value of supplemental parent reports,^{22,23} information from both the parent and adolescent were combined for major depression and behavior problems and classified as positive if either informant endorsed the diagnostic criteria. Definitions of all psychiatric disorders adhered to *DSM-IV* criteria and diagnostic hierarchy rules were applied for every disorder, with the exception of oppositional defiant disorder and substance use disorders. Psychiatric disorders derived from the modified CIDI showed good concordance with a clinical reappraisal subsample.¹⁹

Impairment criteria embedded in *DSM-IV* required endorsement of some/a lot/extreme levels of impairment or moderate/severe/very severe levels of symp-

TABLE 1 Sociodemographic Characteristics of the National Comorbidity Survey–Adolescent Supplement (NCS-A) (N = 10,123)

Sociodemographic characteristics	Category	N	Weighted %
Sex	Male	4,953	51.3
	Female	5,170	48.7
Age ^a	13-14	3,870	36.2
	15	1,887	20.5
	16	2,010	21.0
	17-18	2,356	22.3
Race	Non-Hispanic white	5,634	65.6
	Non-Hispanic black	1,953	15.1
	Hispanic	1,914	14.4
	Other	622	5.0
Parental education	Less than high school	1,684	15.5
	High school	3,081	29.7
	Some college	1,998	19.4
	College graduate	3,360	35.3
Parental marital status ^b	Married/cohabiting	4,602	78.6
	Previous married	1,009	17.5
	Never married	308	3.9
Poverty index ratio	≤1.5	1,717	14.7
	≤3.0	2,023	19.1
	≤6.0	3,101	31.9
	>6	3,282	34.3
Urbanicity	Metro	4,508	47.5
	Other urban	3,304	37.6
	Rural	2,311	14.9

Note: ^aWeighted mean (SE) age = 15.2 (0.1).
^bOther/unknown marital status are not presented.

tom severity. To more clearly identify disorders that were clinically significant, our definition of severe lifetime disorders used higher thresholds of impairment that required endorsement of “a lot” or “extreme” impairment in daily activities, or “severe or very severe” distress. Severe emotional disorders required both distress and impairment to be present, and severe behavior disorders (ADHD, ODD, and CD) required endorsement of symptom criteria by both the parent and the adolescent.

Statistical Analysis

All statistical analyses were completed with the SUDAAN software package and use the Taylor series linearization method to take into account the complex survey design. Cross-tabulations were used to calculate prevalence and comorbidity. Logistic regression analysis was used to examine demographic correlates of prevalence; regression models included all sociodemographic variables simultaneously, and adjusted odds ratios are presented. Age-of-onset curves were generated using the Kaplan-Meier survival analysis method. Multivariate significance tests were calculated using Wald Chi-square tests based on coefficient

variance–covariance matrices that were adjusted for design effects using the Taylor series method. Statistical significance was based on two-sided design-based tests evaluated at a level of significance of 0.05.

RESULTS

Lifetime Prevalence

Table 2 presents the lifetime prevalence rates of DSM-IV mental disorders by sex, age group, total DSM-IV disorders, and disorders with severe impairment. Mood disorders affected 14.3% of the total sample, corresponding to 11.7% who met criteria for MDD or dysthymia and 2.9% for BPD. Females were twice as likely as males to experience unipolar mood disorders, and somewhat more likely to experience BPD. The prevalence of all mood disorders increased uniformly with age, with a nearly twofold increase from the 13- to 14-year age group to the 17- to 18-year age group. Severe cases of mood disorder (11.2% of the total sample) represented 74.4% of all MDD or dysthymic disorders, and 89.7% of all cases of BPD. The sex-specific

TABLE 2 Lifetime Prevalence of DSM-IV Disorders by Sex and Age Group and Severe Impairment in the National Comorbidity Survey–Adolescent Supplement (NCS-A)

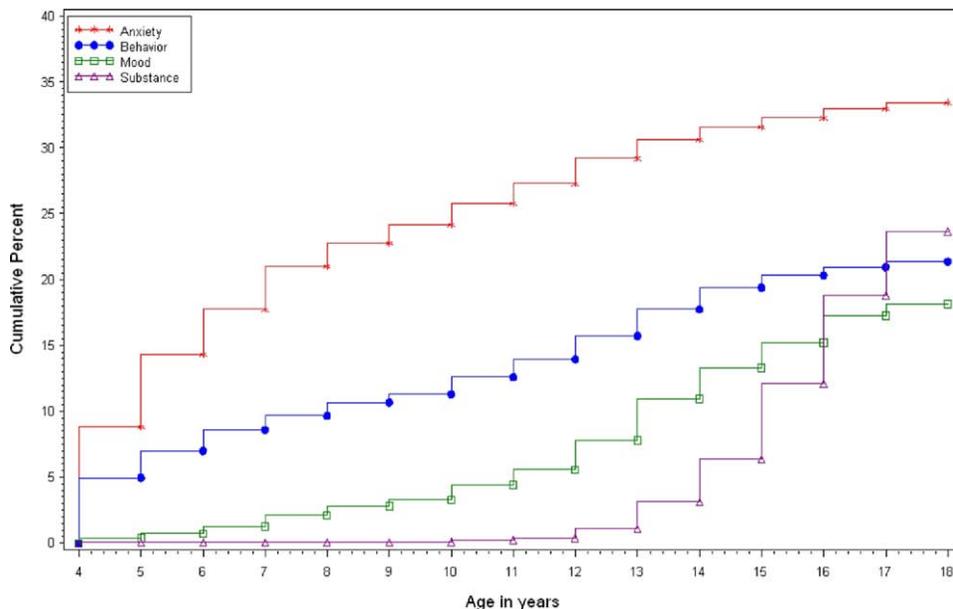
DSM-IV Disorder	DSM-IV Disorder													
	Sex				Age						Total		Adolescents with Severe Impairment	
	Female		Male		13-14 y		15-16 y		17-18 y		%	SE	%	SE
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Mood disorders														
Major depressive disorder or dysthymia	15.9	1.3	7.7	0.8	8.4	1.3	12.6	1.3	15.4	1.4	11.7	0.9	8.7	0.8
Bipolar I or II	3.3	0.4	2.6	0.3	1.9	0.3	3.1	0.3	4.3	0.7	2.9	0.3	2.6	0.2
Any mood disorder	18.3	1.4	10.5	1.1	10.5	1.3	15.5	1.4	18.1	1.6	14.3	1.0	11.2	1.0
Anxiety disorders														
Agoraphobia	3.4	0.4	1.4	0.3	2.5	0.4	2.5	0.4	2.0	0.5	2.4	0.2	—	—
Generalized anxiety disorder	3.0	0.6	1.5	0.3	1.0	0.3	2.8	0.6	3.0	0.5	2.2	0.3	0.9	0.2
Social phobia	11.2	0.7	7.0	0.5	7.7	0.6	9.7	0.7	10.1	1.0	9.1	0.4	1.3	0.2
Specific phobia	22.1	1.1	16.7	0.9	21.6	1.6	18.3	1.0	17.7	1.3	19.3	0.8	0.6	0.1
Panic disorder	2.6	0.3	2.0	0.3	1.8	0.4	2.3	0.3	3.3	0.7	2.3	0.2	—	—
Post-traumatic stress disorder	8.0	0.7	2.3	0.4	3.7	0.5	5.1	0.5	7.0	0.8	5.0	0.3	1.5	0.2
Separation anxiety disorder	9.0	0.6	6.3	0.5	7.8	0.6	8.0	0.7	6.7	0.8	7.6	0.3	0.6	0.1
Any anxiety disorder	38.0	1.4	26.1	0.8	31.4	1.9	32.1	1.0	32.3	1.7	31.9	0.8	8.3	0.4
Behavior disorders														
Attention deficit hyperactivity disorder	4.2	0.5	13.0	1.0	8.8	0.9	8.6	0.8	9.0	1.1	8.7	0.6	4.2	0.4
Oppositional defiant disorder	11.3	0.9	13.9	1.2	12.0	1.2	12.6	1.3	13.6	1.4	12.6	0.9	6.5	0.7
Conduct disorder	5.8	1.1	7.9	1.2	4.4	1.2	7.5	1.2	9.6	1.3	6.8	0.9	2.2	0.4
Any behavior disorder	15.5	1.2	23.5	1.6	18.2	1.5	19.5	1.7	21.9	1.8	19.6	1.2	9.6	0.8
Substance use disorders														
Alcohol abuse/dependence	5.8	0.5	7.0	0.6	1.3	0.3	6.5	0.6	14.5	1.2	6.4	0.4	—	—
Drug abuse/dependence	8.0	0.8	9.8	0.8	3.4	0.6	9.7	0.9	16.3	1.5	8.9	0.7	—	—
Any substance use disorder	10.2	0.9	12.5	0.8	3.7	0.6	12.2	0.9	22.3	1.6	11.4	0.7	—	—
Other														
Eating disorders	3.8	0.4	1.5	0.3	2.4	0.4	2.8	0.3	3.0	0.4	2.7	0.2	—	—
Any class ^a	51.0	1.4	48.1	1.6	45.3	2.1	49.3	1.9	56.7	2.7	49.5	1.2	22.2 ^b	1.0
1 class	30.3	1.3	30.3	1.3	31.2	1.8	29.4	1.4	30.4	2.3	30.3	0.9	16.2	0.6
2 classes	12.6	0.9	12.1	1.2	9.2	1.0	13.0	1.3	16.5	1.7	12.4	0.9	5.2	0.7
3 or 4 classes	8.1	1.1	5.7	0.6	5.0	1.1	6.9	0.9	9.9	1.3	6.9	0.7	0.8	0.2

Note: ^aExcludes eating disorders.
^bExcluding substance use disorders [with substance use disorders: any class = 27.6 (1.0); 1 class = 18.1 (0.7); 2 classes = 6.7 (0.5); 3 or 4 classes = 2.9 (0.6)].

rates for severe disorders (not presented in the table) maintained the same general patterns as were observed for the overall prevalence rates.

Nearly one in three adolescents (31.9%) met criteria for an anxiety disorder, with rates for individual disorders ranging from 2.2% for GAD to 19.3% for specific phobia. All anxiety disorder subtypes were more frequent in females (the greatest sex difference being observed for PTSD). The aggregate category of any anxiety disorder was stable across age groups, but considerable variance was observed by disorder subtype. In

particular, the prevalence of PTSD, panic disorder, social phobia, and GAD showed modest but consistent increases with age. Severe anxiety disorders were present in 8.3% of the total sample, representing all individuals with panic disorder or agoraphobia, a moderate proportion of individuals with GAD (54.5%) or PTSD (30%), and only a small proportion of individuals with social phobia (14.3%), SAD (7.9%), and specific phobia (3.1%), yielding prevalence rates of 1.3% for social phobia and 0.6% for SAD and specific phobia, respectively.

FIGURE 1 Cumulative lifetime prevalence of major classes of *DSM-IV* disorders among adolescents (N = 10,123).

The prevalence of ADHD was 8.7%, with three times as many males being affected by this condition as females. The prevalence of severe ADHD was 4.2%, or approximately half of all cases in the sample. ODD was present in 12.6% of the sample (6.5% for severe cases), and 6.8% met criteria for CD (2.2% for severe cases). Although the rates of ADHD and ODD remained relatively stable by age group, rates of CD increased to a peak of 9.6% among the oldest adolescents.

Substance use disorders were present in 11.4% of the sample, corresponding to 8.9% of adolescents with drug abuse/dependence and 6.4% with alcohol abuse/dependence. These disorders were somewhat more frequent in males, and a five- to 11-fold increase in prevalence was observed across increasing age groups. The rates for severe substance use disorders were identical to those of the *DSM-IV* disorders because impairment criteria were embedded in the diagnostic definitions for these disorders. Concerning other conditions, 2.7% of adolescents had manifested eating disorders at some point in their lifetime. These disorders were more than twice as prevalent among females and demonstrated modest increases with age.

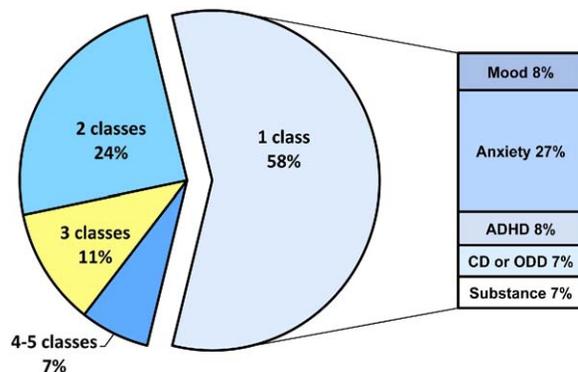
Finally, 49.5% of the total sample was affected by at least one class of disorder, but less than half had disorders with severe impairment (27.6%), and only 22.2% exclusive of substance use disorders. Approximately 20% of the sample (40% of all

affected individuals) also met criteria for a disorder from at least one additional class. These comorbidity rates were similar for males and females. No age differences were observed for adolescents affected by one class of disorder, but comorbidity with additional classes strongly increased with age.

Figure 1 presents the age-specific incidence curves for each of the broad classes of lifetime mental disorder. Anxiety disorders occurred earliest with a steep slope beginning in early childhood, and leveling off after age 12. Risk was fairly low for mood and behavior disorders until early adolescence, when it began to rise steadily. Substance use disorders appeared to have the latest age of onset, with a steep increase in incidence after age 15. The estimated risk at age 18 was 17.6% for behavior disorders, 18.2% for mood disorders, 23.8% for substance use disorders, and 26.2% for anxiety disorders. The median age of disorder onset was 6 years for anxiety disorders, 11 for behavior disorders, 13 for mood disorders, and 15 for substance use disorders (data not shown).

Figure 2 displays the proportion of adolescents affected by one or more broad classes of disorder. A small majority of affected adolescents (58%) met criteria for disorders from one class only, with anxiety disorders being the most frequent condition to occur alone (27%) and smaller proportions having only behavior disorders (7%),

FIGURE 2 Distribution of the major classes of DSM-IV disorders among adolescents with at least one disorder (N = 6,483).



mood disorders (8%), or substance use disorders (7%). Approximately one-quarter (24%) of adolescents affected by at least one class of disorder also met criteria for a disorder from one additional class; 11.0% were affected by three classes of disorders; and 7% were affected by four or five classes of disorder.

Sociodemographic Correlates

Table 3 presents the results of multivariate analyses of the association between individual and familial sociodemographic characteristics on classes of lifetime mental disorders in the adolescents. Mood and anxiety disorders were more prevalent among females in these multivariate analyses, whereas males had higher rates of behavior and substance use disorders. Rates of mood and substance use disorders were higher among older adolescents. There were few racial/ethnic differences in the major classes of mental disorders, with the exception of increased rates of anxiety disorders and lower rates of substance use disorder among non-Hispanic black adolescents compared with non-Hispanic white adolescents, and higher rates of mood disorders among Hispanic adolescents compared with non-Hispanic white adolescents.

With respect to parental characteristics, the prevalence rates of anxiety disorders, substance use disorders, and behavior disorders were higher for respondents whose parents were divorced or separated relative to respondents of currently married or cohabiting parents. Rates of mood disorders were lower among children of parents who were never married compared with currently married or cohabiting parents. Parental

poverty level and urbanicity were not associated with any of the classes of mental disorder. However, the most consistent association between parental characteristics and mental disorders in children emerged for parental education. Adolescents whose parents were not college graduates were at increased risk for all disorder classes.

The findings from multivariate analyses for these sociodemographic characteristics and classes of severe mental disorders (results not shown, but available upon request) were highly similar to those of all mental disorders, with limited exceptions. In particular, anxiety disorders were more prevalent in older adolescents, among "other" ethnic minorities, among adolescents whose parents were not college graduates, and among adolescents whose parents were divorced or separated.

Two-way interactions for any significant main effects were tested for each class of disorder. After adjusting for family-wise experimental error with a Bonferroni correction, no interactions were observed between individual and parental demographic correlates and anxiety or behavior disorders. There were four significant interactions for other disorders: (1) the prevalence of mood disorders was higher in white adolescents in homes with higher levels of parental education than that in black and Hispanic adolescents; (2) rates of substance use disorders increased more dramatically with age for males than females; (3) sex differences in substance use disorders were largest for black adolescents compared with other ethnic groups; and (4) increased rates of substance use disorders were observed among Hispanic adolescents whose parents were divorced; however, rates were decreased among black adolescents whose parents were never married or divorced.

DISCUSSION

These findings provide the first lifetime prevalence data on a broad range of mental disorders in a nationally representative sample of U.S. adolescents. The prevalence rates reported here closely approximate those of our nationally representative sample of adults using nearly identical methods, suggesting that the majority of mental disorders in adults emerge before adulthood. These rates are somewhat higher than those of prior studies, but within the range of estimates summarized in a meta-analysis of international community surveys of mental disorders in youth.¹ In addition, the NCS-A provides a more comprehensive assess-

TABLE 3 Multivariate Demographic Correlates of Lifetime Prevalence of DSM-IV Disorders in the National Comorbidity Survey–Adolescent Supplement (NCS-A)

Correlates	Category	OR (95% CI)				
		Mood	Anxiety	Behavior	Substance	Any class
Sex	Female			Reference		
	Male	0.5 (0.4-0.7)	0.6 (0.5-0.7)	1.7 (1.4-2.1)	1.3 (1.1-1.6)	0.9 (0.8-1.1)
	χ^2_1 (p)	27.51 (0.000)	50.65 (0.000)	24.84 (0.000)	8.38 (0.004)	1.80 (0.179)
Age	13-14 y			Reference		
	15-16 y	1.5 (1.2-2.0)	1.0 (0.8-1.3)	1.2 (0.9-1.5)	3.6 (2.5-5.2)	1.2 (1.0-1.5)
	17-18 y	1.8 (1.3-2.6)	1.0 (0.8-1.3)	1.3 (1.0-1.7)	7.2 (5.1-10.1)	1.6 (1.2-2.1)
	χ^2_2 (p)	14.16 (0.001)	0.12 (0.943)	3.13 (0.209)	163.68 (0.000)	13.20 (0.001)
Race/ethnicity	Hispanic	1.4 (1.1-1.8)	1.1 (0.9-1.3)	1.2 (0.8-1.9)	1.0 (0.7-1.4)	1.3 (0.9-1.9)
	Non-Hispanic Black	1.1 (0.8-1.5)	1.3 (1.0-1.5)	1.0 (0.7-1.5)	0.4 (0.3-0.5)	1.1 (0.8-1.5)
	Other	1.3 (0.8-2.2)	1.1 (0.8-1.4)	0.8 (0.5-1.3)	0.8 (0.5-1.2)	1.2 (0.8-1.8)
	Non-Hispanic White			Reference		
	χ^2_3 (p)	12.00 (0.007)	6.11 (0.106)	2.54 (0.468)	58.69 (0.000)	2.58 (0.462)
Parent education	Less than high school	0.9 (0.7-1.3)	1.3 (1.0-1.8)	1.7 (1.1-2.7)	1.5 (1.0-2.1)	1.6 (1.0-2.4)
	High school	1.1 (0.8-1.7)	1.3 (1.1-1.5)	1.5 (1.1-2.1)	1.4 (1.1-2.0)	1.3 (1.0-1.7)
	Some college	1.5 (1.1-2.2)	1.3 (1.1-1.6)	1.8 (1.4-2.4)	1.6 (1.2-2.1)	1.6 (1.3-1.9)
	College graduate			Reference		
	χ^2_3 (p)	10.29 (0.016)	12.92 (0.005)	20.08 (0.000)	11.80 (0.008)	19.71 (0.000)
Parent marital status	Currently married			Reference		
	Previously married	1.2 (0.9-1.7)	1.3 (1.1-1.6)	1.6 (1.1-2.2)	1.8 (1.3-2.6)	1.4 (1.1-1.8)
	Never married	0.4 (0.2-0.8)	1.0 (0.7-1.5)	0.9 (0.5-1.5)	1.2 (0.5-2.5)	0.9 (0.6-1.4)
	χ^2_3 (p)	11.23 (0.011)	8.75 (0.033)	8.74 (0.033)	10.77 (0.013)	11.93 (0.008)
Poverty index	PIR \leq 1.5	0.8 (0.5-1.3)	1.1 (0.9-1.4)	0.9 (0.6-1.3)	0.7 (0.5-1.1)	1.1 (0.8-1.6)
	PIR \leq 3	0.9 (0.7-1.3)	1.2 (1.0-1.5)	1.2 (0.9-1.7)	0.9 (0.6-1.3)	1.2 (1.0-1.5)
	PIR \leq 6	1.0 (0.8-1.3)	1.2 (1.0-1.4)	0.9 (0.7-1.2)	1.0 (0.8-1.4)	1.1 (0.9-1.3)
	PIR > 6			Reference		
	χ^2_3 (p)	1.27 (0.737)	3.73 (0.292)	6.49 (0.090)	5.38 (0.146)	3.03 (0.387)
Urbanicity	Metro	1.2 (0.7-2.0)	1.2 (1.0-1.5)	1.2 (0.9-1.7)	1.3 (0.9-1.9)	1.2 (0.9-1.5)
	Other urban	0.9 (0.6-1.5)	1.2 (1.0-1.5)	1.1 (0.8-1.5)	1.0 (0.7-1.5)	1.0 (0.7-1.4)
	Rural			Reference		
	χ^2_2 (p)	2.21 (0.331)	5.43 (0.066)	2.01 (0.366)	5.28 (0.071)	3.00 (0.223)

Note: PIR = poverty index ratio.

ment of a wide range of *DSM-IV* disorders and subtypes than most previous studies. Despite the high prevalence rates, however, only about one in every four to five youths meet criteria for a lifetime mental disorder that is associated with severe role impairment and/or distress. The prevalence of severe emotional and behavior disorders is even higher than the most frequent major physical conditions in adolescence, including asthma²⁴ or diabetes,²⁵ which have received widespread public health attention.

The finding that only about half of youth with a lifetime *DSM-IV* disorder report severe impairment confirms previous research demonstrating that a smaller proportion of youth with mental disorders actually have sufficiently severe distress or impairment to warrant immediate intervention.⁹ According to prior research, about one of every 10 youths with a current mental disorder fulfill criteria for Serious Emotional Disorder (SED) based on the Substance Abuse and Mental Health Services Administration (SAMSHA) definition (e.g., a mental health problem that has a drastic impact on a child's ability to function socially, academically, and emotionally).^{9,26} Although our study did not strictly assess all of the criteria for SED, our estimates of severe disorders were based on the full diagnostic criteria for *DSM-IV* disorders accompanied by severe impairment in major life roles.

Our data document the early onset of major classes of mental disorders. Among affected adolescents, 50% of disorders had their onset by age 6 for anxiety disorders, by age 11 for behavior disorders, by age 13 for mood disorders and by age 15 for substance use disorders. These findings closely approximate those of prospective studies of child and adolescent samples that have documented the incidence and progression of childhood mental disorders.^{2,27-29} The early age of onset of anxiety has been well established, and our findings on specific subtypes of anxiety closely track those of prospective community-based research that reveal differential peak periods of onset of specific subtypes of anxiety.²⁹⁻³¹ Prospective studies have also shown that the average age of onset of major depression and dysthymia is between 11 and 14 years,⁶ with a steady increase in incidence across adolescence that continues through early adulthood. Our cross-sectional data reflect this increase, with a near doubling of rates from 13 to 14 years (8.4%) to 17 to 18 years (15.4%). Also consistent with prior cross-sectional and prospective research,

the median onset of behavior disorders is slightly earlier than that of mood disorders, with a later peak for conduct disorder than for oppositional defiant disorder.³² Finally, the later onset and steeper increase in rates of substance use disorders across adolescence has been repeatedly demonstrated, despite different prevalence periods and assessment methods.³³

About 40% of affected youth in the NCS-A reported more than one class of lifetime disorder, with mood disorders being the most likely to co-occur with other classes. Nonrandom patterns of comorbidity between discrete classes of mental disorders have been documented extensively in prior community samples of youth.³⁴⁻³⁶ Future analyses of these data will investigate specific concurrent and prospective comorbidity patterns as well as their sociodemographic and clinical correlates.

In addition to providing prevalence estimates, the findings also confirm observations from previous U.S. and international investigations of adolescents concerning the association of sociodemographic characteristics and mental disorders.¹ In particular, female adolescents were more likely than males to have mood and anxiety disorders, but less likely to have behavioral and substance use disorders. Non-Hispanic black adolescents were less likely to have substance use disorders compared with white adolescents, a finding similar to those in prior community studies of adolescents and adults.³⁷ The increased prevalence of mood and substance use disorders in older adolescents has also been observed in previous investigations,³⁸ thus indicating the importance of prevention strategies for early and mid-adolescence. By contrast, the stability of certain anxiety and behavioral disorders across this same developmental period suggests that earlier interventions may be appropriate for many of these conditions.

The strong links between adolescent mental disorders and parental characteristics indicate the importance of the family context in the development of mental disorders. Our finding of a prominent effect of parental education on mental disorders has been well-documented for both child physical and mental health outcomes.^{39,40} Divorce was often associated with mental disorders in youth, particularly anxiety, behavior, and substance use disorders. The mechanisms underlying the impact of nonintact homes on mental disorders in youth, including both biologic or genetic vulnerability, and indirect influences on

disruptions in the home environment, warrant further study.^{9,41,42} However, the significant interactions observed among several sociodemographic characteristics attest to the complexity of these associations. For example, increased rates of substance use disorders among Hispanic adolescents whose parents were divorced may reflect interactions of individual, familial, and broader environmental influences that should be considered simultaneously in modeling the nature of risk and resilience in adolescent mental disorders.^{43,44} The lack of strong effects for some sociodemographic characteristics, such as poverty, may also be attributable to the multivariate statistical approach that adjusted for confounding variables.

The present findings should be interpreted in the context of several study-specific limitations. First, the cross-sectional nature of the survey limits our ability to document temporal ordering of mental disorders and putative risk and protective factors. Second, assessment of lifetime disorders is based on retrospective recall that is subject to numerous types of bias. Although we used a number of methods to increase the validity of retrospective reports of age of onset,²¹ it is unlikely that we were able to completely correct for recall biases. A third limitation is that surrogate information was obtained only from one parent using a self-administered questionnaire rather than a direct interview, and only for a limited number of disorders assessed in the survey. The lack of prior evidence for integrating parent and child reports based on different modes of administration led us to apply an empirical approach based on previous research on cross-informant diagnostic estimates.²³ In addition to study-specific limitations, a critical view is warranted concerning current diagnostic nomenclature more generally. Adolescence is a period of change and maturation in which emotional and behavioral difficulties may be common, and it is difficult to establish universally acceptable definitions of disorder or severity thresholds. The high comorbidity across classes of disorders also raises questions regarding the permeability of diagnostic categories and the plasticity of adolescent development. The pertinence of current and alternative developmentally appropriate diagnostic criteria for adolescent mental disorders deserves careful attention and would benefit from continued debate.

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Despite these limitations, our findings document the high prevalence of mental disorders in youth, and specify that slightly more than one in four to five adolescents in the general population experience disorders that result in severe impairment. Considered with recent estimates indicating that the annual economic burden of mental disorders on the well-being of American youth and their families approaches a quarter of one trillion dollars,⁴⁵ these findings underscore the key public health importance of mental health in American youth. The present data can inform and guide the development of priorities for future research and health policy by providing previously lacking prevalence estimates in a nationally representative sample of U.S. adolescents, as well as the individual, familial, and environmental correlates of mental disorders. Prospective research is now needed to understand the risk factors for mental disorder onset in adolescence, as well as the predictors of the continuity of these disorders into adulthood. &

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