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Sociodemographic and Psychopathologic Predictors of First Incidence of DSM-IV Substance Use, Mood, and Anxiety Disorders: Results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions

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Abstract

The objective of this study was to present nationally representative findings on sociodemographic and psychopathologic predictors of first incidence of DSM-IV substance, mood and anxiety disorders using the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. One-year incidence rates of DSM-IV substance, mood and anxiety disorders were highest for alcohol abuse (1.02) alcohol dependence (1.70), major depressive disorder (MDD: 1.51) and generalized anxiety disorder (GAD: 1.12). Incidence rates were significantly greater ($p < 0.01$) among men for substance use disorders and greater among women for mood and anxiety disorders except bipolar disorder and social phobia. Age was inversely related to all disorders. Black individuals were at decreased risk of incident alcohol abuse and Hispanic individuals were at decreased risk of GAD. Anxiety disorders at baseline more often predicted incidence of other anxiety disorders than mood disorders. Reciprocal temporal relationships were found between alcohol abuse and dependence, MDD and GAD, and GAD and panic disorder. Borderline and schizotypal personality disorders predicted most incident disorders. Incidence rates of substance, mood and anxiety disorders were comparable to or greater than rates of lung cancer, stroke, and cardiovascular disease. The greater incidence of all disorders in the youngest cohort underscores the need for increased vigilance in identifying and treating these disorders among young adults. Strong common factors and unique factors appear to underlie associations between alcohol abuse and dependence, MDD and GAD, and GAD and panic disorder. The major results of this study are discussed with regard to prevention and treatment implications.

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Keywords

Incidence; epidemiology; prospective study; substance use disorders; mood disorders; anxiety disorders

Introduction

Since World War II, numerous psychiatric epidemiology surveys have been conducted worldwide. Most have been cross-sectional, yielding rich data on prevalence and correlates of major psychiatric disorders. Conversely, prospective surveys that yield first incidence rates are less common. The dearth of psychiatric incidence surveys can be largely attributed to low incidence rates that require very large-scale prospective investigations to provide sufficient cases for analysis. Such studies are more resource intensive and complex than cross-sectional studies.

Most psychiatric incidence studies have focused on depressive disorders. Two of the best-known prospective studies were the Lundby Study in Sweden^{1, 2} and the Stirling County Study in Canada.^{3, 4} These 2 studies had follow-up periods of 18 and 25 years (between 1947 and 1997) and yielded 1-year incidence of depression, calculated as rates per 100 person-years (py) at risk, between 0.24 and 0.45. These early studies were groundbreaking, but they were based on diagnostic classifications that approximated, but did not assess DSM diagnoses, and were conducted many years ago. A more recent long-term prospective survey⁵ was conducted between 1981 and 1993 at the Baltimore site of the Epidemiologic Catchment Area (ECA) Study.⁶ This study, that used *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*⁷ (DSM-III) diagnoses at baseline and DSM-III-R⁸ diagnoses at follow-up, found 1-year incidence of major depression of 0.30. To place these rates in perspective, annual incidence rates are 0.06 for lung cancer;⁹ 5.0 for hypertension; 0.45 for stroke; and 1.5 for cardiovascular disease.¹⁰

Since the early 1980s, 4 prospective surveys of major depression, with 1 to 3 year follow-ups, were also conducted.^{11–15} These showed 1-year incidence of DSM-III major depression of 1.59 in the ECA¹⁰ and 2.79 in Edmonton, Canada.¹² One-year incidence of DSM-III-R major depression was 2.72 in the Netherlands^{13, 14}; and of *International Classification of Diseases, Tenth Revision*¹⁶ major depression, 2.05 in the Finnish ODIN Survey.¹⁵ Thus, the incidence of major depression was substantially higher in the more recent than in the Stirling County and Lundby studies. While it is unknown whether the greater rates in the more recent, shorter-term studies are due to methodologic or substantive factors, the data are consistent with the many cross-sectional studies^{17, 18} indicating higher prevalences of depression in more recent birth cohorts.

Incidence of anxiety disorders has rarely been studied. The incidence of panic disorder was 0.56 in the ECA,¹¹ 0.12 for men and 1.02 for women in Edmonton,¹² and 0.78 in the Netherlands¹³ and 0.24 in the Baltimore follow-up.^{19, 20} The 1-year incidence of social phobia was 0.94 in the ECA,²¹ 0.45 in the Baltimore Follow-Up Study,²² and 0.93 in the Netherlands.¹³ Only the Netherlands survey reported incidence of DSM-III-R specific phobia (2.20) and generalized anxiety disorder (GAD) (0.72).¹³

Incidence studies of substance use disorders are rare. In the ECA, 1-year incidence of alcohol abuse/dependence was 1.79; and of drug abuse/dependence, 1.09.¹¹ Corresponding rates were 4.48 and 1.27 among men, and 1.36 and 0.82 among women, in Edmonton.¹² Incidence was reported separately for alcohol dependence (0.46) in the Baltimore Follow-Up Study.²³ A study in Taiwan found 1-year incidence of alcohol abuse/dependence ranging from 2.8 to 4.8 among

4 aboriginal groups.²⁴ Figures for alcohol abuse (2.38), alcohol dependence (0.49), drug abuse (0.28), and drug dependence (0.27) were derived from the Netherlands survey.^{13, 14} This great variation in rates could have reflected differences in sample designs and measures, causal factors including availability and social norms regarding substance use, and variation in genetic vulnerability to substance use disorders.

Although prior longitudinal surveys contributed important information on the incidence of psychiatric disorders in the general population, their small samples, differences in assessment instruments and sampling techniques, varying decades of baseline assessment, and varying lengths of follow-up, preclude clear conclusions on the current incidence of mental disorders in the United States. In addition, previous studies provided little information beyond sex and age as sociodemographic risk factors for first-incident disorders. Finally, these studies provided limited information on the role of comorbidity in the etiology of mental disorders. The risk posed by existing disorders for onsets of new disorders has been among the most debated issues in psychiatry. As is widely acknowledged, cross-sectional studies cannot address such issues; a very large-scale prospective study with DSM-IV diagnoses is needed. Until now, such a study has been lacking.

Accordingly, the current study is based on the 3-year prospective follow-up (n=34,653)²⁵ of the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; n=43,093).^{26, 27} The goals of this study were to: (1) estimate, for the first time in a national study, the annual (1-year) first incidence of specific major DSM-IV²⁵ substance use, mood, and anxiety disorders in a sample large enough to produce stable estimates; (2) provide information on an expanded range of sociodemographic risk factors; and (3) provide estimates of the risks posed by specific Axis I and Axis II psychiatric disorders for subsequent onsets of comorbid disorders. Information on risk factors for first-onset specific psychiatric disorders can inform the development of evidence-based prevention and education programs targeting sociodemographic and psychopathologic precursors. Knowledge of psychopathologic risk factors can also guide etiologic investigations of common and unique genetic and environmental influences underlying comorbidity, and provide more etiologically-derived phenotypes for genetic research.

Method

Sample

The 2004–2005 Wave 2 NESARC²⁵ is the second wave of the NESARC. Wave 1 of the NESARC was conducted in 2001–2002 and is described in detail elsewhere.^{26, 27} The Wave 1 NESARC surveyed a representative sample of the adult population of the United States, oversampling Blacks, Hispanics, and young adults aged 18-to-24 years. The target population was the civilian population, 18 years and older, residing in households and group quarters. Face-to-face interviews were conducted with 43,093 respondents, yielding an overall response rate of 81.0%.

The Wave 2 NESARC design involved face-to-face reinterviews with all participants in the Wave 1 interview. Excluding respondents ineligible for the Wave 2 interview because they were deceased (n=1,403), deported, mentally or physically impaired (n=781), or on active duty in the armed forces throughout the follow-up period (n=950), the Wave 2 response rate was 86.7%, reflecting 34,653 completed interviews. The cumulative response rate at Wave 2 was the product of the Wave 2 and Wave 1 response rates, or 70.2%. The mean interval between Wave 1 and Wave 2 interviews was 36.6 (SE=2.62) months. Wave 2 NESARC data were weighted to reflect design characteristics of the NESARC and account for oversampling. Adjustment for nonresponse across sociodemographic characteristics and the presence of any lifetime Wave 1 NESARC substance use disorder or other psychiatric disorder was performed

at the household and person levels.²⁵ Weighted data were then adjusted to be representative of the civilian population of the United States on socioeconomic variables based on the 2000 Decennial Census.

The Wave 2 NESARC weights include a component that adjusts for nonresponse, for sociodemographic factors and psychiatric diagnoses, to ensure that the sample approximates the target population, i.e., the original sample minus attrition between the two waves due to death, institutionalization/incapacitation, deportation/permanently leaving the U.S., and being in the military for the full length of the Wave 2 interviewing period. In order to test whether this nonresponse adjustment was successful, we compared Wave 2 respondents with the target population (comprising Wave 2 respondents and eligible nonrespondents) in terms of number of baseline (Wave 1) sociodemographic and diagnostic measures. The resulting comparison indicated that there were no significant differences between the Wave 2 respondents and the target population on age, race-ethnicity, sex, socioeconomic status or the presence of any lifetime substance, mood, anxiety or personality disorder (each examined separately).

Psychiatric Disorders

The diagnostic interview was the Alcohol Use Disorder and Associated Disabilities Interview Schedule DSM-IV Version (AUDADIS-IV²⁹), Wave 2 version.³⁰ This structured interview was designed for experienced lay interviewers. Axis I disorders were assessed identically in the Wave 1 and Wave 2 versions of the AUDADIS-IV except for the time frames. In Wave 1, these time frames were: (1) the year preceding the interview; and (2) the past, including all but the year preceding the interview. In Wave 2, the time frames were: (1) the year preceding the Wave 2 interview; and (2) the intervening period of about 2 years between the Wave 1 interview and the year preceding the Wave 2 interview. Thus, in the Wave 2 interview, the entire time between Waves 1 and 2 was covered for each respondent.

Extensive AUDADIS-IV questions covered DSM-IV criteria for alcohol and drug-specific abuse and dependence for 10 classes of substances. Consistent with Wave 1 diagnoses, a 12-month DSM-IV abuse diagnosis required 1 or more of 4 abuse criteria, while a DSM-IV dependence diagnosis required 3 or more of 7 dependence criteria, to be met in the year preceding the Wave 2 interview. For the intervening period, criteria for abuse or dependence must have been met within 1 year. Drug-specific abuse and dependence were aggregated to yield diagnoses of any drug abuse and any drug dependence. Although DSM-IV diagnoses of abuse are preempted hierarchically by diagnoses of dependence, prospective studies^{31, 32} have shown that individuals with histories of dependence can develop abuse without dependence, and vice versa. Therefore, the hierarchical relationship between alcohol and drug abuse and dependence was not invoked in estimation of incidence for these disorders.

The good to excellent ($\kappa=0.70-0.91$) test-retest reliability of AUDADIS-IV substance use diagnoses is documented in clinical and general population samples.³³⁻³⁸ Convergent, discriminant, and construct validity of AUDADIS-IV substance use disorder criteria and diagnoses were good to excellent,³⁹⁻⁴³ including in the World Health Organization/National Institutes of Health International Study on Reliability and Validity,⁴⁴⁻⁴⁹ where clinical reappraisals documented good validity of DSM-IV alcohol and drug use disorder diagnoses ($\kappa=0.54-0.76$).^{33, 44}

In Waves 1 and 2, mood disorders included DSM-IV primary major depressive disorder (MDD), dysthymia, bipolar I, and bipolar II disorders. Anxiety disorders included DSM-IV primary panic disorder (with and without agoraphobia), social and specific phobias, and GAD. AUDADIS-IV methods to diagnose these disorders are described in detail elsewhere.^{17, 22, 50-54} Consistent with DSM-IV, "primary" AUDADIS-IV diagnoses excluded disorders that

are substance-induced or due to general medical conditions. Diagnoses of MDD ruled out bereavement.

Past year and prior-to-past year diagnoses of attention-deficit/hyperactivity disorder (ADHD) and posttraumatic stress disorder (PTSD) were assessed in the Wave 2 NESARC. Because ADHD and PTSD were not assessed in both waves of the NESARC incidence and risk estimates are not presented for them. Nevertheless, diagnoses of these disorders prior to the year preceding the Wave 2 interview were included as predictors in multiple logistic analyses described below.

Personality disorders (PDs) assessed on a lifetime basis at Wave 1 and described in detail elsewhere^{55–57} included avoidant, dependent, obsessive-compulsive, paranoid, schizoid, histrionic, and antisocial PDs. Borderline, schizotypal, and narcissistic PDs were measured at Wave 2. Lifetime measures of each PD were only included as predictors in the multiple logistic analyses of risk of 1-year incidence of each substance use, mood, and anxiety disorder.

Test-retest reliabilities for AUDADIS-IV mood, anxiety, PD, and ADHD diagnoses in the general population and clinical settings were fair to good ($\kappa=0.40–0.77$).^{33, 35, 38} Test-retest reliabilities of AUDADIS-IV PDs compare favorably with those obtained in patient samples using semistructured personality interviews.⁵⁸ Convergent validity was good to excellent for all affective, anxiety, and PD diagnoses,^{17, 50–57} and selected diagnoses showed good agreement ($\kappa=0.64–0.68$) with psychiatrist reappraisals.³³

Incidence

Incidence rates were calculated 2 ways. Using the first method,^{59, 60} the numerator was the number of new cases (I = individuals who had a specific disorder for the first time in their lives) during the year preceding the Wave 2 interview. The denominator for each disorder comprised the total number of individuals with no prior history of that disorder at the start of the year (T = the population at risk). This incidence rate was expressed as a percentage:

$$\frac{I}{T} \times 100.$$

The second method, using person-years, reflects the understanding that the optimal denominator of an incidence rate is the population's total period of exposure, usually expressed as py at risk. In this method,^{61–63} a person is no longer at risk for becoming a case after developing the disorder during the specified year, and therefore should no longer be included in the denominator. The assumption is usually made^{11–14, 21–23} that the average point when a new case emerges lies halfway through the year. Accordingly, we calculated py at risk among incident cases as one-half the time elapsed during the year preceding the Wave 2 interview. The exposure period for nonincident cases in the group at risk was estimated by letting each individual represent exactly one year of exposure. This rate was expressed as incidence per

$$100 \text{ py at risk, } \frac{I}{T - 0.5(I)} \times 100.$$

Statistical Analyses

Weighted 1-year incidence rates expressed as percentages of the groups at risk and per 100 py at risk are presented. Multiple logistic regression analyses examined the relative risk of first incidence of each psychiatric disorder predicted by sociodemographic characteristics. All sociodemographic variables were entered simultaneously into a single model for each disorder. Although multiple logistic regressions yield adjusted odds ratios, it has been shown that, when the incidence of a disorder is < 10%, as are all incidence rates reported herein, the adjusted odds ratio closely approximates the adjusted relative risk and no correction to improve the

approximation is necessary.⁶⁴ Thus, the adjusted odds ratios derived from multiple logistic analyses are referred to hereinafter as adjusted relative risks.

To address issues related to comorbidity, adjusted relative risks were estimated, using multiple logistic regression, for each 1-year incident disorder at Wave 2 associated with other disorders present at “baseline.” Baseline diagnoses were defined as Axis I and II disorders occurring prior to the year preceding the Wave 2 interview and included Wave 1 lifetime disorders plus disorders occurring during the 2-year period since Wave 1 but before the incident year preceding the Wave 2 interview. These analyses were conducted in 2 ways. The first controlled for sociodemographic characteristics. The second further controlled for all other comorbid baseline disorders. This analysis addresses the fact that control only sociodemographic characteristics yields no information on the unique relationships of other disorders that themselves have considerable comorbidity. All standard errors and 99% confidence intervals were adjusted for the design effects of the Wave 2 NESARC sample.

Results

Incidence

The 1-year incidence rates and 1-year incidence rates per 100 py were very similar given the small numbers of incident cases (Table 1), and are reported hereinafter as rates per 100 py at risk. Incidence was highest for alcohol dependence (1.70), alcohol abuse (1.02), MDD (1.51), and GAD (1.12); and lower for other disorders, ranging from 0.21 for bipolar II to 0.62 for panic disorder.

Sociodemographic Predictors

Respondents with incident alcohol abuse and dependence were more likely to be younger, male, never married, or separated/divorced/widowed (Table 2); the risk of incident alcohol abuse was lower among Blacks. The risk of incident drug dependence was greater for men. Respondents in the youngest age group and those who were separated/divorced/widowed were also more likely to have incident drug abuse and dependence.

Risk of incident MDD was greater among women, but no sex differences were observed for bipolar I or II disorders (Table 3). The risk for each incident mood disorder was also greater in the 2 youngest age groups. Further, risk of MDD was greater among respondents with the lowest incomes and those who were separated/divorced/widowed, whereas the risk of bipolar I was greater among those with less than a high school education.

Women were at increased risk of all incident anxiety disorders except social phobia (Table 4). Risks of incident panic disorder and social phobia were greater among respondents 20-to-54 years-old, whereas increased risks of specific phobia and GAD were only observed among 30-to-54 year-olds. Except for specific phobia, the risks of incident anxiety disorders were increased among respondents with incomes \leq \$19,999/year. The risk of incident GAD was also greater among respondents who were separated/divorced/widowed and lower among Hispanics.

Psychopathologic Predictors

Associations of incident DSM-IV disorders with specific baseline disorders, controlling for sociodemographic characteristics and psychiatric comorbidity, are outlined in Tables 5, 6, and 7. Many adjusted odds ratios were reduced or no longer significant when other baseline comorbidity was controlled. Lifetime alcohol abuse at baseline remained a strong predictor of incident alcohol dependence and vice versa. Baseline drug abuse also remained a strong predictor of incident alcohol abuse and drug dependence.

Baseline bipolar I disorder remained a significant predictor of incident drug abuse and baseline panic disorder predicted incident drug dependence. Risk of incident alcohol abuse was decreased among respondents with baseline bipolar II disorder. Among PDs, borderline PD remained a significant predictor of incident alcohol dependence and drug abuse, and schizotypal and narcissistic PDs remained significant predictors of incident drug abuse and drug dependence. The risk of incident alcohol abuse was decreased among respondents with dependent PD.

Similar attenuation in associations between baseline psychopathologic predictors and incident mood and anxiety disorders was observed when baseline comorbidity was controlled. Increased risk of incident MDD was associated with baseline dysthymia and anxiety disorders except social phobia (Table 6). Increased risks of incident MDD and bipolar I disorder were observed among respondents with schizotypal and borderline PDs. Risk of incident bipolar I disorder was also increased among respondents with baseline PTSD, ADHD, and narcissistic PD. Further, risk for incident MDD was decreased among respondents with paranoid PD.

The risk of incident panic disorder was increased among respondents with baseline bipolar I disorder, GAD, PTSD, and schizotypal and borderline PDs (Table 7). Baseline panic disorder and schizotypal and borderline PDs predicted incident social phobia. Risk of incident specific phobia was increased among respondents with baseline panic disorder, PTSD, and borderline PD. Increased risk of incident GAD was observed among respondents with baseline MDD, bipolar I, panic disorder, and social phobia, and with schizotypal, borderline, and narcissistic PDs. Risk of incident GAD was decreased among respondents with histrionic PD.

Discussion

The most common incident disorders in this study were MDD, alcohol abuse and dependence, and GAD. The incidence of MDD was 1.51, virtually identical to the rate in the ECA (1.52),¹¹ but lower than the rates in Edmonton (2.79),¹² the Netherlands (2.72),¹³ and Finland (2.05),¹⁵ and higher than those observed in the older long-term follow-up studies (0.24–0.45)^{1–3,5} The incidence of panic disorder (0.62) was similar to rates in the ECA (0.56)^{11, 19, 20} and the Netherlands (0.78)¹³ surveys. The incidence of social phobia (0.32) was comparable to the rate in the Baltimore Follow-Up Survey (0.45)¹¹ but lower than those in the ECA (0.94)¹¹ and the Netherlands (0.93).¹³ One-year incidence of alcohol dependence was 1.70, higher than was observed in the Baltimore (0.46)²³ or the Netherlands (0.49)¹³ surveys. This study also found a lower incidence of alcohol abuse (1.02) than in the Netherlands survey (2.38). Incidence rates for drug abuse and dependence in this study (0.28, 0.32) and others (0.28, 0.27)¹³ were low. The lower rates reported for most disorders in the long-term studies could be attributed, in part, to smaller numbers of incident cases and the inevitable impact of attrition. Discrepancies in incidence rates between surveys may also reflect differences in survey design, and/or environmental or genetic factors. Differences may also be due to diagnostic criteria used in the current study (i.e., DSM-IV) and prior studies that used earlier DSM classifications or ICD-10 criteria.

Consistent with most prior cross-sectional^{27, 50–54, 65–71} and longitudinal research,^{2,11–14} incidence rates of MDD and anxiety disorders except social phobia were greater among women, while incidence rates of most substance use disorders were greater among men. Also consistent with these prevalence surveys, there were no sex differences in the incidence of bipolar I and II disorders. However, unlike earlier prospective studies,^{11–13} this study found inverse relationships of all assessed disorders with age. Although cross-sectional studies^{17, 18, 27, 50–54} have consistently reported inverse relationships of most disorders with age, it remained unclear whether these associations were real, artifactual due to longer duration of illness, or due to mortality, recall, or other biases. The findings on age derived from prospectively

determined incidence rates strongly suggest that the observed age differentials represent true differences in first incidence, with greater incidence among younger cohorts.

This study also identified other sociodemographic risk factors for DSM-IV disorders not generally reported in prior research due to limitations in sample size. Incidences of alcohol and drug abuse and dependence, MDD, and GAD were greater among separated/divorced/widowed individuals, a result that extended to never-married individuals for alcohol abuse and dependence. While these findings do not entirely clarify the causal relationship between marital status and psychopathology, they indicate that the relationship is not due solely to unmarried status resulting from preexisting psychopathology. Also, low family income was significantly related to risks of most anxiety disorders and MDD, but not other mood or substance use disorders. Incident bipolar I disorder, however, was associated with less than a high school education. Taken together, these results highlight age as an important general risk factor for DSM-IV substance use, mood, and anxiety disorders, whereas effects of sex and lower socioeconomic status appear to be disorder-specific. Future analyses of the NESARC data will test whether other prospectively assessed risk factors for psychiatric disorders are disorder-specific to help define the boundaries of DSM-IV disorders.

Little has been reported about incidence rates among race-ethnic minorities. In contrast to the 1 prior study,⁷² this study did not find elevated rates among Hispanics. However, the risk of incident GAD was lower among Hispanics and the risk of alcohol abuse was lower among Blacks. Future research is needed to explain the lower risk of these disorders among minorities.

To our knowledge, this is the first study to examine psychopathologic predictors of a broad range of incident DSM-IV disorders in a national sample and determine whether disorder-specific associations reflected common or unique factors. Some associations between psychopathologic predictors of incident disorders remained statistically significant, although reduced in magnitude, once baseline comorbidity was controlled. The drops in magnitude suggests common causal factors underlying the disorder-specific associations. However, the remaining significance of these associations suggests unique factors driving disorder-specific associations.

Consistent with the ECA data,⁷² baseline dysthymia predicted incident MDD. Also not surprisingly, baseline MDD predicted incident bipolar II disorder, suggesting that MDD occurs prior to hypomania in the development of bipolar II disorder. Consistent with prospective studies,^{28,29} alcohol abuse and dependence showed strong reciprocal temporal relationships but drug abuse only predicted incident drug dependence. The reciprocal relationship between alcohol abuse and dependence suggests that strong common factors may underlie the comorbid relationship and additionally provides support for elimination of the hierarchy between alcohol abuse and dependence in future DSM revisions. Further research is needed, however, on specific drug use disorders to support elimination of the abuse-dependence hierarchy in the DSM-IV in view of the unidirectional relationship between drug abuse and dependence observed in this study.

In general, baseline anxiety disorders more often predicted other incident anxiety disorders than mood disorders. Panic disorder predicted incident social and specific phobias and GAD, GAD predicted incident panic disorder, social phobia predicted incident GAD, and PTSD predicted incident panic disorder and specific phobia. Baseline social phobia predicted incident GAD. In only 3 instances did a mood disorder predict an incident anxiety disorder: bipolar I predicted both incident panic disorder and GAD, and MDD predicted incident GAD. These results are broadly consistent with most,⁷³⁻⁷⁹ but not all,^{80, 81} longitudinal studies showing that onsets of anxiety disorders are more often followed than preceded by the onset of

depressive disorders. The observed temporal relationships, especially among anxiety disorders, may also reflect overlap of core DSM-IV symptoms among these disorders.

One of the most interesting findings of this study was the reciprocal temporal relationships between MDD and GAD, and GAD and panic disorder. These findings suggest the existence of strong common causes underlying those disorders, stronger than those common factors characterizing comorbidity among other disorders assessed in this study except for alcohol abuse and dependence. The observed reciprocal relationship between MDD and GAD is consistent with results of twin studies showing these disorders to share joint genetic susceptibility.^{82–86} Findings on the relationship between GAD and panic disorder show GAD to be etiologically distinct from panic disorder,⁸⁶ but more recent studies support a shared diathesis between GAD and panic disorder⁸⁷ or additive genetic influences common to GAD and panic disorder in the presence of a nonadditive genetic contribution specific to panic disorder.⁸⁸ The present results suggest that genetic research be expanded to encompass MDD, GAD, and panic disorder, along with other mood and anxiety disorders, for the purpose of unraveling common and unique genetic and environmental influences underlying comorbidity.

By definition, PDs constitute enduring patterns of inner experiences and behaviors that are pervasive, inflexible and stable over time, with onsets in adolescence or early adulthood,¹ and highly comorbid with mood and anxiety disorders.^{17, 18, 27, 50–54} Therefore, it was not surprising that PDs predicted these incident disorders. Borderline and schizotypal PDs predicted incident MDD, bipolar I, panic disorder, GAD, and social phobia. Borderline PD also predicted incident specific phobia, and narcissistic PD predicted incident bipolar I and GAD. That PDs predicted many mood and anxiety disorders tempts speculation that genetic risk shared among anxiety and mood disorders^{85,88} might be mediated by PDs, especially borderline and schizotypal PDs or traits.

Longitudinal and twin studies^{89–96} have consistently found antisocial behavior or conduct disorder in childhood or late adolescence to predict alcohol dependence in early adulthood. By contrast, antisocial PD did not predict incident alcohol or drug use disorders in this study. This discrepancy suggests that the relationship between childhood antisocial behavior and later substance use disorders may not be consistent across developmental stages.⁹⁷ Adolescence and early adulthood are periods associated with the highest prevalence of substance use and the relationship measured at these stages of life may be different from what would be observed in later adulthood. Thus, this linkage between antisocial behaviors and substance use disorders may be evident among younger individuals not captured in the NESARC sample. However, antisocial behavior in prior studies may be predicting early-onset substance use disorders, leaving open the possibility that other personality psychopathology, such as borderline, narcissistic, or schizotypal PD or traits, could influence the development of later-onset substance use disorders as observed in this study. Future longitudinal research should be extended to adolescence and later adulthood and incorporate measures of a broad spectrum of personality psychopathology, with particular focus on sex and age differences in the manifestations of externalizing and internalizing psychopathology predictive of substance use disorders.

Another significant finding is that substance use disorders did not predict any incident mood or anxiety disorder. By contrast, baseline bipolar I predicted incident drug abuse, and baseline panic disorder predicted incident drug dependence. These results are consistent with recent evidence from a twin study showing that the risk of alcohol dependence was substantially increased by a prior episode of MDD, but a previous episode of alcohol dependence did not increase the risk of MDD.⁹⁸ Although these results may be consistent with the self-medication hypothesis, other mechanisms such as shared underlying liability arising from the same genetic or environmental risk factors cannot be excluded.

Limitations of this study are noted. Although this study represents the largest follow-up survey of psychiatric disorders conducted to date, future prospective research with longer follow-up periods and those incorporating clinical interviews and collateral reports are also indicated. Since attrition between the Wave 1 and Wave 2 NESARC was small (13.3%) and the Wave 2 data were adjusted for nonresponse due to sociodemographic characteristics and presence of any substance use or other psychiatric disorder at Wave 1, attrition is not likely to have had as substantial effect on the incidence rates and risk associations examined in this study. Although the NESARC survey design included group quarters, some special populations, such as those under 18 or respondents in jail or hospitalized at the time of the interview, were not included in the sample. Finally, this study assessed DSM-IV disorders categorically, in conformity with clinical tradition. It is acknowledged that a dimensional approach to the measurement of DSM-IV disorders may have great merit for understanding the pathophysiology of each disorder and the comorbidity it shares with others.

In summary, this study has increased our knowledge of sociodemographic and psychopathologic risk factors for major DSM-IV substance use, mood, and anxiety disorders. The greater incidence of all these disorders in the youngest cohort underscores the need for heightened vigilance in identifying and treating such disorders among young adults. This study also provides a framework for future analyses focusing prospectively on other risk factors for the incidence, remission, and recurrence of specific disorders. Taken together, the findings of this study call for more research in the rapidly growing field of psychiatric genetics that has begun to expand phenotypic definitions beyond the study of a single disorder or trait to a range of phenotypes that show a high degree of comorbidity. Work in this area is beginning to identify latent genetic risk factors that indicate shared genetic susceptibility across a range of diagnostic phenotypes.^{99–104}

Information on sociodemographic and psychopathologic risk factors prospectively identified in this study may also begin to inform a new class of preventive interventions aimed at preventing comorbidity (i.e., the prevention of the first onset of a second or set of disorders). With regard to clinical implications, clearer data about the risks of future disorders posed by chronologically primary disorders can increase efficiency of treatment planning and provide important information to patients at risk of developing secondary disorders. Primary prevention of secondary disorders would be feasible even when the comorbid conditions share common causes. The onset of the secondary disorder is not inevitable because common causes often have modifiable mediators.

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Table 1

One-Year Incidence of DSM-IV Psychiatric Disorders.

Disorder	Unweighted Number of Respondents at Risk	Unweighted Number of 12-Month Incident Cases	Weighted First Incident Rate % (SE)	Unweighted Person-Years Exposure	Weighted Person-Years Exposure	Weighted Annual Incidence/100 Person-Years
Alcohol use disorder ^a	23,713	363	1.65 (0.10)	23531.50	137208646.83	1.66 (0.11) ^b
Alcohol abuse	24,291	233	1.02 (0.10)	24174.50	141022701.45	1.03 (0.1)
Alcohol dependence	30,220	481	1.70 (0.09)	29979.50	177706350.02	1.72 (0.09)
Any drug use disorder ^a	30,830	89	0.31 (0.04)	30785.50	183210336.56	0.31 (0.04)
Any drug abuse	30,887	75	0.28 (0.04)	30849.50	183613800.84	0.28 (0.04)
Any drug dependence	33,639	101	0.32 (0.04)	33588.50	201188877.60	0.32 (0.04)
Any mood disorder ^a	26,867	666	2.21 (0.12)	26534.00	161163346.22	2.24 (0.12)
Major depressive disorder	28,859	489	1.51 (0.08)	28614.50	173183513.88	1.52 (0.09)
Bipolar I	32,990	189	0.53 (0.05)	32895.50	197561320.45	0.53 (0.05)
Bipolar II	34,045	74	0.21 (0.03)	34008.00	204341429.64	0.21 (0.03)
Any anxiety disorder ^a	26,179	452	1.57 (0.09)	25953.00	157122642.88	1.58 (0.09)
Any panic disorder	32,302	224	0.62 (0.05)	32190.00	193400490.26	0.62 (0.05)
Social phobia	32,352	112	0.32 (0.04)	32296.00	193763316.84	0.32 (0.04)
Specific phobia	29,502	147	0.44 (0.05)	29428.50	177854709.16	0.44 (0.05)
Generalized anxiety	32,361	390	1.12 (0.07)	32166.00	193315672.84	1.13 (0.08)

^a Because the population at risk for each aggregate disorder category excludes all respondents with prior lifetime histories of any disorder in that category, the denominator of the incidence rate is invariably smaller than the denominator for any component disorder. For the same reason and because individuals can become incident cases of more than one disorder in each category in the same time period, the numerator for the aggregate rate is not a simple sum of the numbers of incident cases across the specific disorders.

^b Numbers in parentheses are standard errors.

Table 2
 One-Year Incidence and Associations of DSM-IV Substance Use Disorders and Sociodemographic Characteristics.

Characteristic	Alcohol Abuse			Alcohol Dependence			Any Drug Abuse			Any Drug Dependence		
	% (SE) ^a	OR ^b (99% CI) ^c	% (SE)	OR (99% CI)	% (SE)	OR (99% CI)	% (SE)	OR (99% CI)	% (SE)	OR (99% CI)		
Sex												
Men	1.6 (0.19)	2.3 (1.59–3.40)	2.5 (0.16)	2.4 (1.75–3.16)	0.3 (0.06)	1.2 (0.54–2.53)	0.5 (0.08)	2.7 (1.16–6.37)	0.2 (0.04)	1.0		
Women	0.6 (0.07)	1.0	1.1 (0.09)	1.0	0.3 (0.05)	1.0	0.2 (0.04)	1.0	0.2 (0.04)	1.0		
Age, y												
20–29	3.1 (0.40)	11.7 (3.70–36.67)	4.8 (0.39)	8.7 (5.16–14.77)	1.0 (0.20)	50.7 (7.21–156.41)	1.0 (0.19)	8.4 (1.31–53.65)	0.2 (0.05)	2.4 (0.52–11.55)		
30–54	1.0 (0.12)	4.3 (1.58–11.83)	1.6 (0.13)	3.5 (2.10–5.76)	0.2 (0.06)	14.4 (2.39–86.41)	0.2 (0.05)	2.4 (0.52–11.55)	0.1 (0.05)	1.0		
55+	0.2 (0.08)	1.0	0.5 (0.07)	1.0	0.0 (0.01)	1.0	0.1 (0.05)	1.0	0.1 (0.05)	1.0		
Race-ethnicity												
White	1.0 (0.11)	1.0	1.5 (0.09)	1.0	0.3 (0.05)	1.0	0.3 (0.05)	1.0	0.3 (0.05)	1.0		
Black	0.8 (0.16)	0.6 (0.34–0.95)	2.7 (0.31)	1.3 (0.90–1.97)	0.2 (0.07)	0.5 (0.18–1.55)	0.4 (0.10)	0.9 (0.37–2.08)	0.4 (0.10)	0.9 (0.37–2.08)		
Hispanic	1.1 (0.19)	0.8 (0.46–1.48)	2.4 (0.32)	1.2 (0.77–1.76)	0.4 (0.11)	1.1 (0.44–2.98)	0.3 (0.08)	0.7 (0.27–1.65)	0.3 (0.08)	0.7 (0.27–1.65)		
Family income, \$												
0–19,999	0.9 (0.15)	0.7 (0.39–1.34)	2.4 (0.25)	1.3 (0.81–2.24)	0.4 (0.11)	2.0 (0.53–7.22)	0.7 (0.15)	2.2 (0.74–6.68)	0.4 (0.10)	1.4 (0.45–4.32)		
20,000–34,999	1.1 (0.24)	1.0 (0.49–1.83)	1.2 (0.16)	0.7 (0.43–1.20)	0.2 (0.07)	1.0 (0.29–3.69)	0.4 (0.10)	1.4 (0.45–4.32)	0.1 (0.05)	0.6 (0.18–1.98)		
35,000–69,999	1.0 (0.17)	0.9 (0.48–1.51)	1.8 (0.18)	1.1 (0.70–1.67)	0.3 (0.07)	1.4 (0.49–4.27)	0.1 (0.05)	0.6 (0.18–1.98)	0.2 (0.07)	1.0		
70,000+	1.2 (0.16)	1.0	1.5 (0.16)	1.0	0.2 (0.06)	1.0	0.2 (0.07)	1.0	0.2 (0.07)	1.0		
Marital status												
Married/cohabiting	0.6 (0.08)	1.0	1.2 (0.10)	1.0	0.1 (0.03)	1.0	0.1 (0.03)	1.0	0.1 (0.03)	1.0		
Separated/divorced/widowed	0.9 (0.16)	3.1 (1.64–5.74)	1.6 (0.20)	2.0 (1.28–3.19)	0.3 (0.10)	3.5 (1.03–11.88)	0.4 (0.12)	4.0 (1.26–12.72)	0.4 (0.12)	4.0 (1.26–12.72)		
Never married	2.7 (0.37)	2.3 (1.31–4.02)	4.1 (0.36)	1.7 (1.12–2.55)	0.8 (0.16)	2.0 (0.75–5.57)	0.9 (0.17)	2.8 (0.89–8.91)	0.9 (0.17)	2.8 (0.89–8.91)		
Education												
Less than high school	0.6 (0.13)	0.6 (0.32–1.22)	1.9 (0.28)	1.2 (0.72–1.90)	0.1 (0.04)	0.4 (0.12–1.25)	0.4 (0.15)	1.3 (0.44–3.67)	0.3 (0.06)	0.9 (0.39–2.11)		
High school	0.7 (0.13)	0.7 (0.38–1.15)	1.7 (0.17)	1.1 (0.75–1.58)	0.3 (0.07)	1.0 (0.45–2.07)	0.3 (0.06)	0.9 (0.39–2.11)	0.3 (0.06)	0.9 (0.39–2.11)		
Some college or beyond	1.3 (0.13)	1.0	1.7 (0.11)	1.0	0.3 (0.05)	1.0	0.3 (0.06)	1.0	0.3 (0.06)	1.0		
Urbanicity												
Urban	1.0 (0.11)	1.1 (0.61–2.06)	1.7 (0.10)	1.2 (0.72–1.89)	0.3 (0.04)	1.0 (0.39–2.62)	0.3 (0.05)	1.5 (0.57–4.00)	0.2 (0.07)	1.0		
Rural	1.0 (0.19)	1.0	1.6 (0.25)	1.0	0.3 (0.09)	1.0	0.2 (0.07)	1.0	0.2 (0.07)	1.0		
Region												
Northeast	1.0 (0.17)	1.2 (0.61–2.47)	1.6 (0.23)	1.0 (0.62–1.61)	0.4 (0.13)	1.2 (0.40–3.79)	0.4 (0.09)	1.0 (0.43–2.35)	0.4 (0.09)	1.0 (0.43–2.35)		
Midwest	1.3 (0.23)	1.7 (0.87–3.13)	2.0 (0.25)	1.2 (0.78–1.93)	0.3 (0.10)	0.9 (0.30–2.97)	0.5 (0.13)	1.3 (0.50–3.50)	0.2 (0.06)	0.5 (0.19–1.57)		
South	1.0 (0.14)	1.2 (0.66–2.09)	1.7 (0.14)	1.0 (0.68–1.35)	0.2 (0.05)	0.7 (0.25–1.71)	0.2 (0.06)	0.5 (0.19–1.57)	0.2 (0.06)	0.5 (0.19–1.57)		
West	0.8 (0.15)	1.0	1.6 (0.16)	1.0	0.3 (0.08)	1.0	0.4 (0.08)	1.0	0.4 (0.08)	1.0		

Note: Figures in boldface are significant at $p < 0.01$.

^a SE = standard error.

^b OR = odds ratio.

^c CI = 99% confidence interval.

Table 3
One-Year Incidence and Associations of DSM-IV Mood Disorders and Sociodemographic Characteristics.

Characteristic	Major Depressive Disorder			Bipolar I		Bipolar II	
	% (SE) ^a	OR ^b (99% CI) ^c	% (SE)	OR (99% CI)	% (SE)	OR (99% CI)	
Sex							
Men	1.0 (0.10)	0.5 (0.37–0.76)	0.5 (0.06)	0.8 (0.49–1.26)	0.1 (0.03)	0.4 (0.17–1.01)	
Women	2.0 (0.14)	1.0	0.6 (0.06)	1.0	0.3 (0.05)	1.0	
Age, y							
20–29	1.9 (0.26)	2.0 (1.19–3.41)	0.9 (0.15)	4.0 (1.69–9.56)	0.3 (0.09)	4.9 (1.46–16.19)	
30–54	1.6 (0.12)	1.7 (1.22–2.47)	0.6 (0.07)	3.0 (1.38–6.57)	0.3 (0.05)	4.2 (1.19–14.64)	
55+	1.2 (0.11)	1.0	0.2 (0.05)	1.0	0.1 (0.03)	1.0	
Race-ethnicity							
White	1.4 (0.10)	1.0	0.4 (0.05)	1.0	0.2 (0.04)	1.0	
Black	1.4 (0.16)	0.7 (0.49–1.04)	1.0 (0.15)	1.6 (0.91–2.86)	0.3 (0.06)	0.9 (0.34–2.30)	
Hispanic	2.3 (0.29)	1.4 (0.95–2.15)	0.7 (0.16)	0.9 (0.41–2.07)	0.2 (0.05)	0.6 (0.19–1.91)	
Family income, \$							
0–19,999	2.5 (0.26)	2.1 (1.14–3.73)	0.8 (0.13)	1.8 (0.73–4.53)	0.3 (0.07)	2.9 (0.69–12.30)	
20,000–34,999	1.6 (0.19)	1.5 (0.85–2.52)	0.8 (0.13)	1.9 (0.79–4.58)	0.5 (0.13)	4.7 (1.00–22.36)	
35,000–69,999	1.4 (0.14)	1.4 (0.84–2.34)	0.4 (0.07)	1.0 (0.46–2.13)	0.1 (0.04)	1.0 (0.25–4.10)	
70,000+	0.9 (0.14)	1.0	0.4 (0.07)	1.0	0.1 (0.04)	1.0	
Marital status							
Married/cohabiting	1.1 (0.10)	1.0	0.5 (0.05)	1.0	0.2 (0.04)	1.0	
Separated/divorced/widowed	2.8 (0.26)	2.2 (1.44–3.48)	0.5 (0.07)	0.9 (0.51–1.62)	0.3 (0.07)	1.3 (0.42–4.20)	
Never married	1.7 (0.21)	1.2 (0.76–1.86)	0.9 (0.14)	1.2 (0.61–2.24)	0.3 (0.08)	0.9 (0.35–2.49)	
Education							
Less than high school	1.7 (0.23)	0.9 (0.58–1.45)	0.9 (0.16)	2.2 (1.08–4.41)	0.2 (0.07)	1.2 (0.38–3.56)	
High school	1.7 (0.16)	1.1 (0.80–1.64)	0.6 (0.09)	1.5 (0.82–2.61)	0.3 (0.08)	1.4 (0.50–3.89)	
Some college or beyond	1.4 (0.11)	1.0	0.4 (0.05)	1.0	0.2 (0.04)	1.0	
Urbanicity							
Urban	1.5 (0.09)	1.1 (0.69–1.77)	0.5 (0.05)	0.6 (0.33–1.01)	0.2 (0.04)	1.0 (0.35–2.67)	
Rural	1.4 (0.22)	1.0	0.8 (0.14)	1.0	0.2 (0.07)	1.0	
Region							
Northeast	1.3 (0.19)	0.9 (0.54–1.42)	0.6 (0.10)	0.9 (0.47–1.64)	0.1 (0.05)	0.7 (0.21–2.01)	
Midwest	1.8 (0.20)	1.2 (0.79–1.73)	0.4 (0.09)	0.5 (0.25–1.17)	0.2 (0.06)	0.8 (0.26–2.42)	
South	1.4 (0.13)	0.9 (0.63–1.28)	0.5 (0.07)	0.7 (0.41–1.29)	0.2 (0.07)	1.1 (0.34–3.22)	
West	1.6 (0.16)	1.0	0.6 (0.10)	1.0	0.2 (0.06)	1.0	

Note: Figures in boldface are significant at $p < 0.01$.^aSE = standard error.^bOR = odds ratio.^cCI = 99% confidence interval.

Table 4
 One-Year Incidence and Associations of DSM-IV Anxiety Disorders and Sociodemographic Characteristics

Characteristic	Panic Disorder		Social Phobia		Specific Phobia		Generalized Anxiety	
	% (SE) ^a	OR ^b (99% CI) ^c	% (SE)	OR (99% CI)	% (SE)	OR (99% CI)	% (SE)	OR (99% CI)
Sex								
Men	0.4 (0.06)	0.5 (0.28–0.80)	0.3 (0.05)	0.8 (0.42–1.57)	0.3 (0.06)	0.6 (0.32–0.99)	0.7 (0.08)	0.5 (0.34–0.72)
Women	0.8 (0.08)	1.0	0.4 (0.05)	1.0	0.6 (0.07)	1.0	1.5 (0.12)	1.0
Age, y								
20–29	0.8 (0.14)	2.7 (1.21–6.09)	0.6 (0.12)	5.1 (1.52–16.79)	0.5 (0.13)	1.9 (0.69–5.34)	1.1 (0.18)	1.9 (0.97–3.74)
30–54	0.7 (0.08)	2.6 (1.31–5.19)	0.4 (0.06)	4.0 (1.58–10.22)	0.6 (0.08)	3.1 (1.50–6.47)	1.5 (0.12)	2.9 (1.80–4.81)
55+	0.4 (0.07)	1.0	0.1 (0.04)	1.0	0.2 (0.04)	1.0	0.7 (0.09)	1.0
Race-ethnicity								
White	0.6 (0.06)	1.0	0.3 (0.05)	1.0	0.4 (0.06)	1.0	1.2 (0.09)	1.0
Black	0.6 (0.10)	0.8 (0.47–1.39)	0.3 (0.08)	0.8 (0.35–1.66)	0.6 (0.10)	1.1 (0.58–2.10)	1.2 (0.17)	0.8 (0.52–1.18)
Hispanic	0.7 (0.15)	0.9 (0.44–1.69)	0.4 (0.08)	0.8 (0.37–1.78)	0.5 (0.14)	1.0 (0.46–2.31)	0.7 (0.13)	0.5 (0.27–0.91)
Family income, \$								
0–19,999	1.0 (0.13)	2.3 (1.12–4.67)	0.6 (0.12)	5.5 (2.08–14.71)	0.5 (0.10)	1.2 (0.51–2.93)	1.6 (0.17)	2.1 (1.15–3.85)
20,000–34,999	0.6 (0.10)	1.2 (0.58–2.60)	0.2 (0.06)	1.7 (0.60–4.92)	0.3 (0.10)	0.7 (0.25–2.08)	1.1 (0.17)	1.5 (0.83–2.69)
35,000–69,999	0.5 (0.09)	1.2 (0.58–2.27)	0.4 (0.07)	2.6 (0.95–6.83)	0.5 (0.09)	1.2 (0.57–2.56)	1.0 (0.11)	1.2 (0.76–1.96)
70,000+	0.5 (0.08)	1.0	0.2 (0.04)	1.0	0.4 (0.08)	1.0	0.9 (0.13)	1.0
Marital status								
Married/cohabiting	0.6 (0.07)	1.0	0.3 (0.05)	1.0	0.4 (0.06)	1.0	0.9 (0.09)	1.0
Separated/divorced/widowed	0.6 (0.11)	0.9 (0.49–1.69)	0.4 (0.08)	1.3 (0.65–2.74)	0.4 (0.08)	1.2 (0.57–2.54)	1.6 (0.18)	1.6 (1.02–2.42)
Never married	0.8 (0.12)	0.9 (0.48–1.75)	0.5 (0.10)	0.9 (0.41–2.06)	0.7 (0.15)	1.9 (0.88–4.04)	1.4 (0.20)	1.3 (0.76–2.08)
Education								
Less than high school	0.9 (0.15)	1.5 (0.78–2.74)	0.3 (0.10)	0.8 (0.29–2.31)	0.6 (0.17)	1.5 (0.59–3.74)	1.2 (0.22)	1.0 (0.53–1.81)
High school	0.5 (0.07)	0.8 (0.49–1.45)	0.3 (0.06)	0.8 (0.39–1.60)	0.4 (0.08)	0.9 (0.43–1.76)	0.8 (0.11)	0.6 (0.41–1.01)
Some college or beyond	0.6 (0.07)	1.0	0.3 (0.05)	1.0	0.5 (0.06)	1.0	1.2 (0.10)	1.0
Urbanicity								
Urban	0.7 (0.06)	1.5 (0.81–2.73)	0.3 (0.04)	0.8 (0.41–1.54)	0.5 (0.05)	1.3 (0.62–2.71)	1.2 (0.08)	1.4 (0.86–2.22)
Rural	0.5 (0.09)	1.0	0.4 (0.09)	1.0	0.4 (0.09)	1.0	0.9 (0.15)	1.0
Region								
Northeast	0.6 (0.11)	1.1 (0.56–2.08)	0.2 (0.06)	0.7 (0.26–1.99)	0.4 (0.10)	1.1 (0.46–2.74)	1.0 (0.16)	0.9 (0.54–1.58)
Midwest	0.6 (0.12)	1.1 (0.58–2.07)	0.4 (0.09)	1.1 (0.40–2.81)	0.4 (0.09)	0.9 (0.39–2.22)	1.0 (0.15)	1.0 (0.57–1.66)
South	0.7 (0.10)	1.2 (0.61–2.18)	0.3 (0.06)	1.0 (0.42–2.36)	0.5 (0.08)	1.4 (0.68–2.86)	1.2 (0.13)	1.1 (0.75–1.72)
West	0.6 (0.10)	1.0	0.3 (0.08)	1.0	0.4 (0.09)	1.0	1.1 (0.13)	1.0

Note: Figures in boldface are significant at $p < 0.01$.

^a SE = standard error.

^b OR = odds ratio.

^c CI = 99% confidence interval.

Table 5
Associations of 1-Year Incidence of DSM-IV Substance Use Disorders by Specific Psychiatric Disorders at Baseline, Controlling for Sociodemographic Characteristics and Other Baseline Psychiatric Disorders.

Disorder Present at Baseline	Controlling for Sociodemographic Characteristics			Controlling for Sociodemographic Characteristics and Other Psychiatric Disorders		
	Alcohol Abuse OR ^a (99% CI) ^b	Alcohol Dependence OR (99% CI)	Any Drug Abuse OR (99% CI)	Alcohol Abuse OR (99% CI)	Alcohol Dependence OR (99% CI)	Any Drug Abuse OR (99% CI)
Alcohol use disorder						
Alcohol abuse		4.5 (3.15–6.55)	3.4 (1.56–7.29)		3.9 (2.61–5.71)	1.7 (0.68–4.23)
Alcohol dependence			5.3 (2.51–11.41)	3.4 (1.58–7.41)		2.9 (1.15–7.43)
Any drug use disorder						
Any drug abuse		2.9 (1.99–4.14)				
Any drug dependence		2.7 (1.22–6.14)				
Mood disorder						
Major depressive disorder		1.6 (1.09–2.33)	2.2 (0.96–5.15)			
Bipolar I		2.4 (1.38–4.15)	5.7 (2.31–14.26)			
Bipolar II		2.0 (0.85–4.63)	1.8 (0.35–9.23)			
Dysthymia		1.2 (0.57–2.40)	2.9 (0.76–10.99)			
Anxiety disorder						
Panic disorder		1.7 (0.95–2.88)	4.3 (1.62–11.57)			
Social phobia		1.6 (0.96–2.58)	1.9 (0.60–6.04)			
Specific phobia		1.5 (1.01–2.19)	2.3 (1.08–5.05)			
Generalized anxiety disorder		2.0 (1.14–3.53)	3.7 (1.29–10.65)			
Posttraumatic stress disorder		1.8 (1.14–2.94)	4.5 (1.64–12.26)			
Attention-deficit/hyperactivity disorder		2.2 (1.13–4.24)	5.4 (1.79–16.27)			
Personality disorder						
Paranoid		1.9 (1.07–3.35)	1.8 (0.48–6.86)			
Schizoid		1.4 (0.63–2.88)	2.2 (0.53–8.64)			
Schizotypal		2.5 (1.47–4.17)	8.0 (3.36–18.81)			
Antisocial		1.5 (0.51–4.36)	3.9 (1.37–11.33)			
Borderline		3.9 (2.62–5.84)	8.9 (4.04–19.61)			
Histrionic		2.3 (1.11–4.73)	3.1 (0.69–13.98)			
Narcissistic		1.8 (1.07–2.94)	4.8 (2.07–11.34)			
Avoidant		1.2 (0.37–3.63)	2.4 (0.47–12.29)			
Dependent		0.1 (0.01–2.06)				
Obsessive-compulsive		1.6 (0.96–2.60)	2.0 (0.73–5.21)			

Note: Figures in boldface are significant at $p < 0.01$.

^aOR = odds ratio.

^bCI = 99% confidence interval.

^cZero cell.

Table 6
Associations of 1-Year Incidence of DSM-IV Mood Disorders by Specific Psychiatric Disorders at Baseline, Controlling for Sociodemographic Characteristics and Other Baseline Psychiatric Disorders.

Disorder Present at Baseline	Controlling for Sociodemographic Characteristics				Controlling for Sociodemographic Characteristics and Other Psychiatric Disorders				
	Major Depressive Disorder OR ^a (99% CI)	Bipolar I Disorder OR (99% CI)	Bipolar II Disorder OR (99% CI)	Major Depressive Disorder OR (99% CI)	Bipolar I Disorder OR (99% CI)	Bipolar II Disorder OR (99% CI)	Major Depressive Disorder OR (99% CI)	Bipolar I Disorder OR (99% CI)	Bipolar II Disorder OR (99% CI)
Alcohol use disorder	1.2 (0.85–1.75)	1.5 (0.91–2.57)	0.5 (0.19–1.35)	1.1 (0.70–1.63)	0.8 (0.40–1.77)	0.4 (0.12–1.10)	0.8 (0.40–1.77)	0.4 (0.12–1.10)	0.4 (0.12–1.10)
Alcohol abuse	1.2 (0.71–1.91)	2.4 (1.39–4.16)	1.0 (0.34–2.73)	0.9 (0.48–1.83)	1.7 (0.72–4.04)	1.3 (0.38–4.14)	1.7 (0.72–4.04)	1.3 (0.38–4.14)	1.3 (0.38–4.14)
Any drug use disorder	1.3 (0.84–2.09)	1.6 (0.85–2.94)	0.6 (0.20–2.04)	1.2 (0.69–2.16)	1.0 (0.43–2.12)	0.7 (0.17–2.50)	1.0 (0.43–2.12)	0.7 (0.17–2.50)	0.7 (0.17–2.50)
Any drug abuse	1.2 (0.60–2.54)	1.8 (0.67–4.82)	0.5 (0.03–6.58)	0.9 (0.39–2.29)	0.7 (0.19–2.32)	0.4 (0.03–7.15)	0.7 (0.19–2.32)	0.4 (0.03–7.15)	0.4 (0.03–7.15)
Mood disorder	-----	1.6 (0.99–2.74)	3.2 (1.22–8.69)	-----	0.9 (0.50–1.53)	1.9 (0.64–5.55)	0.9 (0.50–1.53)	1.9 (0.64–5.55)	1.9 (0.64–5.55)
Major depressive disorder	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bipolar I	-----	1.7 (0.60–5.02)	-----	-----	0.7 (0.23–2.07)	-----	0.7 (0.23–2.07)	-----	-----
Bipolar II	-----	1.6 (0.59–4.29)	1.4 (0.30–6.94)	3.7 (1.78–7.81)	0.8 (0.28–2.29)	0.7 (0.15–3.16)	0.8 (0.28–2.29)	0.7 (0.15–3.16)	0.7 (0.15–3.16)
Dysthymia	4.7 (2.31–9.47)	-----	-----	-----	-----	-----	-----	-----	-----
Anxiety disorder	-----	-----	-----	-----	-----	-----	-----	-----	-----
Panic disorder	1.9 (1.18–3.16)	3.3 (1.63–6.79)	3.0 (1.02–9.01)	1.8 (1.01–3.08)	1.9 (0.80–4.51)	1.7 (0.48–5.82)	1.9 (0.80–4.51)	1.7 (0.48–5.82)	1.7 (0.48–5.82)
Social phobia	2.0 (1.21–3.19)	2.6 (1.22–5.44)	1.9 (0.63–5.48)	1.6 (0.91–2.69)	1.1 (0.50–2.42)	0.8 (0.26–2.43)	1.1 (0.50–2.42)	0.8 (0.26–2.43)	0.8 (0.26–2.43)
Specific phobia	2.0 (1.33–2.89)	1.9 (1.07–3.32)	1.7 (0.67–4.37)	1.6 (1.02–2.40)	1.0 (0.53–1.78)	0.9 (0.32–2.34)	1.0 (0.53–1.78)	0.9 (0.32–2.34)	0.9 (0.32–2.34)
Generalized anxiety disorder	2.2 (1.30–3.74)	3.1 (1.64–5.87)	5.0 (1.60–15.80)	2.2 (1.09–4.26)	1.5 (0.73–3.11)	2.9 (0.41–21.09)	1.5 (0.73–3.11)	2.9 (0.41–21.09)	2.9 (0.41–21.09)
Posttraumatic stress disorder	2.2 (1.50–3.12)	4.2 (2.58–6.95)	2.6 (1.01–7.04)	2.0 (1.30–2.99)	2.4 (1.33–4.31)	1.5 (0.50–4.62)	2.4 (1.33–4.31)	1.5 (0.50–4.62)	1.5 (0.50–4.62)
Attention-deficit/hyperactivity disorder	1.6 (0.69–3.68)	5.0 (2.26–10.97)	1.1 (0.24–5.14)	1.3 (0.52–3.28)	2.6 (1.14–6.10)	0.6 (0.12–2.94)	2.6 (1.14–6.10)	0.6 (0.12–2.94)	0.6 (0.12–2.94)
Personality disorder	-----	-----	-----	-----	-----	-----	-----	-----	-----
Paranoid	0.4 (0.20–0.91)	2.7 (1.34–5.46)	1.7 (0.45–6.62)	0.3 (0.14–0.72)	1.0 (0.49–2.21)	0.7 (0.18–2.84)	1.0 (0.49–2.21)	0.7 (0.18–2.84)	0.7 (0.18–2.84)
Schizoid	0.8 (0.34–2.04)	2.3 (0.88–5.89)	0.6 (0.15–2.86)	0.7 (0.27–1.64)	0.9 (0.35–2.57)	0.3 (0.06–1.29)	0.9 (0.35–2.57)	0.3 (0.06–1.29)	0.3 (0.06–1.29)
Schizotypal	2.6 (1.54–4.27)	5.2 (2.91–9.23)	4.3 (1.48–12.35)	2.1 (1.17–3.86)	2.0 (1.04–3.71)	1.8 (0.59–5.48)	2.0 (1.04–3.71)	1.8 (0.59–5.48)	1.8 (0.59–5.48)
Antisocial	0.6 (0.25–1.68)	2.6 (1.12–6.07)	2.4 (0.66–8.96)	0.5 (0.18–1.36)	1.2 (0.49–2.82)	2.2 (0.50–9.90)	1.2 (0.49–2.82)	2.2 (0.50–9.90)	2.2 (0.50–9.90)
Borderline	3.6 (2.41–5.39)	8.4 (5.20–13.68)	4.9 (1.97–12.24)	4.4 (2.74–7.10)	4.2 (2.26–7.72)	3.0 (0.90–10.15)	4.2 (2.26–7.72)	3.0 (0.90–10.15)	3.0 (0.90–10.15)
Histrionic	0.4 (0.07–2.40)	3.4 (1.19–9.62)	1.5 (0.22–10.74)	0.3 (0.05–1.68)	1.2 (0.40–3.44)	0.7 (0.10–5.32)	1.2 (0.40–3.44)	0.7 (0.10–5.32)	0.7 (0.10–5.32)
Narcissistic	1.8 (1.20–2.78)	7.1 (4.24–12.00)	3.9 (1.42–10.77)	1.4 (0.88–2.13)	3.7 (2.05–6.68)	2.0 (0.72–5.32)	3.7 (2.05–6.68)	2.0 (0.72–5.32)	2.0 (0.72–5.32)
Avoidant	0.8 (0.25–2.42)	2.1 (0.65–6.84)	2.6 (0.46–14.34)	0.7 (0.20–2.24)	0.8 (0.23–2.57)	1.0 (0.19–5.15)	0.8 (0.23–2.57)	1.0 (0.19–5.15)	1.0 (0.19–5.15)
Dependent	0.3 (0.02–3.96)	2.3 (0.15–35.13)	----- ^c	0.3 (0.02–4.15)	0.9 (0.05–13.51)	----- ^c	0.9 (0.05–13.51)	----- ^c	----- ^c
Obsessive-compulsive	1.0 (0.55–1.78)	2.2 (1.10–4.56)	3.5 (1.34–9.22)	0.8 (0.42–1.38)	1.0 (0.47–2.25)	1.8 (0.66–4.77)	1.0 (0.47–2.25)	1.8 (0.66–4.77)	1.8 (0.66–4.77)

Note: Figures in boldface are significant at $p < 0.01$.

^aOR = odds ratio.

^bCI = 99% confidence interval.

^cZero cell.

Table 7
Associations and 1-Year Incidence of DSM-IV Anxiety Disorders by Specific Psychiatric Disorders at Baseline, Controlling for Sociodemographic Characteristics and Other Baseline Psychiatric Disorders.

Disorder Present at Baseline	Controlling for Sociodemographic Characteristics				Controlling for Sociodemographic Characteristics and Other Psychiatric Disorders			
	Panic Disorder OR ^a (99% CI) ^b	Social Phobia OR (99% CI)	Specific Phobia OR (99% CI)	Generalized Anxiety Disorder OR (99% CI)	Panic Disorder OR (99% CI)	Social Phobia OR (99% CI)	Specific Phobia OR (99% CI)	Generalized Anxiety Disorder OR (99% CI)
Alcohol use disorder								
Alcohol abuse	1.5 (0.89–2.66)	1.3 (0.56–3.03)	1.2 (0.62–2.19)	1.9 (1.24–2.80)	1.0 (0.52–1.80)	0.6 (0.22–1.83)	0.9 (0.42–1.94)	1.2 (0.75–1.99)
Alcohol dependence	2.1 (1.23–3.73)	2.1 (1.01–4.52)	1.6 (0.76–3.51)	2.3 (1.49–3.71)	1.3 (0.67–2.54)	1.5 (0.57–4.00)	1.4 (0.56–3.60)	1.2 (0.66–2.13)
Any drug use disorder								
Any drug abuse	1.9 (1.06–3.47)	2.2 (0.93–5.26)	1.1 (0.40–2.87)	1.8 (1.11–2.78)	1.1 (0.55–2.28)	1.7 (0.68–4.39)	0.8 (0.23–2.62)	0.9 (0.49–1.58)
Any drug dependence	2.5 (0.95–6.40)	1.0 (0.25–3.95)	1.2 (0.25–5.76)	2.3 (1.20–4.35)	1.0 (0.33–2.99)	0.3 (0.05–1.25)	0.7 (0.14–4.06)	0.9 (0.40–1.94)
Mood disorder								
Major depressive disorder	2.6 (1.58–4.18)	2.6 (1.23–5.45)	1.4 (0.73–2.79)	3.1 (2.11–4.55)	1.7 (0.98–2.84)	1.5 (0.71–2.99)	0.9 (0.47–1.88)	1.9 (1.30–2.91)
Bipolar I	3.6 (1.88–6.75)	3.8 (1.70–8.63)	2.0 (0.57–7.04)	4.5 (2.72–7.48)	2.3 (1.09–4.98)	1.9 (0.76–4.78)	1.1 (0.21–5.38)	2.6 (1.45–4.49)
Bipolar II	2.9 (1.08–7.62)	3.5 (1.12–11.00)	2.0 (0.48–8.58)	2.3 (1.01–5.25)	2.1 (0.75–5.70)	2.1 (0.67–6.58)	1.2 (0.26–5.84)	1.6 (0.68–3.74)
Dysthymia	3.5 (1.75–6.90)	4.9 (1.95–12.14)	1.7 (0.53–5.29)	3.5 (2.02–6.03)	1.7 (0.79–3.50)	2.1 (0.76–5.74)	1.1 (0.33–3.29)	1.6 (0.91–2.83)
Anxiety disorder								
Panic disorder	-----	6.2 (2.98–12.97)	4.7 (2.33–9.47)	3.7 (2.31–5.78)	-----	2.8 (1.26–6.18)	3.6 (1.48–8.62)	1.7 (1.04–2.93)
Social phobia	2.9 (1.43–5.73)	-----	1.9 (0.84–4.35)	4.1 (2.57–6.68)	1.3 (0.66–2.74)	-----	1.1 (0.46–2.86)	1.8 (1.01–3.17)
Specific phobia	1.8 (1.06–2.97)	3.4 (1.85–6.13)	-----	2.2 (1.52–3.20)	1.0 (0.57–1.73)	1.8 (0.92–3.58)	-----	1.1 (0.76–1.72)
Generalized anxiety disorder	5.2 (2.80–9.54)	4.5 (2.29–8.72)	1.4 (0.56–3.70)	-----	2.6 (1.25–5.41)	1.6 (0.72–3.66)	0.8 (0.27–2.14)	-----
Posttraumatic stress disorder	4.4 (2.62–7.28)	4.4 (2.04–9.54)	3.6 (1.81–7.18)	3.1 (2.06–4.61)	2.6 (1.48–4.49)	2.0 (0.91–4.50)	2.7 (1.25–5.66)	1.5 (0.95–2.37)
Attention-deficit/hyperactivity disorder	3.0 (1.07–8.49)	1.9 (0.71–5.37)	3.1 (0.63–15.16)	4.2 (2.04–8.77)	1.5 (0.50–4.58)	0.8 (0.28–2.24)	2.0 (0.36–10.82)	1.9 (0.89–3.94)
Personality disorder								
Paranoid	2.3 (1.07–4.99)	2.2 (0.71–6.79)	0.8 (0.30–2.21)	2.7 (1.48–4.88)	1.0 (0.43–2.15)	0.7 (0.21–2.24)	0.4 (0.15–1.19)	0.9 (0.49–1.66)
Schizoid	1.8 (0.60–5.29)	1.7 (0.43–6.47)	1.1 (0.21–6.19)	1.8 (0.80–4.07)	0.8 (0.26–2.24)	0.6 (0.14–2.29)	0.6 (0.11–3.73)	0.7 (0.28–1.54)
Schizotypal	5.1 (2.72–9.56)	7.2 (3.86–13.54)	4.5 (1.80–11.29)	6.4 (4.01–10.22)	2.6 (1.30–5.15)	2.8 (1.26–6.13)	2.9 (0.97–8.43)	2.6 (1.54–4.45)
Antisocial	1.1 (0.34–3.38)	0.9 (0.16–4.67)	0.8 (0.18–3.41)	2.0 (0.84–4.77)	0.5 (0.15–1.60)	0.3 (0.06–1.98)	0.5 (0.10–2.35)	0.8 (0.32–2.10)
Borderline	4.7 (2.71–8.18)	8.2 (4.65–14.38)	4.1 (2.01–8.22)	9.9 (6.58–14.78)	2.3 (1.13–4.52)	3.6 (1.51–8.49)	2.7 (1.07–7.01)	4.7 (2.94–7.60)
Histrionic	1.8 (0.62–5.05)	3.4 (0.70–16.82)	1.7 (0.25–11.31)	0.7 (0.24–2.06)	0.7 (0.25–2.14)	1.2 (0.23–6.76)	0.9 (0.14–5.70)	0.2 (0.07–0.65)
Narcissistic	2.0 (0.94–4.10)	3.1 (1.56–6.12)	3.0 (1.43–6.08)	4.7 (3.15–7.08)	1.0 (0.48–2.26)	1.3 (0.62–2.71)	2.0 (0.99–4.04)	2.3 (1.51–3.60)
Avoidant	0.9 (0.31–2.93)	3.6 (0.81–16.03)	0.2 (0.01–2.47)	2.9 (1.20–7.10)	0.3 (0.10–1.10)	1.2 (0.27–5.19)	0.1 (0.01–1.19)	0.9 (0.38–2.24)
Dependent	2.7 (0.35–20.70)	4.6 (0.50–42.52)	0.7 (0.04–10.76)	1.4 (0.10–21.53)	1.0 (0.12–7.94)	1.2 (0.12–11.18)	0.3 (0.02–4.88)	0.4 (0.03–6.20)
Obsessive-compulsive	2.2 (1.14–4.39)	1.9 (0.72–5.14)	0.8 (0.29–1.96)	2.0 (1.25–3.31)	1.1 (0.59–2.17)	0.7 (0.27–2.02)	0.4 (0.15–1.16)	0.8 (0.50–1.33)

Note: Figures in boldface are significant at $p < 0.01$.

^aOR = odds ratio.

^bCI = confidence interval.