Epidemiology of Major Depressive Disorder

Results From the National Epidemiologic Survey on Alcoholism and Related Conditions

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Objective: To present nationally representative data on 12-month and lifetime prevalence, correlates, and co-morbidity of DSM-IV major depressive disorder (MDD) among adults in the United States.

Design/Setting/Participants: Face-to-face survey of more than 43,000 adults aged 18 years and older residing in households and group quarters in the United States.

Main Outcome Measures: Prevalence and associations of MDD with sociodemographic correlates and Axis I and II disorders.

Results: The prevalence of 12-month and lifetime DSM-IV MDD was 5.28% (95% confidence interval, 4.98-5.57) and 13.23% (95% confidence interval, 12.64-13.81), respectively. Being female; Native American; middle-aged; widowed, separated, or divorced; and low income increased risk, and being Asian, Hispanic, or black decreased risk (P<.05). Women were significantly more likely to receive treatment than men. Both current and lifetime MDD were significantly associated with other specific psychiatric disorders, notably substance dependence, panic and generalized anxiety disorder, and several personality disorders.

Conclusions: This large survey suggests a higher prevalence of MDD in the US population than large-sample estimates from the 1980s and 1990s. The shift in highest lifetime risk from young to middle-aged adults is an important transformation in the distribution of MDD in the United States and specificity in risk for an age-period cohort. Associations between MDD and Axis I and II disorders were strong and significant, with variation within broad categories by specific diagnoses signaling the need for attention to the genetic and environmental reasons for such variation, as well as the implications for treatment response.

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Thus far, NCS-R comorbidity of MDD was reported only
for broad categories, not specific disorders.

Worldwide, several epidemiologic surveys of MDD (as
distinct from major depressive episode) have been
conducted since about 1980. For DSM-IV, lifetime and 12-
month rates of DSM-IV MDD in Germany were 17.1% and
10.7%. For DSM-III-R criteria, MDD prevalence in the
Netherlands, Norway, Italy, and Hungary ranged from
15.1% to 17.8% for lifetime and 5.8% to 7.3% for the last
12 months. For DSM-III criteria, lifetime prevalence ranged
from 1.5% to 19.0% (mean, 8.8%; median, 8.9%) while
12-month MDD prevalence ranged from 0.8% to 5.8%
(mean, 3.4%; median, 3.0%) across 11 countries world-
wide. These surveys indicate that MDD prevalence was
higher with DSM-IV and DSM-III-R than DSM-III criteria,
although whether due to criteria differences or true preva-
ience is unknown. However, although DSM-IV was pub-
lished 10 years ago, only 2 national studies have ad-
dressed the epidemiology of MDD according to DSM-IV
criteria. Although the World Health Organization World
Mental Health 2000 Survey was based on DSM-IV cri-
teria, rates for MDD have not yet been reported.

The earlier studies all contributed valuable information,
but they leave important questions unanswered about
the current US epidemiology of DSM-IV MDD and its com-
orbidity with other disorders. First, given the diver-
sity of the US population, disparities in disadvantaged
groups, and the aging of the population (particularly
the “baby boom”), delineating the prevalence of MDD in spe-
cific US demographic groups (ie, age and race-ethnic
groups) is necessary. This requires larger samples than
most previous surveys (usually ≤5000). Second, obtain-
ing accurate information on MDD comorbidity with other
specific mental disorders is important because etiology
and treatment implications of specific disorders within
broader categories may differ considerably. Assessing co-
orbidity on a disorder-specific basis also requires larger
samples than in the past. Third, only 1 large national sur-
vey (Australia) assessed personality disorders (PDs) other
than antisocial personality disorder. Although ground-
breaking on this topic, the survey collected information
on PDs from the International Classification of Diseases,
10th Revision, and only reported the association of PDs
with the broad “any affective disorder” category. To
begin building a knowledge base on the co-occurrence
and implications of MDD with DSM-IV PDs, large-scale
survey data are critical.

The National Epidemiologic Survey of Alcoholism and
Related Conditions (NESARC) was conducted to ad-
dress these and related questions. The NESARC was large
enough (n = 43,093) to indicate the prevalence of DSM-IV
MDD in minority groups not studied previously on a na-
tional basis, as well as the comorbidity of DSM-IV MDD
with specific, often rare conditions, including PDs.

METHODS

SAMPLE

The 2001 through 2002 NESARC is a representative sample
of the United States (including Alaska and Hawaii) conducted
by the National Institute on Alcohol Abuse and Alcoholism (Bethesda,
Md), as described elsewhere. The NESARC target population
was the civilian, noninstitutionalized population residing in
households and group quarters, aged 18 years and older. Face-
to-face interviews were conducted with 43,093 respondents. The
survey response rate was 81%. Blacks, Hispanics, and young adults
(ages 18–24 years) were oversampled, with data adjusted for over-
sampling and household- and person-level nonresponse. The
weighted data were then adjusted to represent the US civilian
population based on the 2000 census.

DSM-IV DIAGNOSTIC INTERVIEW

The diagnostic interview used to generate diagnoses was the
Alcohol Use Disorder and Associated Disabilities Interview
Schedule–DSM-IV Version (AUDADIS-IV) from the National
Institute on Alcohol Abuse and Alcoholism. This structured
diagnostic interview designed for lay interviewers was de-
veloped to advance measurement of substance use and mental
disorders in large-scale surveys. Earlier AUDADIS-IV results on
major depression are reported elsewhere.

MAJOR DEPRESSIVE AND ANXIETY DISORDERS

A major depressive episode was diagnosed when at least 2 weeks
of persistent depressed mood or anhedonia were present, accom-
panied by a total of at least 3 or more of the 9 DSM-IV symptoms
of major depression during the episode. Lifetime DSM-IV MDD
was defined as having at least 1 major depressive episode over
the life course without history of manic, mixed, or hypomanic
episodes (ie, excluding bipolar 1 and bipolar 2 disorders). Among
respondents with lifetime MDD thus defined, respondents with
at least 1 major depressive episode in the year preceding the in-
terview were classified with 12-month MDD. Anxiety disorders
similarly followed DSM-IV criteria. The AUDADIS-IV MDD symp-
tom questions are similar to those of other measures, including
the Schedule for Affective Disorders and Schizophrenia and the
Structured Clinical Interview for DSM-III-R.

The DSM-IV includes a clinical significance criterion (CSC):
“symptoms cause clinically significant distress or impairment
in social, occupational or other important areas of function-
ing.” This important criterion has been assessed defi-
ciently in previous epidemiologic studies of MDD. The Diagnostic
Interview Schedule (DIS) used in the ECA and University of
Michigan–Composite International Diagnostic Interview
(UM-CIDI), used in the NCS predated DSM-IV and did not
assess the CSC at all. Reanalysis of ECA and NCS data attempted
to approximate the CSC with a single-item assessment of
social and occupational dysfunction and treatment as a proxy for
distress. For this proxy to be valid, however, services must be
universally available, broadly acceptable, and known to be efficacious, conditions not met in the US popu-
lation. This CSC approximation precludes separate analysis of
unmet treatment need. Unlike the AUDADIS-IV, the exten-
sively revised UM-CIDI, the World Mental Health CIDI
(WMHI-CIDI), used in the NCS-R and 2000 World Mental Health
Surveys, skips respondents not reporting significant distress
during 2 weeks of low mood or anhedonia out of the de-
pression section without asking about symptoms frequently re-
ponsible for distress (eg, insomnia). The AUDADIS-IV corrects
these problems by carefully defining the CSC according to
the DSM-IV definition of distress (2 questions) and/or impair-
ment (6 questions). The AUDADIS-IV asks these with refer-
ce to full syndromes after they are established, and ques-
tions are tailored to distinctive characteristics and impairments
of each disorder. Although designed as a binary CSC indica-
tor, the 8 items have good internal consistency (Cronbach α = .71). Among the 595 NESARC respondents whose worst epi-
sode was in last 12 months, the correlation between number of depressive symptoms and the impairment scale was 0.50 (P<.001), indicating a strong but not redundant relationship between symptom and impairment severity.

The MDD and anxiety diagnoses in this report are DSM-IV primary (or independent) diagnoses. In DSM-IV, “primary” excludes mental disorders that are substance-induced or due to a medical condition.30,31 In differentiating primary from substance-induced disorders, the DIS, UM-CIDI, and WMH-CIDI rely on respondent opinion of the cause of individual symptoms. An important AUDADIS improvement in this differentiation is use of specific questions about the chronological relationship between intoxication or withdrawal and the full depressive syndrome.32 Specific questions about chronology improve the reliability and validity of MDD diagnoses in substance abusers.33-35 The DIS, UM-CIDI, and WMH-CIDI also relied on respondent opinion in differentiating primary disorders from those due to a medical condition. The AUDADIS-IV offers a similar improvement: specific questions about chronology of the mental disorder and the medical condition. Diagnoses of MDD presented in this report also ruled out bereavement.

**SUBSTANCE USE DISORDERS**

The questions of AUDADIS-IV operationalize DSM-IV criteria for alcohol and drug-specific abuse and dependence for 10 drug classes (aggregated in this report).36 Consistent with the DSM-IV, lifetime AUDADIS-IV diagnoses of alcohol abuse required at least 1 of the 4 criteria for abuse either in the 12-month period preceding the interview or previously. The AUDADIS-IV alcohol dependence diagnoses required at least 3 of the 7 DSM-IV criteria for dependence during the past year or prior. For prior diagnoses of alcohol dependence, at least 3 criteria must have occurred within a 1-year period, following DSM-IV. Drug abuse and dependence and nicotine dependence37 diagnoses used the same algorithms.

The AUDADIS-IV substance use disorder diagnoses constitute substantial improvement over the DIS, UM-CIDI, and WMH-CIDI. The AUDADIS-IV dependence diagnoses are syndromal, requiring clustering of at least 3 dependence criteria in any 1 year over the lifetime. This contrasts with the DIS and UM-CIDI, which diagnose even individuals who never experienced more than 1 symptom at a time. With the AUDADIS-IV, last 12-month and lifetime prevalences clearly indicate those meeting full criteria for the diagnosis. The UM-CIDI and WHM-CIDI also did not provide alcohol or drug-specific abuse or dependence diagnoses unless problems were reported for 1 substance only.38-40 The WHM-CIDI used abuse symptoms to screen for dependence; those with no abuse symptoms were skipped past dependence questions. This procedure misses about one third of current dependence cases (mainly women and minority groups).53 Underestimating rates of alcohol and drug dependence and limiting inferences about comorbidity between substance and mood disorders, including MDD.

**PERSONALITY DISORDERS**

The AUDADIS-IV assessments of DSM-IV PDs have been presented previously.41-43 They include avoidant, dependent, obsessive-compulsive, paranoid, schizoid, and antisocial PDs. The DSM-IV PD diagnoses require evaluating long-term patterns of functioning. The AUDADIS-IV PD diagnoses were made accordingly. With the exception of antisocial PD, respondents were asked a series of 64 PD symptom questions about how they felt or acted most of the time, throughout their lives, regardless of the situation or whom they were with. Respondents were instructed not to include symptoms occurring only when they were depressed, manic, anxious, drinking heavily, using medi-
(95% confidence interval, 4.98-5.57), respectively (Table 1). (Bipolar disorders exclude MDD, so NESARC rates are presented as well: bipolar 1 lifetime and 12-month prevalences were 3.3% and 2.0%, and bipolar 2 lifetime and 12-month rates were 1.1% and 0.8%.) For both periods, higher rates of MDD were found among women; Native Americans; respondents who were middle-aged or widowed, separated, or divorced; and those with lower income levels.

When the lifetime risk of MDD was examined across sociodemographic population subgroups (Table 2), women showed a significantly higher risk (OR, 2.0). Among race-ethnic groups, the odds of MDD were significantly higher among Native Americans (OR, 1.5) and significantly lower among Asians (OR, 0.6), Hispanics (OR, 0.6), and blacks (OR, 0.7) compared with whites. Compared with the oldest age group, MDD risk was significantly greater for other groups, with strongest risk among those 45 to 64 years old. Risk of MDD was significantly greater among widowed, separated, or divorced respondents (OR, 2.2) than among those married or cohabiting. For each successively lower category of income, risk of MDD weakly increased, although only the lowest category (<$19,999/y) differed significantly from the highest category (OR, 1.7). Risk of MDD did not differ by education, region, or urbanicity.

ONSET, COURSE, AND TREATMENT

Mean age at onset of MDD was 30.4 years (Table 3). The hazard for onset of MDD (Figure) increased sharply between ages 12 and 16 years and continued to increase, albeit more gradually, up to the early 40s, when it began to decline. Among respondents with lifetime MDD, a mean of 4.7 episodes was reported, with median duration of 24.3 weeks for the longest (or only) episode. Approximately 60% of those with MDD reported treatment specifically for the disorder; women were more likely to be treated than men. Approximately 9.6% reported a hospitalization. Mean age at first treatment, 33.5 years, indicated a 3-year lag between onset and first treatment. Nearly half wanted to die, over a third thought of

### Table 1. Prevalence of 12-Month and Lifetime DSM-IV Major Depressive Disorder by Sociodemographic Characteristics

<table>
<thead>
<tr>
<th>Sociodemographic Characteristic</th>
<th>12-Month MDD, % (SE)</th>
<th>Lifetime MDD, % (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>5.28 (0.15)</td>
<td>13.23 (0.3)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3.56 (0.17)</td>
<td>9.01 (0.27)</td>
</tr>
<tr>
<td>Female</td>
<td>6.87 (0.24)</td>
<td>17.10 (0.44)</td>
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<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
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<tr>
<td>White</td>
<td>5.53 (0.17)</td>
<td>14.58 (0.29)</td>
</tr>
<tr>
<td>Black</td>
<td>4.52 (0.32)</td>
<td>8.93 (0.48)</td>
</tr>
<tr>
<td>Native American</td>
<td>8.89 (1.23)</td>
<td>19.17 (1.75)</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>4.12 (0.72)</td>
<td>8.77 (0.98)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4.27 (0.44)</td>
<td>9.64 (0.57)</td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>6.39 (0.35)</td>
<td>12.02 (0.49)</td>
</tr>
<tr>
<td>30-44</td>
<td>5.52 (0.26)</td>
<td>14.03 (0.46)</td>
</tr>
<tr>
<td>45-64</td>
<td>5.62 (0.28)</td>
<td>15.91 (0.50)</td>
</tr>
<tr>
<td>≥65</td>
<td>2.69 (0.22)</td>
<td>8.19 (0.38)</td>
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<tr>
<td>Marital status</td>
<td></td>
<td></td>
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<tr>
<td>Married or living with someone as if married</td>
<td>4.19 (0.17)</td>
<td>12.07 (0.35)</td>
</tr>
<tr>
<td>Widowed, separated, or divorced</td>
<td>7.89 (0.37)</td>
<td>18.80 (0.54)</td>
</tr>
<tr>
<td>Never married</td>
<td>6.31 (0.33)</td>
<td>11.99 (0.43)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>5.66 (0.36)</td>
<td>11.32 (0.53)</td>
</tr>
<tr>
<td>High school</td>
<td>5.01 (0.24)</td>
<td>12.13 (0.41)</td>
</tr>
<tr>
<td>Some college or higher</td>
<td>5.32 (0.19)</td>
<td>14.35 (0.37)</td>
</tr>
<tr>
<td>Personal income, $</td>
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<tr>
<td>0-19,999</td>
<td>6.46 (0.25)</td>
<td>14.02 (0.42)</td>
</tr>
<tr>
<td>20,000-34,999</td>
<td>4.78 (0.28)</td>
<td>13.18 (0.54)</td>
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<tr>
<td>35,000-69,999</td>
<td>3.94 (0.24)</td>
<td>12.29 (0.47)</td>
</tr>
<tr>
<td>≥70,000</td>
<td>3.42 (0.41)</td>
<td>11.26 (0.72)</td>
</tr>
<tr>
<td>Urbanicity</td>
<td></td>
<td></td>
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<tr>
<td>Urban</td>
<td>5.19 (0.17)</td>
<td>12.99 (0.35)</td>
</tr>
<tr>
<td>Rural</td>
<td>5.65 (0.31)</td>
<td>14.19 (0.46)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>5.12 (0.29)</td>
<td>12.33 (0.63)</td>
</tr>
<tr>
<td>Midwest</td>
<td>5.48 (0.38)</td>
<td>14.08 (0.64)</td>
</tr>
<tr>
<td>South</td>
<td>5.31 (0.24)</td>
<td>12.51 (0.43)</td>
</tr>
<tr>
<td>West</td>
<td>5.17 (0.33)</td>
<td>14.28 (0.85)</td>
</tr>
</tbody>
</table>

Abbreviation: MDD, major depressive disorder.

### Table 2. Odds Ratios of DSM-IV Lifetime Major Depressive Disorder and Sociodemographic Characteristics

<table>
<thead>
<tr>
<th>Sociodemographic Characteristic</th>
<th>Major Depressive Disorder, Odds Ratio (Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>1.0</td>
</tr>
<tr>
<td>Male</td>
<td>1.0</td>
</tr>
<tr>
<td>Female</td>
<td>2.0 (1.8-2.4)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
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</tr>
<tr>
<td>White</td>
<td>1.0</td>
</tr>
<tr>
<td>Black</td>
<td>0.7 (0.6-0.8)</td>
</tr>
<tr>
<td>Native American</td>
<td>1.5 (1.2-2.1)</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>0.6 (0.4-0.9)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.6 (0.5-0.8)</td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>1.5 (1.3-1.8)</td>
</tr>
<tr>
<td>30-44</td>
<td>1.8 (1.6-2.0)</td>
</tr>
<tr>
<td>45-64</td>
<td>2.1 (1.9-2.4)</td>
</tr>
<tr>
<td>≥65</td>
<td>1.0</td>
</tr>
<tr>
<td>Marital status</td>
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</tr>
<tr>
<td>Married or living with someone as if married</td>
<td>1.0</td>
</tr>
<tr>
<td>Widowed, separated, or divorced</td>
<td>2.2 (1.9-2.6)</td>
</tr>
<tr>
<td>Never married</td>
<td>1.0 (0.8-1.1)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>1.1 (0.9-1.3)</td>
</tr>
<tr>
<td>High school</td>
<td>1.0 (0.8-1.1)</td>
</tr>
<tr>
<td>Some college or higher</td>
<td>1.0</td>
</tr>
<tr>
<td>Personal income, $</td>
<td></td>
</tr>
<tr>
<td>0-19,999</td>
<td>1.7 (1.2-2.6)</td>
</tr>
<tr>
<td>20,000-34,999</td>
<td>1.4 (0.9-2.1)</td>
</tr>
<tr>
<td>35,000-69,999</td>
<td>1.2 (0.8-1.7)</td>
</tr>
<tr>
<td>≥70,000</td>
<td>1.0</td>
</tr>
<tr>
<td>Urbanicity</td>
<td></td>
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<tr>
<td>Urban</td>
<td>1.0</td>
</tr>
<tr>
<td>Rural</td>
<td>0.9 (0.8-1.1)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>1.0 (0.8-1.2)</td>
</tr>
<tr>
<td>Midwest</td>
<td>1.0 (0.8-1.3)</td>
</tr>
<tr>
<td>South</td>
<td>0.8 (0.6-1.0)</td>
</tr>
<tr>
<td>West</td>
<td>1.0</td>
</tr>
</tbody>
</table>
suicide, and 8.8% reported a suicide attempt.

PREVALENCE OF DSM-IV AXIS I AND II DISORDERS AMONG RESPONDENTS WITH MDD

Table 4 shows the prevalence of other disorders among those with MDD by time frame. Among those with MDD in the prior 12 months, 14.1% had an alcohol use disorder, 4.6% had a drug use disorder, and 26.0% had nicotine dependence. Furthermore, 36.1% had at least 1 anxiety disorder, with specific prevalences ranging from 2.5% to 17.5%. The prevalence of any PD was also high (37.9%) and quite variable from PD to PD.

Among those with lifetime MDD, 40.3% had an alcohol use disorder, 17.2% had a drug use disorder, and 30.0% had nicotine dependence. Slightly over 40% had an anxiety disorder and slightly over 30% had a PD. Considerable variability also occurred in the lifetime prevalence of specific disorders within broad diagnostic categories (eg, anxiety, personality).

ASSOCIATION BETWEEN DSM-IV MDD AND OTHER PSYCHIATRIC DISORDERS

The 12-month and lifetime associations between MDD and other psychiatric disorders are shown in Table 5, including unadjusted ORs and ORs adjusted for socio-demographic factors. Major depressive disorder was significantly associated at varying levels with all other disorders. Odds ratios were generally greater for 12-month disorders than for lifetime disorders. Even after adjustment for important covariates, associations generally remained strong and statistically significant. We focus on adjusted results.

Major depressive disorder was more strongly related to dependence than abuse for alcohol and drug disorders, with strongest associations for drug dependence. Associations were similar for 12-month and lifetime disorders except for drug dependence, where the associ-
tion was stronger in the last 12 months (OR, 3.7) than for lifetime (OR, 2.5).

Anxiety disorders were strongly related to MDD regardless of time frame. The considerable variability in the ORs by specific anxiety disorder illustrates the importance of examining the disorders separately. In both time frames, specific phobia had the weakest association with MDD (ORs, 2.5 and 2.6); most other anxiety disorders showed ORs ranging from 4.0 to 5.4 in the last 12 months and 3.2 to 3.9 for lifetime. The exception was generalized anxiety disorder, with adjusted ORs of 8.6 and 5.7 in the last 12 months and lifetime, respectively.

With respect to any PD, the adjusted associations were large for 12-month and lifetime MDD. Avoidant (ORs, 4.2 and 3.5), dependent (ORs, 4.0 and 2.6), paranoid (ORs, 3.7 and 2.9), and schizoid (ORs, 3.7 and 3.2) PDs were more strongly related to MDD than other PDs.

These results indicate that in the United States in 2001 through 2002, 5.28% of adults experienced MDD in the prior 12 months and 13.2% experienced MDD during their lifetimes. The diagnosis was associated with significant impairment on a widely used functioning scale, and depression severity (number of symptoms) was highly correlated with impaired functioning. Average duration was almost 6 months longer than the previous estimate of 4 months. Almost half the respondents with MDD thought about suicide or wanted to die. Thus, MDD continues to present a serious personal and public health problem.

Lifetime rates (and odds) of MDD were higher among “baby boom” than younger (18- to 29-year-old) adults, in contrast to earlier surveys showing highest rates in the youngest cohorts. The findings suggest that the post-World War II increase in lifetime prevalence of major depression may be tapering off and may ultimately be a specific age-period effect rather than a permanent increase. Investigation of factors leading to this important change should clarify environmental or gene × environmental risks for MDD.

Because of its size, the NESARC provides more precise information on ethnic differences than any other source. The findings disclose higher risk for MDD among Native Americans. Information on diagnosed mental disorders among Native Americans is scarce, and attention to the mental health needs of this group appears warranted. Previous studies found blacks at lower risk than whites for lifetime MDD but the NESARC findings of lower risk for Hispanics and Asians contributes new information. The NESARC size, oversampling for Hispanics (20% of the sample), and cultural sensitivity of the survey provide highly accurate findings on Hispanics. Further analyses are needed to understand the protective factors in these groups. However, lower rates among disadvantaged minority groups do not diminish the importance of treating MDD when it occurs. Disparities in the treatment for MDD among minority groups are extensively documented, but little is known about whether...
comorbidity affects these disparities, an important topic for further investigation.

The results provide new, detailed information on the comorbidity of MDD and substance abuse and dependence, including a strong association of MDD with dependence on alcohol, drug, and nicotine, in contrast with a weak relationship of MDD with substance abuse. These results highlight the importance of not lumping abuse and dependence together when studying comorbidity and the utility of the DSM-IV system of diagnosing dependence, a disorder with a strong theoretical basis and abundant validity evidence.77 Further, MDD showed a stronger relationship to drug dependence than alcohol or nicotine, a difference that remains to be explained. The NESARC findings advance knowledge over the ECA, which used the DSM-III to diagnose substance use disorders, and over the NCS and NCS-R, limited by small samples and errors in diagnosing dependence.53

Substance disorders are a large public health problem,28,79 which is increasing in younger cohorts.80 Clarifying the links between MDD and DSM-IV substance use disorders has been an important goal. The NESARC results suggest focusing on dependence when studying the relationship of MDD to substance disorders. This is supported by the earlier finding of excess rates of MDD among 6050 long-abstinent former drinkers,81 refuting the belief that MDD among alcoholics is simply misdiagnosed withdrawal.81 Genetic studies are identifying factors underlying the comorbidity of alcohol dependence and MDD.6,7 Given the stronger association of MDD with drug dependence, investigation of the genetic and environmental factors for this relationship will be important.

The results on MDD and anxiety disorders showed the strongest relationships for disorders in the previous 12 months. The magnitude ranged from ORs of 2.5 for simple phobia to 8.6 for generalized anxiety disorder. Determining the reasons for this variation in magnitude is important. The information in this report can provide a starting point for such investigation.

Information on PDs among US adults was not previously available and is highly relevant to MDD, as indicated by clinical studies.82,86 All PDs assessed had strong associations with MDD, but magnitudes varied. The cluster B PDs (histrionic, antisocial) showed the lowest association with MDD. Cluster A PDs (paranoid, schizoid) showed intermediate associations. Cluster C PDs (avoidant, dependent) showed the strongest associations with MDD, except for obsessive-compulsive PD. Future studies will address these varying associations and their impact on adult MDD, work that will be enhanced when the remaining PDs assessed in wave 2 are included.

Limitations of this study include its cross-sectional nature; several of these issues may be better addressed longitudinally. Further, the risk for chronicity in 1 condition conferred by a second condition is usually studied in a clinical context.85 While such information is important to clinicians, it will be of considerable benefit to understand these relationships in a general population setting. Accordingly, wave 2 of the NESARC, a 3-year follow-up of the participants, is currently under way and will be followed by subsequent waves.

The NESARC bipolar rates were presented earlier in the article. Aside from the NESARC, no national survey data exist for DSM-IV bipolar disorders. Lifetime DSM-III bipolar 1 rates in 15 countries11-20 were all clearly lower (0.1%-0.8%) than more recent rates from the 6 surveys based on DSM-III-R (1.3%-1.6%),22-25,88 showing the varying prevalence of bipolar 1 disorders. Of the 4 surveys to assess lifetime DSM-III bipolar 2 disorder,11,24,27,89 rates ranged from 0.5% to 3.0%, similar to the variation observed for DSM-III-R bipolar 2 disorder (0.2%-2.0%).11,24,25,90 The NESARC rates for bipolar disorders are somewhat higher than those found for the DSM-III-R. Rates across different surveys vary, potentially explained by true differences as well as methodological factors (response rates, diagnostic criteria, instability due to very small numbers of cases in smaller surveys, measures). The NESARC rates of MDD are slightly lower than those from other DSM-III-R and DSM-IV studies, perhaps due to the assessment of the DSM-IV CSC criterion. It is clear, however, that rates of both MDD and bipolar disorders increased since the early 1980s.

The NESARC indicated a continued lack of treatment for many respondents with MDD. This was especially pronounced among men with the disorder, of whom 50.5% received no treatment. The suffering and social and economic burden of this disease is avoidable through highly effective pharmacological and psychological treatments. Projections suggest that by 2020, MDD will be responsible for a larger burden of disease than any other illness.99 International analysis indicate that the burden of this disease can largely be alleviated by appropriate treatment strategies100 and that this is cost-effective even in resource-poor regions.93 While the proportion of treated cases was higher than in previous decades,94 the NESARC shows that efforts remain needed to deliver effective treatments for major depression to the many who still need them.

The comorbidity of substance dependence with MDD predicts poor outcome among clinic patients,97 especially in studies with psychometrically sound measures of MDD and response rates greater than 0.70.95 A decade ago, treating depression among those with substance disorders was discouraged.96 Today, that picture has changed, informed by epidemiologic surveys97 and numerous clinical trials of patients with comorbidities. Treating MDD that is comorbid with alcohol or drug dependence is now recommended as long as care is taken in diagnosing depression.96 As shown, MDD is prevalent and commonly comorbid with substance dependence. Because MDD is treated increasingly in the primary care sector,97 disseminating information on the treatment of MDD that is comorbid with substance dependence may be helpful for physicians and patients.

The NESARC also showed high comorbidity of MDD with anxiety disorders. While reviews suggest that pharmacotherapy and psychosocial therapy are both viable treatment alternatives,87,98 far fewer randomized trials have focused specifically on this type of comorbidity97 compared with comorbid MDD and substance dependence, leaving the treatment response of MDD that is comorbid with anxiety disorders less clear. Similar comments
apply to the need for more information on treating co-morbid MDD and PDs.

This study provides the most comprehensive information on the epidemiology of MDD among US adults to date. The study has considerable advantages over other surveys. These include the unprecedented sample size (43,093), providing small, stable estimates of even rare conditions. Other advantages include the high response rate (81%), oversampling of disadvantaged minority groups, inclusion of Axis II disorders, and inclusion of Alaska and Hawaii in the sampling frame. Further, pain-taking supervision included reconfirmation of whole sections of the interview with a random 10% of the sample. The 3-year wave 2 now in the field will allow use of wave 1 results as a platform for investigation of prospective questions. Finally, the data set, the interview, descriptive materials, and citations are already on a Web site (http://niaaa.census.gov/), providing rapid transparency and openness about the NESARC and its methods.

Our findings provide new insights into the prevalence of MDD, how this compares with earlier surveys, and its current demographic and psychiatric correlates. The US rates of MDD are clearly higher than those in the 1980s. With the aging of the “baby boom” cohort, the age distribution of lifetime MDD has changed. The average episode now lasts nearly 6 months. High rates are found in Native Americans. The lower rates found for Hispanics and Asians warrant explanation but do not diminish the need to reduce treatment disparities among minority groups. The variation in comorbidity by specific disorder highlights the importance of not collapsing disorders into broad categories and the need to better understand the variation. Given the seriousness of MDD, the importance of information on its prevalence, demographic correlates, and psychiatric comorbidity cannot be underestimated. This study provides such information and the grounds for further investigation in a number of areas.

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