Lifetime and 12-Month Prevalence of *DSM-III-R* Psychiatric Disorders in the United States

Results From the National Comorbidity Survey

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Background: This study presents estimates of lifetime and 12-month prevalence of 14 *DSM-III-R* psychiatric disorders from the National Comorbidity Survey, the first survey to administer a structured psychiatric interview to a national probability sample in the United States.

Methods: The *DSM-III-R* psychiatric disorders among persons aged 15 to 54 years in the noninstitutionalized civilian population of the United States were assessed with data collected by lay interviewers using a revised version of the Composite International Diagnostic Interview.

Results: Nearly 50% of respondents reported at least one lifetime disorder, and close to 30% reported at least one 12-month disorder. The most common disorders were major depressive episode, alcohol dependence, social phobia, and simple phobia. More than half of all lifetime disorders occurred in the 14% of the population who had a history of three or more comorbid disorders. These highly comorbid people also included the vast majority of people with severe disorders. Less than 40% of those with a lifetime disorder had ever received professional treatment, and less than 20% of those with a recent disorder had been in treatment during the past 12 months. Consistent with previous risk factor research, it was found that women had elevated rates of affective disorders and anxiety disorders, that men had elevated rates of substance use disorders and antisocial personality disorder, and that most disorders declined with age and with higher socioeconomic status.

Conclusions: The prevalence of psychiatric disorders is greater than previously thought to be the case. Furthermore, this morbidity is more highly concentrated than previously recognized in roughly one sixth of the population who have a history of three or more comorbid disorders. This suggests that the causes and consequences of high comorbidity should be the focus of research attention. The majority of people with psychiatric disorders fail to obtain professional treatment. Even among people with a lifetime history of three or more comorbid disorders, the proportion who ever obtain specialty sector mental health treatment is less than 50%. These results argue for the importance of more outreach and more research on barriers to professional help-seeking.

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THIS REPORT presents data on the lifetime and 12-month prevalence of 14 *DSM-III-R* psychiatric disorders assessed in the National Comorbidity Survey (NCS). The NCS is a congressionally mandated survey designed to study the comorbidity of substance use disorders and nonsubstance psychiatric disorders in the United States. The NCS is the first survey to administer a structured psychiatric interview to a representative national sample in the United States. The need for such a survey was noted 15 years ago in the report of the President's Commission on Mental Health and Illness.[1] It was impossible to undertake such a survey at that time, though, due to the absence of a structured research diagnostic interview capable of generating reliable psychiatric diagnoses in general population samples. Recognizing this need, the National Institute of Mental Health, Bethesda, Md, funded the development of the Diagnostic Interview Schedule (DIS),[2] a research diagnostic interview that can be administered by trained interviewers who are not clinicians. The DIS was first used

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METHODS

SAMPLE

The NCS is based on a stratified, multistage area probability sample of persons aged 15 to 54 years in the noninstitutionalized civilian population in the 48 coterminous states. The inclusion of respondents aged as young as 15 years, compared with the 18-year-old lower age limit found in most general population surveys, was based on an interest in minimizing recall bias of early-onset disorders. The exclusion of respondents aged older than 54 years was based on evidence from the ECA Study that active comorbidity between substance use disorders and nonsubstance psychiatric disorders is much lower among persons aged older than 54 years than among those aged 54 years and younger. The NCS also includes a supplemental sample of students living in campus group housing. The survey was administered by the staff of the Survey Research Center at the University of Michigan (UM), Ann Arbor, between September 14, 1990, and February 6, 1992. The response rate was 82.6%. Cooperation in listed households did not differ markedly by age or sex, the only two listing variables available for all selected respondents. A total of 8098 respondents participated in the survey. Based on previous evidence that survey nonrespondents have higher rates of psychiatric disorder than respondents,[11,12] a supplemental nonresponse survey was carried out in parallel with the main survey. In this supplemental survey, a random sample of initial nonrespondents was offered a financial incentive to complete a short form of the diagnostic interview. Elevated rates of both lifetime and current psychiatric disorders were found among these initial nonrespondents. A nonresponse adjustment weight was constructed for the main survey data to compensate for this systematic nonresponse. A second weight was used to adjust for variation in probabilities of selection both within and between households. A third weight was used to adjust the data to approximate the national population distributions of the cross-classification of age, sex, race/ethnicity, marital status, education, living arrangements, region, and urbanicity as defined by the 1989 US National Health Interview Survey.[13] A comparison of weighted and unweighted NCS data with national distributions on a range of demographic variables is presented in **Table 1**.

DIAGNOSTIC ASSESSMENT

The psychiatric diagnoses reported below are based on the *DSM-III-R*.[6] The diagnostic interview used to generate these diagnoses is a modified version of the Composite International Diagnostic Interview (CIDI),[14] a state-of-the-art structured diagnostic interview based on the DIS and designed to be used by trained interviewers who are not clinicians.[15] We deleted diagnoses known to have low prevalence in population-based surveys, such as somatization disorder. We also deleted the Folstein-McHugh Mini-Mental State Examination, which is included in the full CIDI, based on pilot test results showing that respondents in the 15- to 54-year-old age range only rarely have high error scores and that those with high error scores in this age range disproportionately come from the foreign-born and the poorly educated population groups. Our modifications of the remaining sections of the CIDI included adding commitment and motivation probes for recall of lifetime episodes, and including clarifying probes for CIDI questions found in pilot work to be unclear or confusing to respondents.

The *DSM-III-R* diagnoses included in the core NCS include major depression, mania, dysthymia, panic disorder, agoraphobia, social phobia, simple phobia, generalized anxiety disorder, alcohol abuse, alcohol dependence, drug abuse, drug dependence, antisocial personality disorder (ASPD), and nonaffective psychosis (NAP). Twelve-month diagnoses of substance use disorders were made in the subsample of respondents who qualified for the lifetime diagnosis and who reported at least one *DSM-III-R* symptom in the 12 months prior to the interview. Nonaffective psychosis is a summary category made up of schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder, and atypical psychosis. We also constructed a summary category for 12-month "severe" disorder, defined as (1) 12-month mania or NAP, (2) lifetime mania or NAP with 12-month treatment or role impairment, or (3) 12-month depression or panic disorder with severe impairment (hospitalization or use of antipsychotic medication).

World Health Organization field trials of the CIDI have documented good interrater reliability,[16,17] test-retest reliability,[18,19] and validity of almost all diagnoses.[20-26] The exception is acute psychotic disorder, which has been shown to be diagnosed with low reliability and validity in structured interviews like the CIDI.[27,28] Based on this evidence, the NCS included clinical reinterviews with respondents who reported any evidence of psychotic symptoms. These reinterviews were administered by experienced clinicians using an adapted version of the Structured Clinical Interview for *DSM-III-R*,[29] an instrument with demonstrated reliability in the diagnosis of schizophrenia.[30] The NCS diagnoses of schizophrenia and other nonaffective psychotic disorders (NAPs) are based on these clinical reinterviews rather than on the UM-CIDI interviews.

INTERVIEWERS AND INTERVIEWER TRAINING

As noted above, the NCS was carried out by the field staff of the Survey Research Center at the UM. The 158 interviewers who participated in the NCS had an average of 5 years of prior interviewing experience with the Survey Research Center. In addition, the NCS interviewers went through a 7-day study-specific training program in the use of the UM-CIDI. Fieldwork was closely monitored throughout the entire data collection period. Three field quality control procedures are worth noting. First, completed interviews were edited by one of 18 regional supervisors before they were returned to the national field office. This al-

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lowed rapid detection of missing data and unclear responses. Incomplete interviews were returned to the interviewer, who recontacted the respondent to obtain the missing information. Second, a random sample of respondents was recontacted by the field supervisors to verify the accuracy of interviewer performance. Third, the field edits were checked at the national field office as soon as interviews were received. This provided a second check on interviewer performance as well as a check on the accuracy of the supervisor's editing. Supervisors were contacted whenever errors were found, and the interview was sent back to the field for resolution.

ANALYSIS PROCEDURES

As a result of the complex sample design and weighting, special software was required to estimate SEs. Standard errors of proportions were estimated by using the Taylor series linearization method.[31] The PSRATIO program in the OSIRIS software package[32] was used to make these calculations. Standard errors of odds ratios (ORs) were estimated by using the method of Balanced Repeated Replication in 44 design-based balanced subsamples.[33,34] The LOGISTIC program in the SAS software package[35] was used to make these calculations.

in the Epidemiologic Catchment Area (ECA) Study, a landmark study that interviewed more than 20 000 respondents in a series of five community epidemiologic surveys. The ECA Study has been the main source of data in the United States on the prevalence of psychiatric disorders and utilization of services for these disorders for the past decade.[3-5]

The NCS was designed to take the next step beyond the ECA Study. Three main advances are noteworthy. First, the NCS diagnoses are based on *DSM-III-R*[6] rather than *DSM-III*[7] criteria. Questions are also included in the interview that allow some comparisons with *DSM-IV*[8] and with the *International Classification of Diseases (ICD-10)* Diagnostic Criteria for Research.[9] Second, while the ECA Study was designed primarily as a prevalence and incidence study, the NCS was designed to be a risk factor study as well. As a result, the NCS interview contains a much more comprehensive risk factor battery than the ECA Study, including family history Research Diagnostic Criteria[10] assessments of parental psychopathology, questions about childhood family adversity, measures of social networks and support, and information about stressful life events and difficulties. Third, while the goals of the ECA Study to include institutional respondents and clinical reappraisals made it necessary to carry out the ECA Study in a small number of local samples, our different goals made it possible to carry out the NCS in a national sample. As a result, we are able to study regional variations in specific psychiatric disorders and urban-rural differences in unmet need for services as well as to provide the first nationally representative data that can be used in the current debate about health care policy in the United States.

RESULTS

THE PREVALENCE OF PSYCHIATRIC DISORDERS

The results in **Table 2** show UM-CIDI/*DSM-III-R* prevalence estimates of the 14 lifetime and 12-month disorders assessed in the core NCS interview. Lifetime prevalence is the proportion of the sample who *ever* experienced a disorder, while 12-month prevalence is the proportion who experienced the disorder at some time in the 12 months before the interview. The prevalence estimates in Table 2 are presented without exclusions for *DSM-III-R* hierarchy rules. Standard errors are reported in parentheses.

The most common psychiatric disorders were major depression and alcohol dependence. More than 17% of respondents had a history of major depressive episode (MDE) in their lifetime, and more than 10% had an episode in the past 12 months. More than 14% of respondents had a lifetime history of alcohol dependence, and more than 7% continued to be dependent in the past 12 months. The next most common disorders were social and simple phobias, with lifetime prevalences of 13% and 11%, respectively, and 12-month prevalences close to 8% and 9%, respectively. As a group, substance use disorders and anxiety disorders were somewhat more prevalent than affective disorders. Approximately one in every four respondents reported a lifetime history of at least one substance use disorder, and a similar number reported a lifetime history of at least one anxiety disorder. Approximately one in every five respondents reported a lifetime history of at least one affective disorder. Anxiety disorders, as a group, are considerably more likely to occur in the 12 months before the interview (17%) than either substance use disorders (11%) or affective disorders (11%), suggesting that anxiety disorders are more chronic than either substance use disorders or affective disorders. The prevalence of other NCS disorders was quite low. Antisocial personality disorder, which was only assessed on a lifetime basis, was reported by more than 3% of respondents, while schizophrenia and other NAPs were found among only 0.7% of respondents. It is important to remember that the diagnosis of NAP was based on clinical reinterviews using the Structured Clinical Interview for *DSM-III-R* diagnosis rather than on the lay CIDI interviews. The prevalence estimates for NAP based on the UM-CIDI were considerably higher but were found to have low validity when judged in comparison with the clinical reappraisals (K.S.K., William Eaton, PhD, Janie Abelson, MSW, R.C.K., oral communication, September 1992).

As shown in the last row of Table 2, 48% of the sample reported a lifetime history of at least one UM-CIDI/*DSM-*

Table 1. Characteristics of NCS Respondents Compared With Those of the Total US Population*

	US Population†	% NCS Weighted	% NCS Unweighted
Sex			
M	49.1	49.5	47.5
F	50.9	50.5	52.5
Race			
W	75.0	75.3	75.1
B	11.9	11.5	12.5
Hispanic	8.6	9.7	9.1
Other	4.5	3.5	3.3
Education, y			
0-11	22.5	22.3	18.2
12	36.8	37.4	33.1
13-15	21.2	21.7	26.3
≥16	19.5	18.6	22.4
Marital status			
Married/cohabitation	59.8	62.9	54.4
Separated/widowed/ divorced	10.1	10.0	15.5
Never married	30.1	27.1	30.1
Region			
Northeast	20.0	20.2	19.2
Midwest	24.6	23.8	25.6
South	33.7	36.4	35.6
West	21.7	19.6	19.6
Age, y			
15-24	25.5	24.7	21.8
25-34	30.8	30.1	32.4
35-44	25.9	27.1	27.7
45-54	17.8	18.1	18.1
Urbanicity			
Large MSAs	71.2	67.8	68.9
Small MSAs	8.1	7.5	6.5
Not MSAs	20.7	24.7	24.6
Total N	65 244‡	8098	8098

*NCS indicates National Comorbidity Survey; large MSAs, counties in the US Bureau of the Census–defined metropolitan statistical areas with 250 000 or more residents; small MSAs, counties in MSAs containing less than 250 000 residents; and not MSAs, counties that are not in MSAs.

†The US population characteristics are based on results from the 1989 US National Health Interview Survey.

‡There were 65 244 household members in the sample households interviewed as part of the 1989 US National Health Interview Survey.

III-R disorder, and 29% had one or more disorders in the 12 months before the interview. While there is no meaningful sex difference in these overall prevalences, there are sex differences in the prevalences of specific disorders. Consistent with previous research,[36-40] men are much more likely to have substance use disorders and ASPD than women, while women are much more likely to have affective disorders (with the exception of mania, for which there is no sex difference) and anxiety disorders than men. The data also show, consistent with a trend found in the ECA Study,[41] that women in the household population are somewhat more likely to have NAP than men, although this sex difference is not statistically significant ($P>.05$).

A final observation about the results in Table 2 is that the sum of the individual prevalence estimates across the 14 disorders consistently exceeds the prevalence of having any disorder. This means that there is considerable comorbidity among these disorders. For example, while the 48% lifetime prevalence in the total sample means that 48 of every 100 respondents in the sample reported a lifetime history of at least one disorder, a summation of lifetime prevalence estimates for the separate disorders shows that these 48 individuals reported a total of 102 lifetime disorders (2.1 per person). As demonstrated in the next section of the article, this comorbidity is quite important for understanding the distribution of psychiatric disorders in the United States.

THE IMPORTANCE OF COMORBIDITY

It is beyond the scope of this article to delve into the many different types of comorbidity that exist in the NCS. Nevertheless, the aggregate results in **Table 3** document that these patterns are very important in understanding the distribution of psychiatric disorders among persons aged 15 to 54 years in the United States and provide an empirical rationale for more detailed examination of particular types of comorbidity in future analyses. The four rows of Table 3 represent the number of lifetime disorders reported by respondents. As shown in the first column, 52% of respondents never had any UM-CIDI/*DSM-III-R* disorder, 21% had one, 13% had two, and 14% had three or more disorders. Only 21% of all the lifetime disorders occurred in respondents with a lifetime history of just one disorder. This means that the *vast majority* of lifetime disorders in this sample (79%) were comorbid disorders. Furthermore, an even greater proportion of 12-month disorders occurred in respondents with a lifetime history of comorbidity. It is particularly striking that close to six (59%) of every 10 12-month disorders and nearly nine (89%) of 10 severe 12-month disorders occurred in the 14% of the sample with a lifetime history of three or more disorders. These results show that while a history of some psychiatric disorder is quite common among persons aged 15 to 54 years in the United States, the major burden of psychiatric disorder in this sector of our society is concentrated in a group of highly comorbid people who constitute about one sixth of the population. The more detailed disaggregation and investigation of these people is a major focus of the NCS.

UTILIZATION OF SERVICES

Although previous national surveys have asked about utilization of professional services for emotional problems,[42,43] no national survey until now has included a diagnostic assessment that could be used to define unmet need. This was done in the NCS by assessing both lifetime and recent

Table 2. Lifetime and 12-Month Prevalence of UM-CIDI/*DSM-III-R* Disorders*

	Male				Female				Total			
	Lifetime		12 mo		Lifetime		12 mo		Lifetime		12 mo	
Disorders	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Affective disorders												
Major depressive episode	12.7	0.9	7.7	0.8	21.3	0.9	12.9	0.8	17.1	0.7	10.3	0.6
Manic episode	1.6	0.3	1.4	0.3	1.7	0.3	1.3	0.3	1.6	0.3	1.3	0.2
Dysthymia	4.8	0.4	2.1	0.3	8.0	0.6	3.0	0.4	6.4	0.4	2.5	0.2
Any affective disorder	14.7	0.8	8.5	0.8	23.9	0.9	14.1	0.9	19.3	0.7	11.3	0.7
Anxiety disorders												
Panic disorder	2.0	0.3	1.3	0.3	5.0	1.4	3.2	0.4	3.5	0.3	2.3	0.3
Agoraphobia without panic disorder	3.5	0.4	1.7	0.3	7.0	0.6	3.8	0.4	5.3	0.4	2.8	0.3
Social phobia	11.1	0.8	6.6	0.4	15.5	1.0	9.1	0.7	13.3	0.7	7.9	0.4
Simple phobia	6.7	0.5	4.4	0.5	15.7	1.1	13.2	0.9	11.3	0.6	8.8	0.5
Generalized anxiety disorder	3.6	0.5	2.0	0.3	6.6	0.5	4.3	0.4	5.1	0.3	3.1	0.3
Any anxiety disorder	19.2	0.9	11.8	0.6	30.5	1.2	22.6	0.1	24.9	0.8	17.2	0.7
Substance use disorders												
Alcohol abuse without dependence	12.5	0.8	3.4	0.4	6.4	0.6	1.6	0.2	9.4	0.5	2.5	0.2
Alcohol dependence	20.1	1.0	10.7	0.9	8.2	0.7	3.7	0.4	14.1	0.7	7.2	0.5
Drug abuse without dependence	5.4	0.5	1.3	0.2	3.5	0.4	0.3	0.1	4.4	0.3	0.8	0.1
Drug dependence	9.2	0.7	3.8	0.4	5.9	0.5	1.9	0.3	7.5	0.4	2.8	0.3
Any substance abuse/dependence	35.4	1.2	16.1	0.7	17.9	1.1	6.6	0.4	26.6	1.0	11.3	0.5
Other disorders												
Antisocial personality	5.8	0.6	...	...	1.2	0.3	...	...	3.5	0.3	...	...
Nonaffective psychosis†	0.6	0.1	0.5	0.1	0.8	0.2	0.6	0.2	0.7	0.1	0.5	0.1
Any NCS disorder	48.7	0.2	27.7	0.9	47.3	1.5	31.2	1.3	48.0	1.1	29.5	1.0

**UM-CIDI indicates University of Michigan Composite International Diagnostic Interview; NCS, National Comorbidity Survey.*
†Nonaffective psychosis includes schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder, and atypical psychosis.

utilization of services from a wide variety of professionals in a number of different treatment settings. Summary results (**Table 4**) show that only four of every 10 respondents with a lifetime history of at least one UM-CIDI/*DSM-III-R* disorder ever obtained professional help for their disorders, only one in four obtained treatment in the mental health specialty sector, and about one in 12 were treated in substance abuse facilities. While nearly six in 10 persons who have a lifetime history of three or more disorders ever received professional treatment, only four in 10 of these highly comorbid people were treated in the mental health specialty sector, and about one in seven received treatment in substance abuse facilities. Among respondents with a 12-month disorder, only one in five obtained any professional help in the past year, one in nine obtained treatment in the mental health specialty sector, and one in 25 were treated in substance abuse facilities. Only about one third of persons with three or more disorders in the past year received any professional treatment in the past year, slightly more than one in five were treated in the mental health service sector, and about one in 12 received treatment in substance abuse facilities. These national patterns are broadly consistent with those from the five-site ECA sample,[5,44] in showing that the vast majority of people with recent disorders have not had recent treatment.

DEMOGRAPHIC CORRELATES OF DISORDER

Bivariate risk factor associations are reported for groupings of disorders in **Table 5** (lifetime) and **Table 6** (12 months). Based on findings in Table 3 that the majority of both lifetime and 12-month disorders, and the vast majority of severe disorders, occurred in people with a history of three or more disorders, we also included three or more disorders as an outcome variable in Tables 5 and 6. Associations are shown in the form of ORs with 95% confidence intervals (CIs). As noted above, these CIs are based on complex variance estimation techniques that adjust for the weighting and clustering of the sample data.

Sex

As mentioned previously in the discussion of Table 2, the NCS data are consistent with those of previous epidemiologic studies, in finding that women have higher prevalences than men of affective disorders (with the exception of mania, for which there is no sex difference), anxiety disorders, and NAP, and that men have higher rates than women of substance use disorders and ASPD. Furthermore, we find that women have higher prevalences than men of both lifetime and 12-month comorbidity of three or more disorders.

Table 3. The Concentration of Lifetime and 12-Month Disorders Among Persons With Lifetime Comorbidity

No. of Lifetime Disorders	Proportion of Sample		Proportion of Lifetime Disorders		Proportion of 12-mo Disorders		Proportion of Respondents With Severe 12-mo Disorders*	
	%	SE	%	SE	%	SE	%	SE
0	52.0	1.1	...	...	...	...	...	...
1	21.0	0.6	20.6	0.6	17.4	0.8	2.6	1.7
2	13.0	0.5	25.5	1.0	23.1	1.0	7.9	2.1
≥3	14.0	0.7	53.9	2.7	58.9	1.8	89.5	2.8

*Severe 12-month disorders include active mania, nonaffective psychosis, or active disorders of other types that either required hospitalization or created severe role impairment.

Age

In the absence of an extremely young age at onset, cohort effects, differential mortality, selection bias associated with age, and age-related differences in willingness to report symptoms, one would expect to find increasing lifetime prevalence of all disorders with age. However, the results in Table 5 show quite a different pattern, with the highest prevalences generally in the group aged 25 to 34 years and declining prevalences at later ages. This pattern is broadly consistent with the results of recent epidemiologic surveys,[36,45] in documenting increasing psychopathology in more recent cohorts. The pattern is even more pronounced in Table 6, where it is shown that 12-month disorders are consistently most prevalent in the youngest cohort (age range, 15 to 24 years) and generally decline monotonically with age.

Race

While the NCS results concerning sex and age are consistent with those of previous epidemiologic studies, this is less true for the results concerning race. Blacks in the NCS have significantly lower prevalences of affective disorders, substance use disorders, and lifetime comorbidity than whites. There are no disorders where either lifetime or active prevalence is significantly higher among blacks than whites. More detailed analyses (results available from the first author [R.C.K.]) show that these effects cannot be explained by controlling for income and education. The lower prevalence of affective disorders is consistent with, but more pronounced than, the ECA finding of a slightly lower rate in the 30- to 64-year-old age range among blacks than whites.[46] The lower prevalence of substance use disorders among blacks is consistent with the ECA finding of higher prevalence of drug and alcohol abuse and dependence among young whites compared with that among young blacks.[47,48] Our failure to find black-white differences in anxiety disorders (or, in more detailed analyses not reported here, in panic disorder, simple phobia, or agoraphobia) is consistent with the ECA finding that blacks and whites have similar prevalences of panic disorder[49] but inconsistent with the ECA finding that blacks have nearly twice the lifetime prevalence of simple phobia and agoraphobia.[50]

Hispanics in the NCS have significantly higher prevalences of current affective disorders and active comorbidity than non-Hispanic whites. There are no disorders where either lifetime or active prevalence is significantly lower among Hispanics than among non-Hispanic whites. The higher rate of affective disorders is inconsistent with that of the ECA Study, which found higher lifetime rates among whites and no race difference in active prevalence.[46] The failure to find a white vs Hispanic difference in anxiety disorders is inconsistent with the ECA finding that Hispanics have significantly lower lifetime rates of panic.[50] Furthermore, the NCS does not replicate the ECA finding that Hispanics have elevated rates of alcohol use disorders compared with whites.[47]

Socioeconomic Status

Consistent with previous research,[3,37,51-54] rates of almost all disorders decline monotonically with income and education. The ORs in Tables 5 and 6 comparing the lowest with highest income groups are significant in all equations. The coefficients comparing the middle vs highest income groups are significant in predicting anxiety disorders, ASPD, and comorbidity. The ORs for education are somewhat more variable, but the general pattern is still one of decline in the ORs from the lowest to highest education groups. One noteworthy exception is that lifetime substance use disorder is significantly higher in the *middle* education subsamples than among those with either the lowest or highest education. The significant ORs for both income and education are consistently larger in predicting 12-month than lifetime prevalence, which means that socioeconomic status is associated not only with onset but also with course of disorder. It is unclear from these data, though, whether this is due to causal influence or to drift. Finally, there is a consistent tendency for socioeconomic status to be more powerfully related to anxiety disorders than to affective disorders, suggesting indirectly that the resources associated with socioeconomic status are more protective against the onset and/or exacerbation of worries and fears than of sadness. We are un-

Table 4. Lifetime and 12-Month Utilization of Professional Services*

	No Disorder	Any Disorder	≥3 Disorders
Lifetime			
Any professional†			
%	15.3	42.0	58.8
SE	1.3	1.1	1.8
Mental health specialty‡			
%	8.1	26.2	41.0
SE	1.2	1.1	2.1
Substance abuse facility§			
%	0.3	8.4	14.8
SE	0.2	0.7	1.5
12 mo			
Any professional			
%	7.0	20.9	34.2
SE	0.7	1.1	3.0
Mental health specialty			
%	2.7	11.5	22.5
SE	0.6	0.8	2.6
Substance abuse facility			
%	0.1	4.0	8.6
SE	0.04	0.7	2.5

*Top part of Table 4 relates to lifetime disorders/utilization; bottom part, 12-month disorders/utilization.

†Any professional indicates hospitalization or outpatient treatment by a mental health specialist, physician, social worker, counselor, nurse, or other health professional, including treatment in a substance abuse facility.

‡Mental health specialty indicates hospitalization or outpatient treatment by a psychiatrist or psychologist or treatment in a substance abuse facility.

§Substance abuse facility indicates hospitalization for drug or alcohol problems or treatment in a drug or alcohol outpatient clinic or drop-in center or program for people with emotional problems with alcohol or drug abuse.

aware of any previous research on this issue, although this consistent pattern in our data suggests that this might be a fruitful area for future investigation.

Urbanicity

Urbanicity is examined here at the county level by distinguishing major metropolitan counties (major metropolitan areas), urbanized counties that are not in major metropolitan areas (other urban areas), and rural counties (rural). It is important to note that significant within-county differences in the prevalence of some disorders has been found in previous research.[55] Within-county comparisons will be made in later analyses of the NCS, but these comparisons cannot yet be carried out because of current incompleteness in the NCS geocoding, pending release of final matching information from the 1990 census.

As seen in Tables 5 and 6, the effects of urbanicity at the county level are generally not significant. The single exception is that residents of major metropolitan counties are more likely than residents of rural counties to have comorbidity in the 12 months before the interview (OR=1.44). The coefficient that compares residents of other urbanized counties with residents of rural counties on the same outcome is very similar in magnitude (OR=1.41) and significant at the .06 level, which means that it is the low rate of comorbidity in rural America rather than a high rate in major metropolitan counties that underlies this pattern. This one significant coefficient could have occurred by chance in 22 different comparisons (two urbanicity coefficients for each of 11 outcomes), although there is a general trend in the data for rural residents to have the lowest levels of disorder (in 10 of the 11 outcomes in Tables 5 and 6).

Region

There are a number of significant regional differences in lifetime prevalence. Substance use disorders, ASPD, and comorbidity are all highest in the West. Anxiety disorders are highest in the Northeast. Virtually all disorders are lowest in the South. None of these patterns, however, is replicated in parallel analyses of 12-month disorders, implying that region is associated in different ways with onset and course.

COMMENT

LIMITATIONS

Two data collection limitations need to be noted. First, the NCS is a cross-sectional survey that relies entirely on retrospective reports to assess the prevalence of lifetime disorders. Commitment and memory probes were used to minimize recall problems, but we recognize that whatever success we had in this regard was only partial. Long-term longitudinal data collection is needed to evaluate the magnitude of recall failure and to adjust for its effects on prevalence estimates. Second, even in cases where respondents describe recent disorders, our diagnostic assessment is based on only a single structured interview administered by nonclinicians. This is a practical necessity in a survey as large and geographically dispersed as the NCS. Yet, it is important to recognize that we pay a price for this ease of implementation in reduced diagnostic precision, which could have been improved if it had been possible to use clinical interviewers, to carry out multiple interviews, and to use ancillary information from informants and institutional records. The fact that these things were not done means that the prevalences reported here should be interpreted as estimates rather than as definite diagnoses.

PREVALENCE

The NCS results show that psychiatric disorders are more prevalent than previous research would lead us to believe. Close to half of all respondents report a lifetime history of at least one UM-CIDI/*DSM-III-R* disorder. One fifth of re-

Table 5. Demographic Correlates of Lifetime Psychiatric Disorders*

	Any Affective Disorder		Any Anxiety Disorder		Any Substance Use Disorder		ASPD†		Any Disorder		≥3 Disorders	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sex												
M	1.00	...	1.00	...	1.00	...	5.16‡	2.90-9.20	1.00	...	1.00	...
F	1.82‡	1.56-2.12	1.85‡	1.58-2.16	0.40‡	0.34-0.46	1.00	...	0.95	0.83-1.08	1.24‡	1.02-1.50
Age, y												
15-24	0.85	0.65-1.11	1.13	0.90-1.43	1.36‡	1.01-1.83	2.56‡	1.52-4.30	1.15	0.92-1.43	1.18	0.88-1.58
25-34	0.97	0.77-1.22	1.13	0.90-1.42	1.99‡	1.53-2.57	1.83‡	1.08-3.12	1.36‡	1.12-1.65	1.47‡	1.07-2.02
35-44	1.06	0.81-1.38	1.05	0.83-1.34	1.58‡	1.25-1.99	1.01	0.50-2.03	1.20	0.99-1.46	1.19	0.87-1.62
45-54	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Race												
W	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
B	0.63‡	0.46-0.87	0.77	0.58-1.01	0.35‡	0.27-0.46	0.89	0.56-1.41	0.50‡	0.41-0.60	0.67‡	0.45-0.98
Hispanic	0.96	0.72-1.27	0.90	0.71-1.15	0.80	0.62-1.03	1.43	0.92-2.23	0.86	0.69-1.06	0.99	0.73-1.35
Income, $												
0-19 000	1.56‡	1.23-1.98	2.00‡	1.66-2.41	1.27‡	1.05-1.54	2.98‡	1.71-5.20	1.49‡	1.25-1.78	2.46‡	1.87-3.24
20 000-34 000	1.19	0.89-1.60	1.52‡	1.21-1.90	1.06	0.80-1.41	2.16‡	1.15-4.06	1.21	0.95-1.53	1.71‡	1.20-2.43
35 000-69 000	1.16	0.88-1.51	1.48‡	1.16-1.90	1.06	0.83-1.36	1.59	0.82-3.10	1.21	0.97-1.49	1.55‡	1.12-2.15
≥70 000	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Education, y												
0-11	0.98	0.80-1.20	1.86‡	1.53-2.26	0.99	0.77-1.27	14.13‡	6.05-32.99	1.17	0.96-1.42	2.15‡	1.60-2.90
12	1.00	0.82-1.24	1.76‡	1.42-2.20	1.25‡	1.05-1.48	4.29‡	2.07-8.90	1.25‡	1.07-1.46	2.09‡	1.52-2.86
13-15	1.05	0.89-1.25	1.44‡	1.15-1.79	1.20‡	1.01-1.43	3.32‡	1.43-7.72	1.21‡	1.04-1.40	1.73‡	1.25-2.39
≥16	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Urbanicity												
Major metropolitan	1.26	0.91-1.76	0.98	0.76-1.26	1.09	0.82-1.45	1.27	0.80-1.99	1.10	0.83-1.47	1.20	0.86-1.68
Other urban	1.20	0.85-1.71	1.00	0.74-1.35	1.10	0.80-1.51	0.98	0.61-1.58	1.09	0.78-1.53	1.18	0.80-1.73
Rural	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Region												
Midwest	1.06	0.85-1.33	1.17	0.93-1.46	1.21	0.96-1.54	1.34	0.89-2.00	1.19	0.94-1.49	1.00	0.76-1.33
Northeast	1.00	0.76-1.30	1.29‡	1.07-1.56	1.33‡	1.04-1.69	1.49	0.83-2.69	1.25‡	1.03-1.52	1.35	0.98-1.85
West	1.32	1.00-1.74	1.15	0.87-1.52	1.57‡	1.15-2.14	2.40‡	1.49-3.85	1.38‡	1.05-1.81	1.43‡	1.03-1.98
South	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...

**ASPD indicates antisocial personality disorder; OR, odds ratio; and CI, confidence interval.*
†Results concerning ASPD exclude respondents aged 15 to 17 years because the diagnosis requires that the respondent be at least 18 years of age.
‡P<.05 (two tailed).

spondents have a lifetime history of an affective disorder, one fourth have a history of an anxiety disorder, and one fourth have a history of a substance use disorder. A 12-month prevalence of at least one disorder is nearly 30% in the sample as a whole, with more respondents reporting a 12-month anxiety disorder (17.2%) than either affective disorders (11.3%) or a substance use disorder (11.3%). The high ratio of a 12-month to lifetime anxiety disorder prevalence suggests indirectly that they are more chronic than either affective disorders or substance use disorders.

The fact that the NCS prevalence estimates are higher than in previous epidemiologic surveys could be due, at least in part, to secular trends. A number of methodologic factors could also be involved, including the fact that the NCS is based on a national sample, concentrates on a younger age range than previous surveys, uses a correction weight to adjust for nonresponse bias, and reports *DSM-III-R* diagnoses while earlier epidemiologic surveys used the *DSM-III* diagnostic system. Any attempt to compare prevalence estimates in the NCS with those in earlier surveys needs to grapple with the implications of all these issues.

It is also important to recognize that while the diagnostic instrument used in the NCS is very similar to the diagnostic instrument used in the ECA Study and other recent epidemiologic studies (the DIS), there are differences in wording and depth of probing that could have important effects on prevalence estimates. For example, the UM-CIDI assesses phobias by presenting the respondent with three separate lists containing a total of 20 prototypic feared objects and situations (six for social phobia, nine for simple phobia, and five for agoraphobia), while the version of the DIS used in the ECA Study combined all these objects and situations into a single list containing a total of only 15 items. The assessment of social phobia, in par-

Table 6. Demographic Correlates of 12-Month Psychiatric Disorders*

	Any Affective Disorder		Any Anxiety Disorder		Any Substance Use Disorder		Any Disorder		≥3 Disorders	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sex										
M	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
F	1.76†	1.43-2.18	2.19†	1.88-2.55	0.37†	0.31-0.43	1.18†	1.07-1.31	1.55†	1.15-2.10
Age, y										
15-24	1.67†	1.14-2.44	1.40†	1.09-1.80	3.65†	2.29-5.84	2.06†	1.66-2.56	2.08†	1.17-3.70
25-34	1.32	0.89-1.96	1.13	0.85-1.51	2.65†	1.72-4.06	1.51†	1.20-1.88	1.66	0.88-3.16
35-44	1.35	0.93-1.96	0.98	0.76-1.26	2.00†	1.31-3.05	1.24	0.98-1.56	1.36	0.75-2.49
45-54	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Race										
W	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
B	0.78	0.54-1.14	0.90	0.65-1.26	0.47†	0.35-0.64	0.70†	0.55-0.90	1.04	0.53-2.06
Hispanic	1.38†	1.02-1.86	1.17	0.93-1.49	1.04	0.74-1.46	1.11	0.91-1.35	1.86†	1.23-2.82
Income, $										
0-19 000	1.73†	1.29-2.32	2.12†	1.63-2.77	1.92†	1.36-2.71	1.92†	1.54-2.39	3.36†	1.95-5.79
20 000-34 000	1.13	0.80-1.59	1.56†	1.18-2.06	1.12	0.79-1.60	1.24	0.97-1.57	2.10†	1.16-3.83
35 000-69 000	1.01	0.75-1.37	1.50†	1.15-1.97	1.11	0.75-1.64	1.20	0.93-1.55	1.66†	1.02-2.73
≥70 000	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Education, y										
0-11	1.79†	1.31-2.43	2.82†	2.26-3.51	2.10†	1.56-2.84	2.33†	1.91-2.84	3.76†	2.45-5.76
12	1.38†	1.00-1.89	2.10†	1.66-2.67	1.80†	1.40-2.32	1.79†	1.46-2.21	2.54†	1.70-3.78
13-15	1.37†	1.02-1.84	1.60†	1.19-2.15	1.70†	1.20-2.42	1.58†	1.28-1.96	2.06†	1.18-3.59
≥16	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Urbanicity										
Major metropolitan	1.21	0.76-1.92	1.04	0.77-1.41	1.09	0.79-1.50	1.05	0.75-1.47	1.44†	1.00-2.08
Other urban	1.11	0.69-1.79	1.18	0.85-1.63	1.12	0.77-1.64	1.11	0.78-1.60	1.41	0.97-2.04
Rural	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...
Region										
Midwest	0.84	0.63-1.13	1.07	0.81-1.41	1.22	0.97-1.53	1.04	0.80-1.34	0.79	0.56-1.11
Northeast	0.87	0.62-1.21	1.24	0.99-1.57	1.30	0.98-1.72	1.09	0.85-1.39	1.08	0.74-1.59
West	0.98	0.59-1.64	1.12	0.86-1.47	1.13	0.86-1.48	1.02	0.77-1.33	1.07	0.61-1.88
South	1.00	...	1.00	...	1.00	...	1.00	...	1.00	...

**OR indicates odds ratio; CI, confidence interval.*
†P<.05 (two tailed).

ticular, is more thorough in the UM-CIDI than in the DIS, and this may explain why the NCS estimate of the prevalence of social phobia is much higher than the ECA estimate.

A final methodologic factor of importance in accounting for the comparatively higher NCS prevalence estimates is that the NCS included more sensitive probes for lifetime recall than did earlier epidemiologic surveys. Two aspects of this probing are noteworthy. First, based on the results of pilot tests that showed that respondents underreport stem questions once they recognize that positive responses will lead to more detailed questions, we included diagnostic stem questions for a number of disorders in a life review section that was administered before probing any positive stem responses. Second, this life review section used probes to stimulate motivation for lifetime recall in an effort to aid memory search. Based on these refinements, NCS respondents reported more positive responses to virtually all stem questions than ECA respondents. This, in turn, led to higher prevalence estimates.

The higher prevalence in the NCS compared with that in the ECA Study is particularly pronounced for MDE (lifetime prevalence of 17.1% in the NCS compared with 6.3% in the ECA Study). We suspect that this is due, at least in part, to the fact that failure to recall lifetime episodes of MDE is greater than for other disorders and that our refinements to aid recall had a more powerful effect on estimates of MDE than other disorders. This cannot explain the fact, though, that 12-month prevalence of MDE is much higher in the NCS than in the ECA Study. A factor relevant to this difference is that the NCS used three separate stem questions for MDE concerning periods of feeling "sad, blue, or depressed," feeling "down in the dumps or gloomy," and "losing interest in most things like work, hobbies, or things you

usually like to do for fun." The ECA Study, in comparison, used only one stem question that combined the content of our first and third questions. It is noteworthy that the estimated prevalence of MDE in the NCS is quite similar to the estimates in previous epidemiologic studies that used clinical interviews like the Schedule for Affective Disorders and Schizophrenia and the Structured Clinical Interview for *DSM-III-R*.[56-58] The fact that our refinements did not lead to overreporting is indicated by the fact that blind clinical reappraisals of the UM-CIDI diagnosis of MDE in a random subsample of NCS respondents using the Structured Clinical Interview for *DSM-III-R*[29] as the validation standard yielded a positive predictive value of 0.70 (±0.10), a rate that compares favorably with that of similar investigations of the ECA diagnostic classification of MDE.[2,27,28]

COMORBIDITY

One important accomplishment of the ECA Study was that it documented that comorbidity among psychiatric disorders is quite high in the general population. More than 60% of the ECA respondents with at least one lifetime disorder had two or more disorders.[3] The ECA respondents with comorbidity were also found to have higher utilization of services.[59] It was also found that mental disorders are associated with substance abuse prevalence and specialty sector treatment.[60] The NCS was designed to build on these results and to provide more fine-grained data about the prevalence, causes, and consequences of psychiatric comorbidity. We have taken a first step in that direction in the present report. We find that 56% of NCS respondents with a history of at least one disorder had two or more disorders. We also find that the majority of lifetime disorders and an even greater percentage of 12-month disorders occur in the roughly one sixth of the population with a lifetime history of three or more disorders. The fact that this segment of the population accounts for a higher percentage of 12-month disorders than lifetime disorders means that comorbidity is, in general, associated with a more serious course of illness, a result consistent with the findings of clinical investigations.[61-65] Future analyses of the NCS data will disaggregate this overall pattern to investigate the possibility that the effect of comorbidity on course can be further specified as due to particular primary disorders, secondary disorders, or primary-secondary combinations and whether these effects are specified by age at onset, family history, and other individual differences.

UTILIZATION OF SERVICES

Our findings regarding utilization of services are broadly consistent with those of previous research,[5,43,44] in showing that the majority of people with psychiatric disorders receive no professional treatment and that fewer yet receive treatment in the mental health specialty sector. Although more likely than others to obtain treatment, we also found that fewer than half of people with three or more lifetime comorbid disorders ever obtained mental health specialty sector treatment.

It is noteworthy that the ECA estimate of the percentage of people with a disorder who received any professional treatment during the past 12 months is roughly 25% higher than the NCS estimate.[5] This finding, coupled with the fact that the NCS finds a considerably higher 12-month prevalence of disorder than the ECA Study, means that the NCS finds considerably more unmet need for mental health services than the ECA Study. More detailed analyses are planned to investigate this difference and to determine how much of it is due to time trends, to the fact that the ECA Study was based on a largely urbanized population where access to professional services is greater than in the rest of the population, or to other reasons.

RISK FACTORS

For the most part, the risk factor results reported above are consistent with previous investigations in finding more affective disorders and anxiety disorders among women, more substance use disorders and ASPD among men, and declining rates of most disorders with age and higher socioeconomic status. The other risk factor results are more provisional, though, due to the fact that they either fail to replicate previous research (in the case of the results regarding race) or are new results (in the cases of urbanicity and region). It is important to remember, in this regard, that we examined close to 200 separate coefficients in the risk factor analysis. It is quite likely that some of the significant results in this large set are due to chance. Future analyses of the NCS need to examine these risk factor results in more detail to determine whether they are stable. Perhaps the most interesting of these results concerns the fact that respondents living in rural areas have a 40% lower odds of 12-month comorbidity of three or more disorders than their urban counterparts. This association is much more powerful than the associations of urbanicity with the prevalence of individual disorders, which means that while rural Americans are no more likely to suffer from a psychiatric disorder, their disorders are more likely to be "pure" than comorbid. If this result is stable, it has important implications for the provision of services to the rural mentally ill, where medical care is more likely to come from the general medical sector than from the specialty mental health sector. Comorbidity is recognized as a major complication that impedes the ability of the general medical sector to provide effective care.[63] The fact that 1-year comorbidity of three or more disorders is lowest in rural areas means that the magnitude of this complication is considerably less than expected from our total population estimate.

Another intriguing aspect of the results regarding low prevalence of disorder in rural counties is that this is true despite the fact that rural Americans are exposed to

much greater financial adversity than their urban counterparts.[66] The same can be said for the low prevalence of affective and substance use disorders among blacks compared with that among whites, patterns that exist despite the fact that blacks have much lower aggregate levels of both income and education than whites.[66] Future analyses of the NCS data will explore these patterns in more depth with the expectation that some as yet unknown resources protect rural people and blacks from the adverse psychiatric effects that we would otherwise expect to be associated with their stressful lives.

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