SPECIAL ARTICLE

# Prevalence and Treatment of Mental Disorders, 1990 to 2003

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ABSTRACT

**BACKGROUND**

Although the 1990s saw enormous change in the mental health care system in the United States, little is known about changes in the prevalence or rate of treatment of mental disorders.

**METHODS**

We examined trends in the prevalence and rate of treatment of mental disorders among people 18 to 54 years of age during roughly the past decade. Data from the National Comorbidity Survey (NCS) were obtained in 5388 face-to-face household interviews conducted between 1990 and 1992, and data from the NCS Replication were obtained in 4319 interviews conducted between 2001 and 2003. Anxiety disorders, mood disorders, and substance-abuse disorders that were present during the 12 months before the interview were diagnosed with the use of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV). Treatment for emotional disorders was categorized according to the sector of mental health services: psychiatry services, other mental health services, general medical services, human services, and complementary–alternative medical services.

**RESULTS**

The prevalence of mental disorders did not change during the decade (29.4 percent between 1990 and 1992 and 30.5 percent between 2001 and 2003, P=0.52), but the rate of treatment increased. Among patients with a disorder, 20.3 percent received treatment between 1990 and 1992 and 32.9 percent received treatment between 2001 and 2003 (P<0.001). Overall, 12.2 percent of the population 18 to 54 years of age received treatment for emotional disorders between 1990 and 1992 and 20.1 percent between 2001 and 2003 (P<0.001). Only about half those who received treatment had disorders that met diagnostic criteria for a mental disorder. Significant increases in the rate of treatment (49.0 percent between 1990 and 1992 and 49.9 percent between 2001 and 2003) were limited to the sectors of general medical services (2.59 times as high in 2001 to 2003 as in 1990 to 1992), psychiatry services (2.17 times as high), and other mental health services (1.59 times as high) and were independent of the severity of the disorder and of the sociodemographic characteristics of the respondents.

**CONCLUSIONS**

Despite an increase in the rate of treatment, most patients with a mental disorder did not receive treatment. Continued efforts are needed to obtain data on the effectiveness of treatment in order to increase the use of effective treatments.

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THE U.S. SURGEON GENERAL'S REPORT on mental health[1] and the President's New Freedom Commission on Mental Health[2] have both called for expanding treatment for mental disorders. Planning this expansion requires accurate data on the prevalence and rate of treatment of mental disorders. In the 1980s, the Epidemiologic Catchment Area (ECA) Study found that 29.4 percent of the adults interviewed had had a mental disorder at some time in the 12 months before the interview (referred to as a "12-month mental disorder"), according to the criteria of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, third edition (DSM-III).[3] A fifth of those with a 12-month disorder received treatment. Half of those who received treatment did not meet the criteria for a 12-month disorder according to the ECA Study or the DSM-III. A decade later, the National Comorbidity Survey (NCS) found that 30.5 percent of people 15 to 54 years of age had conditions that met the criteria for a 12-month mental disorder according to the criteria of the DSM-III, revised (DSM-III-R).[4] A fourth of these patients received treatment. Roughly half those who received treatment did not meet the criteria for a 12-month mental disorder according to the NCS or the DSM-III-R.

The results of the ECA study and the NCS are no longer valid owing to changes in the delivery of mental health care. The Substance Abuse and Mental Health Services Administration found that annual visits to mental health specialists (i.e., psychiatrists and psychologists) increased by 50 percent between 1992 and 2000.[5] The National Ambulatory Medical Care Survey found that the number of people receiving treatment for depression tripled between 1987 and 1997.[6] The Robert Wood Johnson Foundation Community Tracking Survey found that the number of people with a serious mental illness who were treated by a specialist increased by 20 percent between 1997 and 2001.[7]

The aim of our study was to present more comprehensive data on national trends with regard to the prevalence and rate of treatment of 12-month mental disorders based on the NCS, conducted from 1990 to 1992,[4] and the NCS Replication (NCS-R), conducted from 2001 to 2003.[8] In our study, unlike the study by the Substance Abuse and Mental Health Services Administration and the National Ambulatory Medical Care Survey, we examined data on the rate of treatment inside and outside the health care system. Unlike the Community Tracking Survey, which contained only rough data based on screening measures of prevalence, our study analyzed detailed diagnostic assessments.

## METHODS

### SAMPLES

The NCS and NCS-R are nationally representative, face-to-face household surveys of respondents 15 to 54 years of age (NCS) or 18 years of age and older (NCS-R). In the NCS, the response rate was 82.4 percent, and the total number of completed interviews was 8098; in the NCS-R, the response rate was 70.9 percent, and the total number of completed interviews was 9282.[4,8] All respondents had a diagnostic interview that focused on mental disorders. Respondents who had received a diagnosis of a mental disorder and a randomly selected subgroup of those who did not were interviewed to assess risk factors, treatment, and consequences of having a mental disorder. Weights were used to adjust for bias due to differences in responses and within-household differences in the probability of selection. Residual discrepancies between data from the U.S. Census and data on our sample with regard to demographic and geographic distributions were corrected with a final weight. A detailed discussion of samples and weights has been presented elsewhere.[4,8] The data presented in this report are from the part II assessment of respondents in the overlapping age range of the two samples (among respondents 18 to 54 years old, 5388 completed interviews in the NCS, and 4319 in the NCS-R).

### RECRUITMENT AND CONSENT

Introductory explanatory materials that were mailed to households included the NCS and NCS-R survey samples before an interviewer visited to answer any remaining questions respondents might have and to obtain informed consent and schedule interviews. As an incentive to respond, respondents included in the NCS received $25 and those included in the NCS-R received $50. A subgroup of those who did not initially agree to be interviewed received higher incentives ($50 in the NCS, and $100 in the NCS-R) to encourage them to complete a screening interview. The human-subjects committees of the University of Michigan and Harvard Medical School approved these procedures.

### DIAGNOSTIC ASSESSMENT

Diagnosis was based on the World Health Organization's Composite International Diagnostic Interview (CIDI) in conjunction with the DSM-III-R in the

NCS[9] and CIDI in conjunction with the fourth edition of DSM (DSM-IV) in the NCS-R.[10] Diagnoses included anxiety disorders (e.g., panic disorder, generalized anxiety disorder, phobias, and post-traumatic stress disorder), mood disorders (e.g., major depression, dysthymia, and bipolar disorder), and substance-abuse disorders (e.g., alcohol and drug abuse and dependence). Interviews conducted for clinical reappraisal documented good concordance and conservative estimates of prevalence, as compared with diagnoses made by clinicians who were unaware of the responses given in the diagnostic interview.[11,12] Twelve-month disorders were considered to be present if they had occurred at any time during the 12 months before the interview, even if the disorders had subsequently remitted with treatment.

Because the criteria of the DSM-III-R and of the DSM-IV differ too greatly to justify direct comparisons of prevalence in the data from the NCS and NCS-R, the trend analysis was based on a recalibration of both surveys according to a summary rating of severity that was developed for the NCS-R and then applied (imputed) to the data from the NCS. This rating has been described in detail elsewhere.[13] In brief, a serious disorder was defined as either one that met the 12-month criteria for schizophrenia, any other nonaffective psychosis, bipolar I disorder or bipolar II disorder, or substance dependence with a syndrome of physiological dependence, a suicide attempt or having a suicide plan in conjunction with a diagnosis of a disorder according to the criteria of the NCS-R and DSM-IV, a self-report of "severe" impairment in role functioning in two or more areas owing to a mental disorder, or a self-reported functional impairment associated with a mental disorder consistent with a score of 50 or less according to the Global Assessment of Functioning Scale (scores range from 0 to 100, with higher scores indicating better functioning).[14] A mental disorder that did not meet the criteria for a serious disorder was classified as a moderate or mild disorder on the basis of the subject's responses to disorder-specific questions on the Sheehan Disability Scales for the assessment of clinical severity.[15]

The imputation of scores for severity of disorder to cases included in the NCS was based on estimates calculated with the use of logistic-regression equations in the NCS-R in which symptom measures available in both surveys were used to predict the presence of a serious disorder in one respondent as compared with all other respondents, a serious-to-moderate disorder as compared with mild disorders in all other respondents, and the presence of any disorder as compared with no disorder. The accuracy of prediction was good with all three equations (area under the curve, 0.7 for a serious disorder, 0.8 for a serious-to-moderate disorder, and 0.8 for any disorder). The coefficients in these equations were used to generate predicted probabilities for each respondent included in both surveys for each nested outcome, and these probabilities, in turn, were used to impute discrete scores on the scale for severity (with a range from none to serious).

### TREATMENT

All respondents who were interviewed to assess risk factors in both surveys were asked whether they had sought treatment for an emotional disorder within the 12 months before the interview from a list of providers and settings. Responses were classified according to the providers in the sector of mental health services — psychiatrist, other mental health specialist, general medical provider (e.g., a general medical doctor or a nurse practitioner), or complementary–alternative medical provider.

### ANALYSIS

Trends were assessed with the use of risk ratios, defined as the proportional increase in the prevalence in the NCS-R as compared with the NCS. Variation in trends among subgroups in the sample, which were defined according to sociodemographic characteristics, was assessed with the use of pooled logistic-regression analysis. Predictors included time, sociodemographic characteristics, and interactions between time and the sociodemographic characteristics. Trends in treatment were also assessed, as a function of the severity of the disorder. Standard errors were obtained with the use of the Taylor series linearization method.[16] Adjustment for imprecision in the imputed scores for severity was made with the use of the multiple-imputation method.[17] Ten independent pseudosamples were drawn from the original NCS-R sample for this purpose, with the use of predicted probabilities of severity that were converted into dichotomous case classifications on the basis of probability distributions. The pseudosamples were used to build uncertainty with regard to classification into the standard error of the estimate; this was done by defining the square of the standard error as the sum of the average design-adjusted coefficient-variance estimates within the 10 pseudosamples and the variance of the coefficients across these pseudo-

samples. Logistic-regression coefficients and standard errors were exponentiated to create odds ratios with 95 percent confidence intervals. The significance of sets of multiple predictors was evaluated with the Wald $\chi^2$ tests with the use of design-adjusted, multiply-imputed coefficient variance–covariance matrixes.

## RESULTS

### TRENDS IN PREVALENCE

The estimated prevalence of a 12-month mental disorder that met the criteria of the DSM-IV did not differ significantly between the surveys (29.4 percent between 1990 and 1992 and 30.5 percent between 2001 and 2003, P=0.52). There was no significant change in the prevalence of serious disorders (5.3 percent vs. 6.3 percent, P=0.27), moderate disorders (12.3 percent vs. 13.5 percent, P=0.30), or mild disorders (11.8 percent vs. 10.8 percent, P=0.37), and no statistically significant interactions between time and sociodemographic characteristics in the prediction of prevalence (data not shown).

### TRENDS IN TREATMENT

The prevalence of treatment for an emotional disorder within the 12 months before the interview was 12.2 percent between 1990 and 1992 and 20.1 percent between 2001 and 2003 (risk ratio, 1.65, P<0.001) (Table 1). The association between greater severity and receipt of treatment was positive, significant (P<0.001), and did not differ over time. It was substantively moderate in the pooled data, however, calculated with the use of a Pearson's contingency coefficient (a polychotomous extension of the phi coefficeint of 0.14). Only a minority of respondents with a serious mental disorder received treatment (24.3 percent between 1990 and 1992 and 40.5 percent between 2001 and 2003). Approximately half those who received treatment (49.0 percent between 1990 and 1992 and 49.9 percent between 2001 and 2003) had none of the disorders considered here (Table 1).

The trends in the rate of treatment according to the sectors of mental health services were similar to the overall trends in two respects (Table 1). First, the severity of a disorder was significantly related to the rate of treatment (P<0.001), and second, this association did not change significantly over time. A significant difference in these trends was found among sectors (P<0.001). In the sector of general medical services, the rate of treatment increased from 3.9 percent to 10.0 percent (risk ratio, 2.59), in that of psychiatry services it increased from 2.4 percent to 5.2 percent (risk ratio, 2.17), and in the sector of other mental health services it increased from 5.3 percent to 8.4 percent (risk ratio, 1.59). In the sector of human services, it increased from 2.6 percent to 3.5 percent (risk ratio, 1.32; P=0.07), the rate in the sector of complementary–alternative medical services decreased from 3.3 percent to 2.7 percent (risk ratio, 0.81; P=0.07).

A shift in the distribution of treatment among the sectors occurred because of differences within the sectors. The distribution of treatment in the sector of general medical services increased from 31.5 percent to 49.6 percent (P<0.001), in that of psychiatry services from 19.6 percent to 25.8 percent (P=0.007), in that of other mental health services from 43.5 percent to 41.9 percent (P=0.59), in that of human services from 21.5 percent to 17.2 percent (P=0.11), and in that of complementary–alternative medical services from 26.8 percent to 13.2 percent (P<0.001). The changes in distribution did not vary significantly according to severity of disorder.

### SOCIODEMOGRAPHIC VARIABLES AND TREATMENT

We examined associations between seven sociodemographic variables and the measures of the six sectors in which treatment was provided (Table 2). Of the 42 associations, 10 were found to be significant with the use of a threshold of 0.001 as an approximate control for type 1 error. Predictors of the receipt of treatment within any sector of mental health services included age greater than 24 years, female sex, non-Hispanic white race, and marital status (separated, widowed, divorced, or never married). Race was self-reported. Predictors of treatment specific to the sector of services included age (older age correlated positively with treatment in the sector of general medical services and negatively with that of other mental health services), sex (female sex correlated positively with treatment in the sector of general medical services and negatively with that of complementary–alternative medical services), marital status (respondents who had never married were more likely than those who were currently married to receive treatment in the sector of other mental health services), education (more years of education correlated negatively with treatment in the sector of general medical services), and urban as compared with rural area (rural areas related negatively to sector of services). These associ-

**Table 1.** Treatment of 12-Month Disorders According to Severity and Sector of Mental Health Services among 5388 Respondents to the National Comorbidity Survey (NCS), 1990–1992, and 4319 Respondents to the National Comorbidity Survey Replication (NCS-R), 2001–2003.*

| Variable | Any | PSY | OMH | GM | HS | CAM |
|---|---|---|---|---|---|---|
| | | | *percentage ±SE†* | | | |
| **NCS** | | | | | | |
| Serious | 24.3±3.8 | 7.3±2.2 | 11.4±2.5 | 8.2±3.0 | 4.5±1.9 | 8.4±1.9 |
| Moderate | 25.4±2.4 | 5.8±1.2 | 13.6±1.6 | 8.6±1.4 | 5.5±1.1 | 7.1±1.2 |
| Mild | 13.3±2.4 | 2.5±1.2 | 4.9±1.3 | 4.3±1.4 | 3.0±1.2 | 3.0±0.8 |
| Any | 20.3±1.5 | 4.8±0.8 | 9.7±1.0 | 6.8±1.0 | 4.3±0.7 | 5.7±0.7 |
| None | 8.8±0.7 | 1.4±0.3 | 3.5±0.4 | 2.6±0.4 | 1.9±0.3 | 2.3±0.3 |
| Total | 12.2±0.6 | 2.4±0.3 | 5.3±0.3 | 3.9±0.4 | 2.6±0.3 | 3.3±0.3 |
| **NCS-R** | | | | | | |
| Serious | 40.5±4.7 | 14.4±3.3 | 19.4±3.5 | 22.1±3.5 | 6.5±1.6 | 6.2±1.5 |
| Moderate | 37.2±3.0 | 13.0±1.6 | 15.8±1.8 | 19.5±2.4 | 5.5±1.2 | 4.6±1.0 |
| Mild | 23.0±3.8 | 5.1±1.3 | 9.0±2.2 | 11.8±2.9 | 3.9±1.5 | 2.9±0.9 |
| Any | 32.9±2.0 | 10.5±1.0 | 14.1±1.3 | 17.3±1.3 | 5.1±0.8 | 4.3±0.6 |
| None | 14.5±0.9 | 2.9±0.4 | 5.9±0.6 | 6.8±0.6 | 2.7±0.4 | 1.9±0.3 |
| Total | 20.1±0.8 | 5.2±0.3 | 8.4±0.5 | 10.0±0.5 | 3.5±0.3 | 2.7±0.3 |
| | | | *risk ratio ±SE‡* | | | |
| **Ratio of NCS-R to NCS** | | | | | | |
| Serious | 1.68±0.35 | 2.01±0.84 | 1.72±0.49 | 2.91±1.33 | 1.53±0.70 | 0.74±0.25 |
| Moderate | 1.47±0.19§ | 2.27±0.57§ | 1.17±0.19 | 2.29±0.46§ | 1.01±0.29 | 0.65±0.17 |
| Mild | 1.74±0.35§ | 2.17±1.14 | 1.85±0.57 | 2.82±1.04 | 1.34±0.64 | 0.97±0.38 |
| Any | 1.62±0.15§ | 2.21±0.40§ | 1.46±0.18§ | 2.58±0.41§ | 1.19±0.25 | 0.76±0.14 |
| None | 1.65±0.16§ | 2.05±0.50§ | 1.71±0.26§ | 2.57±0.46§ | 1.42±0.32 | 0.86±0.16 |
| Total | 1.65±0.10§ | 2.17±0.27§ | 1.59±0.15§ | 2.59±0.29§ | 1.32±0.19 | 0.81±0.10 |
| | $\chi^2$  P Value | $\chi^2$  P Value | $\chi^2$  P Value | $\chi^2$  P Value | $\chi^2$  P Value | $\chi^2$  P Value |
| **Statistical significance¶** | | | | | | |
| Severity | 194.6  <0.001 | 112.2  <0.001 | 118.1  <0.001 | 105.3  <0.001 | 23.0  <0.001 | 82.9  <0.001 |
| Time | 56.8  <0.001 | 34.5  <0.001 | 22.7  <0.001 | 72.4  <0.001 | 3.3  0.07 | 3.3  0.07 |
| Time-by-severity | 0.5  0.93 | 0.2  0.98 | 3.0  0.40 | 0.3  0.96 | 0.9  0.82 | 1.2  0.76 |

* Mental disorders were diagnosed according to the criteria of the DSM-IV. Respondents in both surveys were 18 through 54 years of age. Any denotes any sector of mental health services, PSY the sector of psychiatry services, OMH other mental health services, GM general medical services, HS human services, CAM complementary–alternative medical services, and $\chi^2$ the Wald $\chi^2$ test. Standard errors (SEs) are the design-based multiply-imputed standard errors of the estimated values.

† Percentages are the proportions of respondents in the total sample who received any treatment or treatment within the indicated sector of mental health services.

‡ The risk ratio is not always equal to the ratio of the estimated percentages, because of the use of the multiple-imputation method.

§ P values of less than 0.05 (in a two-sided test) indicate statistical significance.

¶ Each $\chi^2$ test for severity has 3 degrees of freedom. Each $\chi^2$ test for time has 1 degree of freedom. Significance tests for interactions between time and severity evaluate the significance of changes between the two surveys. Each time-by-severity $\chi^2$ test has 3 degrees of freedom.

ations are all moderate in magnitude (Pearson's contingency coefficient, 0.04 to 0.07). Income was the only sociodemographic variable that was not significantly related to treatment in any sector of mental health services. Interactions with time and severity of disorder were shown to be nonsignificant with the use of a threshold of 0.001 (Table 2).

## DISCUSSION

Although there are limitations to our study, there were five important results. First, no notable change occurred in the prevalence or severity of mental disorders in the United States between 1990 and 1992 or between 2001 and 2003. There are two

**Table 2.** Sociodemographic Characteristics That Were Predictors of the Receipt of Treatment for Any 12-Month Mental Disorder in the Total Sample of 9707 Respondents and as a Proportion of Treatment Provided in All Sectors of Services.*

| Characteristic | Any | PSY | OMH | GM | HS | CAM |
|---|---|---|---|---|---|---|
| | | | *odds ratio (95 percent confidence interval)* | | | |
| **Age group** | | | | | | |
| 18–24 yr | 0.6 (0.5–0.8)† | 0.6 (0.4–1.0) | 2.6 (1.7–3.9)† | 0.4 (0.3–0.6)† | 2.1 (1.2–3.8)† | 0.9 (0.6–1.5) |
| 25–34 yr | 0.9 (0.7–1.1) | 0.6 (0.4–0.8)† | 1.9 (1.3–2.6)† | 0.6 (0.4–0.8)† | 1.5 (0.9–2.6) | 1.2 (0.8–1.7) |
| 35–44 yr | 1.1 (0.9–1.4) | 0.7 (0.5–0.9)† | 1.7 (1.3–2.3)† | 0.8 (0.6–1.1) | 1.3 (0.8–2.2) | 1.1 (0.8–1.5) |
| 45–54 yr‡ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| P value | <0.001 | 0.007 | <0.001 | <0.001 | 0.07 | 0.70 |
| **Sex** | | | | | | |
| Female | 1.7 (1.4–1.9)† | 0.7 (0.6–0.9)† | 1.0 (0.8–1.2) | 1.8 (1.4–2.3)† | 1.1 (0.8–1.5) | 0.7 (0.5–0.8) |
| Male‡ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| P value | <0.001 | 0.01 | 0.71 | 0.001 | 0.69 | <0.001 |
| **Race or ethnic group§** | | | | | | |
| Hispanic | 0.6 (0.5–0.9)† | 0.5 (0.3–0.8)† | 1.0 (0.6–1.6) | 0.8 (0.5–1.2) | 1.5 (0.8–2.7) | 0.8 (0.4–1.4) |
| Non-Hispanic black | 0.5 (0.4–0.7)† | 0.9 (0.6–1.5) | 0.7 (0.5–1.1) | 0.5 (0.5–1.4) | 1.9 (1.2–3.0)† | 0.6 (0.4–1.0) |
| Other | 0.5 (0.4–0.7)† | 0.9 (0.5–1.7) | 1.0 (0.4–2.5) | 0.8 (0.2–2.6) | 0.7 (0.3–1.9) | 0.7 (0.3–1.5) |
| Non-Hispanic white‡ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| P value | <0.001 | 0.02 | 0.47 | 0.68 | 0.01 | 0.22 |
| **Marital status** | | | | | | |
| Separated, widowed, or divorced | 1.8 (1.5–2.2)† | 1.0 (0.7–1.3) | 1.8 (1.4–2.5)† | 0.6 (0.4–0.8)† | 1.3 (0.8–2.1) | 1.5 (1.0–2.3) |
| Never married | 1.3 (1.1–1.6)† | 1.2 (0.8–1.6) | 1.3 (1.0–1.8)† | 0.8 (0.5–1.1) | 1.0 (0.6–1.6) | 0.9 (0.6–1.4) |
| Married‡ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| P value | <0.001 | 0.59 | <0.001 | 0.003 | 0.39 | 0.05 |
| **Education** | | | | | | |
| 0–11 yr | 1.1 (0.8–1.5) | 0.9 (0.6–1.3) | 0.6 (0.4–0.9)† | 2.6 (1.7–4.1)† | 0.4 (0.2–0.8)† | 1.1 (0.7–1.8) |
| 12 yr | 1.0 (0.8–1.3) | 0.8 (0.6–1.2) | 0.6 (0.4–0.9)† | 2.2 (1.5–3.2)† | 0.8 (0.5–1.2) | 1.0 (0.7–1.5) |
| 13–15 yr | 1.2 (0.9–1.4) | 0.7 (0.5–0.9)† | 0.8 (0.6–1.0) | 2.1 (1.4–3.1)† | 0.8 (0.5–1.2) | 0.8 (0.6–1.2) |
| ≥16 yr‡ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| P value | 0.32 | 0.04 | 0.02 | <0.001 | 0.03 | 0.48 |

possible explanations for this result: that the prevalence of mental disorders would have been higher in the early 2000s than in the early 1990s were it not for the increase in the rate of treatment, and that this increase did not result in a decrease in the number and type of disorders. Consistent with the first possibility is the fact that an economic recession began shortly before and deepened throughout the field-study period of the NCS-R, even though the attacks on September 11, 2001, occurred in the middle of the field-study period. The prevalence of mental disorders might have increased in the absence of an increase in the rate of treatment. However, there is more evidence that is consistent with the second explanation. Studies show that most treatment for mental disorders falls below the minimal standards of quality.[18] In addition, such treatment is typically brief, which means that treatment would influence the duration of an episode of mental disorder more than it would the prevalence of mental disorders in the 12 months before the interview.

Finally, the increase in the rate of treatment was largely in the sector of general medical services, and treatment was provided to patients without disorders that were classified according to criteria of the NCS-R and DSM-IV. Controlled treatment trials have provided no evidence that pharmacotherapy significantly improves mild disorders, making it unlikely that pharmacotherapy could prevent

| Table 2. (Continued.)* | | | | | | |
|---|---|---|---|---|---|---|
| Characteristic | Any | PSY | OMH | GM | HS | CAM |
| | *odds ratio (95 percent confidence interval)* | | | | | |
| Income¶ | | | | | | |
| Low | 1.1 (0.8–1.4) | 1.2 (0.8–1.9) | 1.0 (0.7–1.6) | 0.9 (0.5–1.4) | 2.1 (1.1–3.8)† | 1.4 (0.9–2.2) |
| Low-average | 0.9 (0.7–1.1) | 0.9 (0.6–1.4) | 1.0 (0.7–1.4) | 1.2 (0.8–1.8) | 1.9 (1.1–3.2)† | 1.6 (1.1–2.5)† |
| High-average | 0.9 (0.7–1.1) | 0.8 (0.5–1.2) | 0.9 (0.7–1.3) | 1.1 (0.8–1.6) | 1.6 (1.0–2.7)† | 1.5 (1.0–2.1) |
| High‡ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| P value | 0.25 | 0.07 | 0.94 | 0.21 | 0.10 | 0.08 |
| Urban vs. rural area‖ | | | | | | |
| Large MSA–central city | 1.6 (0.9–2.6) | 0.8 (0.3–2.1) | 3.2 (1.3–7.6) | 0.7 (0.3–1.4) | 0.3 (0.1–0.7) | 2.9 (1.0–8.4)† |
| Large MSA–suburb | 1.5 (0.9–2.4) | 0.7 (0.2–2.0) | 3.0 (1.3–7.2) | 0.7 (0.4–1.4) | 0.5 (0.2–1.1) | 2.6 (0.9–7.3) |
| Small MSA–central city | 1.5 (0.9–2.4) | 0.5 (0.2–1.4) | 4.0 (1.7–9.4) | 1.0 (0.5–1.9) | 0.4 (0.2–0.9)† | 1.9 (0.7–5.6) |
| Small MSA–suburb | 1.4 (0.8–2.4) | 0.5 (0.2–1.4) | 3.2 (1.4–7.4) | 1.1 (0.6–2.0) | 0.5 (0.2–1.1) | 1.6 (0.6–4.4) |
| Adjacent area | 1.2 (0.8–1.9) | 0.6 (0.2–1.6) | 3.6 (1.5–8.6) | 1.1 (0.5–1.7) | 0.5 (0.2–1.1) | 2.0 (0.8–5.2) |
| Rural area‡ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| P value | 0.35 | 0.23 | 0.06 | 0.36 | 0.10 | 0.006 |

* Odds ratios have been adjusted for the severity of the disorder and for the time period. Any denotes any sector of mental health services, PSY psychiatry services, OMH other mental health services, GM general medical services, HS human services, and CAM complementary–alternative medical services.
† P values of less than 0.05 (in a two-sided test) indicate statistical significance.
‡ Respondents in this category served as the reference group.
§ Race was self-reported.
¶ Income was defined as a multiple of the federal poverty line (for 1990 in the NCS and for 2001 in the NCS-R) for a family with the same composition as that of the respondent: low denotes a ratio of income to poverty (I:P) of less than 1.5:1, low-average an I:P between 1.5:1 and <3:1, high-average an I:P between 3:1 and <6:1, and high an I:P of ≥6:1.
‖ Urban vs. rural area was coded according to the definitions of the U.S. Census Bureau for 1990 (NCS) and 2000 (NCS-R) to distinguish between large metropolitan statistical areas (MSAs) (at least 2 million residents) and smaller MSAs (<2 million) and between central cities and the suburbs of such cities.

a significant increase over time in the prevalence of such disorders.

Second, a substantial increase in the rate of treatment occurred between 1990 to 1992 and 2001 to 2003 in the proportion of the population treated for emotional disorders, even though the majority of those with such disorders still received no treatment. The increased rate of treatment may have been due to aggressive, direct-to-consumer marketing of new psychotropic medications[19]; the development of new community programs to promote the awareness of mental disorders and provide screening and help in seeking care[20]; the expansion of primary care, managed care, and behavioral "carve-out" programs of mental health services[21]; and new legislation and policies to promote access to these services.[22] Presumably, increased access played an independent role in the increase in the proportion of the population treated for emotional disorders.[23] Insurance coverage expanded throughout the decade, whereas cost sharing by consumers declined.

Third, the increase in the rate of treatment varied among the sectors of mental health services, leading to a shift in the type of treatment, most notably an increase of more than 150 percent in the rate of treatment in the sector of general medical services. Despite the hope that mental disorders might be treated more efficiently owing to this shift, the data show that many patients receiving treatment in this sector of services did not complete the clinical assessment or receive treatment or the appropriate ongoing monitoring in accordance with accepted standards of care.[18] In addition, a high proportion of patients continued to receive treatment provided in the sectors of human services and complementary–alternative medical services for which rigorous evidence of effectiveness is lacking.

Fourth, the increase in the rate of treatment was

unrelated to sociodemographic variables. As a result, the increase did not reduce the sociodemographic differences shown in the baseline NCS.[24] Indeed, in absolute terms, these inequalities increased. For example, in both the NCS and the NCS-R, among non-Hispanic blacks and whites, blacks were only 50 percent as likely to receive psychiatric treatment as whites when both received a diagnosis of a disorder of the same severity, but the fact that the rate of psychiatric treatment increased by more than 100 percent suggests that this difference resulted in an absolute gap in the receipt of treatment between non-Hispanic blacks and whites that increased by more than 100 percent.

Fifth, although a small positive association was found in both surveys between the severity of the disorder and the receipt of treatment, severity did not interact with time in predicting receipt of treatment. Thus, the proportional increase in the rate of treatment was essentially the same for all levels of severity. The positive association between severity and treatment has been interpreted as evidence of rationality in the distribution of treatment resources.[24] However, the fact that in roughly half the respondents who received treatment, the mental disorder did not meet the criteria of the DSM for any disorder assessed in the NCS and NCS-R has led to controversy with regard to the relationship between severity and the need for treatment.[25,26] Some commentators have argued that treatment resources should be focused on serious disorders.[27] Others have argued that the treatment of mild disorders[28] and subthreshold syndromes[29] might be cost-effective and might prevent the onset of serious disorders in the future. No comparative data on cost-effectiveness are available to use in considering these contending views.

Two limitations of the study need to be noted. First, severity was assessed indirectly between 1990 and 1992 with the use of imputation, and second, the adequacy of treatment was not assessed. Both the strong relationship of imputed values to direct measures of severity in the NCS-R and the use of the multiple-imputation method to adjust for the increase in error variance when testing for significance tend to minimize concern with regard to the first limitation. The second limitation is of more concern, because research has shown that many patients with a mental disorder receive inadequate treatment.[18] We were unable to study the adequacy of treatment, however, because the information on processes of care in the NCS was insufficient for such an analysis.

Our data suggest two directions for future research and policy analysis. First, because most people with a mental disorder do not receive treatment, efforts are needed to increase access to and demand for treatment. The persistence of low rates of treatment among traditionally underserved groups calls for special initiatives.[30] The Surgeon General's report on undertreatment among racial and ethnic groups[1] and the National Institute of Mental Health initiative with regard to undertreatment among men[31] may provide useful models that should be evaluated. Programs to expand resources for treatment in targeted locations might also be of value,[32] as might initiatives such as legislation to encourage the use of mental health services by vulnerable elderly patients.[22] Efforts are also needed to evaluate widely used treatments for which there are as yet no data on effectiveness and to increase the use of evidence-based treatments. The expansion of disease-management programs, quality-assurance programs for treatment, and the use of "report cards" are important steps in this direction. Substantial barriers continue to exist, however, including competing clinical demands and distorted treatment incentives.[33,34] Initiatives aimed at overcoming these barriers are under way.[35,36] Future surveys of trends in the prevalence and treatment of mental disorders need to include data on treatment processes, such as those in the NCS-R, to permit changes in the quality of treatment to be tracked.

## APPENDIX

In addition to the authors, the following were collaborating investigators: K. Merikangas (co-principal investigator, NIMH), J. Anthony (Michigan State University), W. Eaton (Johns Hopkins University), M. Glantz (NIDA), D. Koretz (Harvard University), J. McLeod (Indiana University), G. Simon (Group Health Cooperative Health Care System), M. Von Korff (Group Health Cooperative Health Care System), E. Wethington (Cornell University), and H.-U. Wittchen (Max Planck Institute of Psychiatry).

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