

Patterns and Predictors of Treatment Seeking After Onset of a Substance Use Disorder

Ronald C. Kessler, PhD; Sergio Aguilar-Gaxiola, MD, PhD; Patricia A. Berglund, MBA; Jorge J. Caraveo-Anduaga, MD, MPH; David J. DeWit, PhD; Shelly F. Greenfield, MD, MPH; Bohdan Kolody, PhD; Mark Olfson, MD, MPH; William A. Vega, PhD

Background: We studied survey respondents aged 18 through 54 years to determine consistent predictors of treatment seeking after onset of a DSM-III-R substance use disorder.

Methods: Survey populations included a regional sample in Ontario (n=6261), a national sample in the United States (n=5388), and local samples in Fresno, Calif (n=2874) and Mexico City, Mexico (n=1734). The analysis examined the effects of demographics, symptoms, and types of substances on treatment seeking.

Results: Between 50% (Ontario) and 85% (Fresno) of people with substance use disorders seek treatment but the time lag between onset and treatment seeking averages a decade or more. Consistent predictors of treatment seeking include: (1) late onset of disorder (odds ratio [OR], 3.8; 95% confidence interval [CI], 2.6-5.6 for late [≥ 30 years] vs early [1-15 years] age at first symptom of disorder); (2) recency of cohort (OR, 3.4; 95%

CI, 2.3-5.0 for most recent [aged 15-24 years at interview] vs earliest [aged ≥ 45 years] cohorts); (3) 4 specific dependence symptoms (using larger amounts than intended, unsuccessful attempts to cut down use, tolerance, and withdrawal symptoms), with ORs ranging between 1.6 (95% CI, 1.3-2.0) and 2.7 (95% CI, 2.1-3.6) for people with vs without these symptoms; and (4) use vs nonuse of cocaine (OR, 2.1; 95% CI, 1.6-2.7) and heroin (OR, 2.6; 95% CI, 1.1-6.0).

Conclusions: Although most people with substance use disorders eventually seek treatment, treatment seeking often occurs a decade or more after the onset of symptoms of disorder. While treatment seeking has increased in recent years, it is not clear whether this is because of increased access, increased demand, increased societal pressures, or other factors.

Arch Gen Psychiatry. 2001;58:1065-1071

PREVIOUS RESEARCH on treatment seeking for substance use disorders has demonstrated effects of clinical,¹ demographic,² attitudinal,^{3,4} cultural,⁵ and social^{6,7} factors. Several studies have also shown that the severity of substance dependence⁸⁻¹⁰ and the severity of substance-related adverse consequences^{2,6,10} are associated with treatment seeking. However, these studies have generally focused on a single substance of use and have followed up with prevalent cases for short periods (typically 1 year or less). Much less is known about treatment seeking among incident cases during longer periods using a wide range of substances. Our report presents data based on 4 population surveys, including 1 from Canada, 2 from the United States, and 1 from Mexico. The 4 surveys were designed in parallel to facilitate the search for consistent patterns and predictors. The focus of our report is on the effects of age at onset, sex,

cohort, severity of disorder, and types of substances used on the odds of initial treatment seeking among incident cases of substance abuse and dependence.

Three issues are considered. First, we examined the cumulative probabilities of lifetime treatment seeking for substance use disorders in each survey. Based on previous research,¹¹⁻¹³ we hypothesized that most people with substance use disorders would eventually seek treatment but that delays would be common. Second, we evaluated whether treatment seeking is associated with age at onset, sex, and cohort. Consistent with similar previous research, we hypothesized that treatment seeking would be more likely among people with early-onset than with later-onset disorders and among people in recent cohorts vs earlier cohorts. Because the literature is inconsistent regarding the effect of sex on treatment seeking,^{14,15} we had no hypothesis about whether men and women would differ in treatment seeking. Third, previous

Affiliations are listed in the acknowledgment section on page 1070.

METHODS

SAMPLES

All 4 surveys were carried out in multistage clustered area probability household samples. Face-to-face interviews were administered to 1 randomly selected respondent in each household. Respondents were aged 18 to 54 years. The surveys included: (1) the Mental Health Supplement to the Ontario Health Survey, a survey of 6261 respondents in Ontario, Canada, carried out in 1990-1991 (67% response rate)¹⁶; (2) the National Comorbidity Survey (NCS), a national survey of 5388 respondents in the coterminous United States, carried out in 1990-1992 (82% response rate)¹⁷; (3) the Mexican-American Prevalence and Services Survey, a county-level survey of 2875 respondents of Mexican origin in Fresno County, Calif, carried out in 1995-1996 (90% conditional response rate in successfully screened households known to contain Mexican-born residents)¹⁸; and (4) the Epidemiology of Psychiatric Comorbidity Survey, a survey of 1734 residents of one catchment area in Mexico City, Mexico, carried out in 1995 (60% response rate).¹⁹ The data in all 4 surveys were weighted to adjust for differences in within-household probabilities of selection and to adjust the sample distributions to the census distributions on a wide range of sociodemographic variables. More detailed discussions of sample designs and sociodemographic distributions are presented elsewhere.²⁰

INTERVIEWERS

The US and Ontario lay interviewers were experienced professionals who worked for the Survey Research Center at the University of Michigan (Ann Arbor) and for Statistics Canada (Ottawa, Ontario) (the Canadian equivalent of the

US Census Bureau), respectively. The Mexico City and Fresno interviewers were hired specifically for this survey. The interviewers in all 4 surveys completed a 40-hour study-specific interviewer training course and successfully administered a series of supervised test interviews before beginning work on the survey.

DIAGNOSTIC ASSESSMENT

The *DSM-III-R*²¹ diagnoses of alcohol and drug abuse and dependence were generated from a modified version of the Composite International Diagnostic Interview²² developed for the NCS.²³ The Composite International Diagnostic Interview is a fully structured diagnostic interview designed to be used by trained interviewers who are not clinicians. Both World Health Organization field trials²⁴ and an NCS clinical reappraisal study²⁵ documented acceptable reliability and validity of these diagnoses.

Nine types of substances were assessed in the surveys: alcohol, prescription sedatives, prescription stimulants, inhalants, marijuana, psychedelics, cocaine, opiates, and heroin. Respondents were asked whether they had ever met each of the *DSM-III-R* Criterion A symptoms of dependence for each of the substances used (at least 5 times) and to retrospectively report their ages at the onset of each of the 81 symptom-substance combinations endorsed. These reports were used to estimate lifetime prevalences and ages at onset. The analysis reported here is confined to the 3467 respondents of the total 16 257 (the 4 surveys combined) who met lifetime criteria for abuse or dependence. Age at onset is defined as the age at which the respondent reported his or her first *DSM-III-R* Criterion A symptom of abuse or dependence to have occurred. In most cases, this corresponds to the age at onset of alcohol abuse. The mean (SD) and median amounts of time between retrospectively reported age at onset of

studies have shown that severity of dependence is related to treatment seeking.⁸⁻¹⁰ We consequently hypothesized that treatment seeking would be more likely among people with dependence than with abuse. We also evaluated whether the odds of treatment seeking are related to the type of substance used.

RESULTS

LIFETIME PREVALENCES OF SUBSTANCE USE DISORDERS AND TREATMENT SEEKING

The proportion (SE) of respondents in the surveys who met *DSM-III-R* criteria for lifetime substance abuse or dependence (**Table 1**) varied from a high of 28.2% (0.9%) in the United States to a low of 10.6% (0.9%) in Mexico City. The proportion (SE) who reported ever seeking treatment for their substance problems varied from a high of 47.9% (3.8%) in Fresno to a low of 24.8% (3.4%) in Mexico City.

CUMULATIVE LIFETIME PROBABILITIES OF TREATMENT SEEKING

Kaplan-Meier curves (**Figure**) show that most people with substance use disorders eventually seek treatment (50%

in Ontario, 60% in Mexico City, 72% in the United States, and 85% in Fresno). These proportions are uniformly higher than the proportions of lifetime treatment seeking reported in Table 1 because Table 1 reports treatment seeking to date, while the Figure includes projections of anticipated future treatment seeking. The median time between onset of symptoms and initiation of treatment seeking is 10 years in Ontario, 13 in Fresno and Mexico City, and 16 in the United States.

THE EFFECTS OF AGE AT SYMPTOM ONSET, AGE AT INTERVIEW, SEX, AND TIME SINCE SYMPTOM ONSET

Survival models were estimated to evaluate the effects of age at symptom onset, age at interview, sex, and time since symptom onset to predict treatment seeking. Preliminary analysis showed that none of the survival coefficients differed significantly across surveys.³² Therefore, only pooled results are reported here. The survival coefficients from the additive model (**Table 2**) have been reparametrized and can be interpreted as odds ratios (ORs).

The first 4 rows of Table 2 show a significant inverse relationship between age at symptom onset and odds

symptoms and age at interview were 12.5 (7.3) years and 12 years, respectively, with an age range of 0 to 52 years.

TREATMENT SEEKING

Respondents with lifetime abuse or dependence were asked whether they had ever told a professional about their substance use problems or sought help at a self-help group. Positive responses were followed with probes to determine the age at which the respondent first told a professional or attended a self-help group meeting. These responses were combined to define the age at initial treatment seeking as the earliest age the respondent reported telling a professional or attending a self-help group meeting. The mean (SD) and median amounts of time between retrospectively reported age of first treatment seeking and age at interview were 7.8 (5.9) years and 6 years, respectively, with an age range of 0 to 37 years.

PREDICTOR VARIABLES

Discrete-time survival analysis, with person-year as the unit of analysis, was used to study the predictors of treatment seeking. Two time-related sets of variables that are constants for an individual older than the ages represented in the survival analysis were included as predictors. The first set was a series of dummy variables to define age at onset of symptoms (ages 1-15, 16-20, 21-29, and ≥ 30 years). In most cases this corresponded to the age at which alcohol was first abused, although a small number of respondents reported using drugs earlier than alcohol. Since no effect on treatment seeking was found by distinguishing among types of substances first used, in the analysis reported below we focused on age at first use and ignored the type of substance first used. The second set of time-related predictors was a series of dummy

variables to distinguish age at interview (18-24, 25-34, 35-44, and 45-54 years).

In addition, 3 sets of predictors that take on different values for an individual at different times during an analysis were included. The first was the time since the onset of symptoms, created by subtracting age at symptom onset from age in each subsequent person-year and coded as dummy variables to distinguish 0 (age at onset), 1 through 4, 5 through 9, and 10 or more years since onset. The second set of time-varying predictors was a series of 9 dummy variables to describe which of the 9 substances the respondent ever used as of each year of observation. The third set was a series of 9 dummy variables to describe which of the 9 DSM-III-R Criterion A symptoms of dependence the respondent ever had as of each year of observation. Preliminary investigation failed to find statistically significant interactions between type of substance and type of symptom in predicting treatment seeking. As a result, these effects were evaluated in an additive prediction equation. Sex and country were also included as predictors.

ANALYSIS PROCEDURES

The Kaplan-Meier method²⁶ was used to generate a cumulative probability of a treatment seeking curve for respondents with lifetime substance use disorders starting at the age of symptom onset. Discrete-time survival analysis²⁷ with person-year as the unit of analysis was used to study the predictors of treatment seeking within and across surveys. Standard errors of parameter estimates were generated using the jackknife repeated replications procedure²⁸ to adjust for the weighting and clustering of observations. An SAS (SAS Institute, Cary, NC) macro²⁹⁻³¹ was written to operationalize the jackknife repeated replications procedure. Statistical significance was evaluated at the .05 level using 2-sided tests.

of treatment seeking. The next 4 rows show that the odds of seeking treatment in a given year are higher for the youngest respondents, controlling for age at symptom onset. Given that the prediction equation controls for person-year, the effect of age at interview is probably a cohort effect and will be referred to as such for the remainder of the article. The next 2 rows show that there is no meaningful sex difference. The next 4 rows follow the pattern seen in the Figure: that the odds of treatment seeking are somewhat greater in the year of onset of symptoms than in subsequent years. Another aspect of this progression that can be seen in Table 2 but not in the unadjusted rates used to compute the Figure is that the odds of treatment-seeking increase after the first decade of symptoms. The next 4 rows, finally, show that there is a significant between-country difference in the treatment-seeking net of the sociodemographic variables because of a lower odds in the Mexico City sample than the other samples.

A number of interaction models were investigated to determine whether the cohort effect observed in Table 2 varies systematically by the other predictors. A significant interaction between cohort and age at symptom onset was found in the United States ($\chi^2_9 = 18.7$; $P = .03$) and Fresno ($\chi^2_9 = 12.1$; $P = .21$). This occurs because treatment seeking is more likely among recent cohorts and

more so among respondents with the earliest ages at onset of symptoms. A significant interaction between cohort and sex was found in Fresno ($\chi^2_3 = 10.4$; $P = .02$). This is owing to a stronger cohort effect among women than men. A significant interaction between cohort and time since symptom onset was found in the United States ($\chi^2_9 = 18.4$; $P = .03$). This is caused by a stronger cohort effect in the first few years after symptom onset than in later years.

THE EFFECTS OF DSM-III-R SYMPTOMS AND TYPES OF SUBSTANCES USED

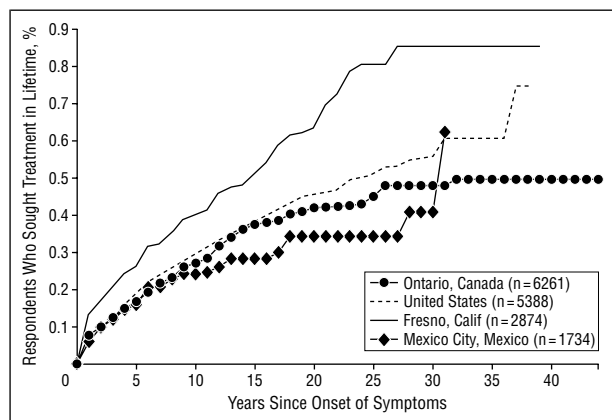
The results in **Table 3** show that, after adjusting for the effects documented in Table 2, there is significant variation in the pooled association between the 9 Criterion A symptoms of dependence and treatment seeking ($\chi^2_9 = 334.5$; $P < .001$). This variation is also significant in each of the 4 individual surveys (with χ^2_9 in the range of 32.5-470.9; $P < .001$). Four of the 9 criteria have significantly elevated ORs in the pooled data: using larger amounts or for longer periods than intended (DSM-III-R Criterion A1), unsuccessful attempts to cut down use (A2), tolerance (A7), and withdrawal symptoms (A8). Each of these symptoms is associated with an average in-

Table 1. Lifetime Prevalence of DSM-III-R Substance Use and Lifetime Treatment Seeking in the 4 Surveys*

Survey	No. of Respondents	Lifetime Substance Use	Lifetime Treatment Seeking Among Those With Substance Use
Ontario, Canada	6261	19.4 (0.7)	31.8 (2.0)
United States	5388	28.2 (0.9)	35.5 (1.1)
Fresno, Calif	2874	18.1 (1.0)	47.9 (3.8)
Mexico City, Mexico	1734	10.6 (0.9)	24.8 (3.4)
Total	16 257	21.5 (0.5)	35.5 (1.1)

*Data are given as percentage (SE) unless otherwise indicated.

†Sample sizes are unweighted numbers of respondents who participated in the surveys. Percentages are based on weighted data. SEs of percentage estimates are based on a design-based method, the jackknife repeated replications procedure, that takes into consideration the weighting and clustering of sample cases.



Time to initial treatment seeking after symptom onset in the 4 surveys. $\chi^2_3=26.2$.

crease in the odds of treatment seeking compared with people without the symptom (OR, 1.7-2.7). The ORs of these 4 significant symptoms do not differ significantly across the surveys (χ^2_3 range, 2.0-3.7; $P=.23-.57$). The residual between-country difference in treatment seeking, presented in the last 4 rows of Table 3, is no longer significant after adjusting for differences in symptom prevalences ($\chi^2_3=5.3$; $P=.15$).

After adjusting for the effects presented in Tables 2 and 3, there is significant variation (Table 4) in the pooled associations between the 9 types of substances and treatment seeking ($\chi^2_9=65.3$; $P<.001$). This variation is also significant in 3 of the 4 individual surveys (χ^2_9 range, 56.4-214.6; $P<.001$). The exception is Mexico City, where only 3 substances were reported to be used by a large enough number of respondents to be included in the analysis (alcohol, marijuana, and sedatives). No significant variation in the ORs among these 3 substances was found in any of the surveys (χ^2_2 range, 0.8-2.8; $P=.25-.67$). Cocaine and heroin have significantly elevated ORs in the pooled data, each associated with an OR of 2.2-2.7. These ORs do not differ significantly across the surveys (χ^2_2 range, 1.8-4.9; $P=.07-.41$). The residual between-country difference in treatment seeking remains nonsignificant after adjusting for differences in types of substances used ($\chi^2_3=3.4$; $P=.37$).

Table 2. Effects of Age at First Use, Age at Interview (Cohort), Sex, and Time Since Onset of Disorder in Predicting Treatment Seeking for Substance Use, 4 Surveys Combined*

	OR (95% CI)†	Significance of Between-Survey Differences	
		χ^2 †	df†
Age at first use, y			
1-15	1.0 . . .		
16-20	0.8 (0.7-1.0)		
21-29	1.9 (1.1-1.9)‡		
30-54	3.8 (7.6-56.0)‡		
χ^2_3	57.0‡	11	9
Age at interview (cohort), y			
18-24	3.4 (2.3-5.0)‡		
25-34	2.2 (1.6-2.9)‡		
35-44	1.5 (1.1-2.0)‡		
45-54	1.0 . . .		
χ^2_3	68.5‡	4.8	9
Sex			
Female	1.0 (0.8-1.2)		
Male	1.0 . . .		
χ^2_1	0.1	1.6	3
Time since symptom onset, y			
0	1.1 (0.8-1.5)		
1-4	0.5 (0.4-0.7)‡		
5-9	0.5 (0.4-0.7)‡		
≥ 10	1.0 . . .		
χ^2_3	45.8‡	10	9
Survey			
Ontario, Canada	0.9 (1.1-1.7)		
United States	1.0 . . .		
Fresno, Calif	1.4 (1.1-1.7)		
Mexico City, Mexico	0.6 (0.4-0.9)‡		

*OR indicates odds ratio; CI, confidence interval. Coefficients are based on a discrete-time survival equation with person-year as the unit of analysis. The analysis is based on 3467 respondents with lifetime substance abuse or dependence, 1230 of whom sought treatment. There were 31 459 person-years in the lives of these respondents beginning at the age of symptom onset and ending in either treatment seeking, remission of the disorder without treatment, or persistence of the untreated disorder at the time of interview. While sample sizes are unweighted numbers, the survival equation was estimated on weighted data. Significance tests are based on a design-based method, the jackknife repeated replications procedure, that takes into consideration the weighting and clustering of sample cases.

†Wald χ^2 test for difference in statistically significant ORs across surveys. ‡Significant at the .05 level, 2-sided test.

COMMENT

The results support all 3 initial hypotheses. (1) Most people with substance use disorders eventually seek treatment but long lag times until such action are the norm. (2) The odds of treatment seeking are positively related to the age at onset of disorder and are higher in successively more recent cohorts. (3) The rate of treatment seeking is higher among people with than without certain symptoms of dependence and among users than nonusers of cocaine and heroin. All of these results were confirmed in all 4 surveys.

As noted in the introduction, most research on barriers to treatment seeking for substance use disorders focuses on recent use of services among prevalent cases and finds low rates of service use.^{5,6,33} Our finding that most

Table 3. Effects of DSM-III-R Substance Use Disorder Symptoms in Predicting Initial Treatment Seeking, 4 Surveys Combined*

	OR (95% CI)†	Significance of Between-Survey Differences χ^2 ‡
<i>DSM-III-R symptoms</i>		
A1 Larger amounts/longer period	1.7 (1.4-2.1)‡	2.0
A2 Persistent desire/unsuccesful cut-down	1.7 (1.2-2.1)‡	2.3
A3 A lot of time spent obtaining, using, recovering	1.3 (1.0-1.6)	...
A4 Neglect role/hazardous use	1.2 (0.9-1.6)	...
A5 Give up activities	0.8 (0.6-1.0)	...
A6 Continued use despite problems	1.1 (0.8-1.5)	...
A7 Tolerance	1.6 (1.3-2.0)‡	2.5
A8 Withdrawal symptoms	2.7 (2.1-3.6)‡	3.7
A9 Withdrawal avoidance/relief	0.8 (0.5-1.3)	...
χ^2_9	334.5‡	
<i>Survey</i>		
Ontario, Canada	1.2 (0.9-1.5)	...
United States	1.0	...
Fresno, Calif	0.8 (0.6-1.1)	...
Mexico City, Mexico	1.1 (0.7-1.7)	...
χ^2_3	5.3	

*OR indicates odds ratio; CI, confidence interval; and ellipses, not applicable. Coefficients are based on a discrete-time survival equation with person-year as the unit of analysis, controlling the predictors in Table 2 and the significant interactions among these predictors described in the text. See Table 2 legend for sample sizes. Significance tests are based on a design-based method, the jackknife repeated-replications procedure that takes into consideration the weighting and clustering of sample cases.

†Wald χ^2 test for difference in statistically significant ORs across surveys.

‡Significant at the .05 level, 2-sided test.

people with substance use disorders eventually seek treatment puts these results into a broader context. Our finding is consistent with data on more general patterns of lifetime treatment seeking for a wide range of mental disorders in previous analyses of 2 of the 4 surveys considered here^{11,12} as well as in an 11-country comparative analysis of first treatment seeking among incident cases in a survey of members of mental health patient advocate groups.¹³

The seeming discrepancy between the low current treatment-seeking rates in prevalence studies and the high lifetime treatment-seeking rates in our study is largely explained by the long lag time between symptom onset and first treatment seeking. Whether this long lag time should be a source of concern is questionable since much of this time might be spent with only 1 or 2 symptoms of abuse that do not warrant treatment. To shed some light on this issue, we replicated the survival analysis separately for respondents with abuse and with dependence. Estimated lifetime rates of treatment seeking were found to be higher for dependence (60%-92% across surveys) than abuse without dependence (18%-40% across surveys), with estimated median time lags between symptom onset and first treatment seeking shorter for dependence (5-8 years across surveys) than abuse without dependence (10-19 years across surveys).

Table 4. Effects of Type of Substance Used in Predicting Treatment Seeking for Substance Use, 4 Surveys Combined*

	OR (95% CI)†	Significance of Between-Survey Differences χ^2 ‡
<i>Substance types</i>		
Alcohol	1.0 (0.7-1.3)	...
Cocaine	2.1 (1.6-2.7)‡	4.9
Heroin	2.6 (1.1-6.0)‡	1.8
Inhalants	1.2 (0.7-2.1)	...
Marijuana	1.1 (0.9-1.3)	...
Opiates	0.9 (0.4-1.5)	...
Psychedelics	1.1 (0.7-1.6)	...
Sedatives	1.2 (0.8-1.8)	...
Stimulants	1.0 (0.8-1.4)	...
χ^2_9	65.3‡	...
<i>Survey</i>		
Ontario, Canada	1.1 (0.9-1.3)	...
United States	1.0	...
Fresno, Calif	0.9 (0.7-1.1)	...
Mexico City, Mexico	1.1 (0.8-1.6)	...
χ^2_3	3.4	...

*OR indicates odds ratio; CI, confidence interval; and ellipses, not applicable. Coefficients are based on a discrete-time survival equation with person-year as the unit of analysis, controlling the predictors in Table 3. See Table 2 legend for sample sizes. Significance tests are based on a design-based method, the jackknife repeated-replications procedure that takes into consideration the weighting and clustering of sample cases.

†Wald χ^2 test for difference in statistically significant ORs across surveys. The χ^2 tests have 2 *df* rather than 3 because the number of respondents in the Mexico City sample with abuse or dependence on cocaine was too small for the ORs to be estimated for these substances.

‡Significant at the .05 level, 2-sided test.

Although it is unclear what the "right" time is to intervene in substance problems, it is a matter of concern that lag times are a decade or longer for individuals with dependence. The much longer lag times for abuse might be less of a problem. However, these long lag times seem inconsistent with the substance abuse treatment community's emphasis on early outreach and high-risk preventive intervention.

The significant inverse relationship between age of symptom onset and treatment seeking is also of concern. Early symptom onset is a powerful predictor not only of substance abuse³⁴ but also of the transition from abuse to dependence,³⁵ and of adverse social consequences of substance use, such as truncated educational attainment, teen childbearing, marital instability, and economic adversity.^{36,37} The low treatment-seeking rates of early-onset users presumably occurs because they hide their substance problems from their parents and teachers and are dependent on these adults to initiate treatment.^{38,39} It is less clear why early-onset users continue to have low rates of treatment seeking even after they enter adulthood, a pattern that we observed in subsample analyses. One possibility is that early-onset users develop adult lifestyles that allow them to continue using drugs without disrupting established adult roles, thereby reducing their chances of seeking treatment. Although we have no way of investigating this interpretation in these surveys, the reasons for low rates of treatment seeking among early-onset users warrant more serious investigation in future studies.

On a more positive note, we found that treatment seeking has increased significantly in recent cohorts. This is part of a broader pattern of similar cohort effects in treatment seeking for a wide range of mental disorders in several countries around the world.¹¹⁻¹³ In the case of substance use disorders, this could be owing to the joint effects of consolidation of drug and alcohol programs,⁴⁰ changing attitudes,⁴¹ greater awareness about treatment options,⁴² and expansion of treatment options.⁴³ Pressures for involuntary treatment have also increased through the expansion of school-based programs, employee assistance programs, mandatory treatment programs for drunk drivers, and substance programs in the criminal justice system. Because the surveys included no questions about site, the circumstances surrounding treatment, or whether treatment was voluntary or mandated, it is impossible to evaluate the relative importance of these various possibilities. Future research should include questions of this sort.

The finding that 4 of the 9 symptoms of substance dependence are associated with increased odds of treatment seeking is consistent with previous evidence that treatment seekers have more symptoms of dependence than those who do not seek treatment.^{6,10} Why these 4 symptoms are important and the others are not is unclear. Previous studies have generally found that the effects of symptoms are mediated by perceptions of need for treatment and recognition of adverse social and health consequences.^{5,9,44} It is plausible, then, to think that the effects of the dependence symptoms found in our report are mediated by unmeasured cognitive factors, although it is also plausible to speculate that these symptoms increase the probability of detection and involuntary treatment.

The finding that users of cocaine and heroin are more likely to seek treatment than users of other substances with comparable symptoms goes beyond previous studies, which have largely focused on treatment seeking for problems with one substance. One plausible interpretation of these results is that cocaine and heroin are more likely than other substances to lead to impairments or symptoms that promote treatment seeking. This possibility is consistent with the finding, in studies of gateway drugs, that use of cocaine and heroin typically occurs fairly late in the progression of drug use by an individual.^{45,46}

No hypotheses were advanced about differences across the surveys, since our goal was to search for consistencies in patterns and predictors. However, it is noteworthy that the higher rate of substance use disorder in the United States than in Ontario or Mexico City is consistent with the findings in cross-national substance-use prevalence studies.^{47,48} The higher rate of treatment seeking in Fresno than the rest of the United States is consistent with the findings of Kaskutas et al² in a US national sample that Hispanics are more likely than non-Hispanics to seek treatment for substance problems. However, the significant between-survey differences in odds of treatment seeking disappeared when we controlled for symptoms, implying that the lower gross treatment-seeking rate in Mexico City is owing to substance use disorders being less severe than in the other samples.

An important methodological limitation is that recall errors might have led to unreliability in retrospectively reported ages of symptom onset and first treatment seeking. Validation studies show that recall errors of this sort tend to be systematically “forward telescoped,” that is, to recall dates as being more recent than they are.^{49,50} This means that the lag times reported here are likely to be lower bound estimates. Variation in recall errors with age might at least partly explain the higher reported rates of treatment seeking in more recent cohorts.

Another limitation is the absence of confirmatory evidence of treatment from service records. In addition, it is important to note that we focused on treatment “seeking” rather than receiving treatment. No data in the surveys are available to estimate the proportion of treatment-seekers who eventually obtained appropriate treatment or the typical lag time between initial treatment seeking and eventually receiving appropriate care. We know from other studies that the lag time between initial treatment seeking and receiving appropriate care can be substantial.⁵¹ Future research is consequently needed not only to elaborate our understanding of modifiable determinants of initial treatment seeking, but also to study patterns and determinants of obtaining appropriate treatment.

Accepted for publication May 1, 2001.

The data reported here come from the International Consortium in Psychiatric Epidemiology (ICPE). The ICPE is supported by grant R01-DA11121 from the National Institutes of Health (NIH), Bethesda, Md. The Mental Health Supplement to the Ontario Health survey was supported by funds from the Ontario Ministry of Community and Social Services, Ottawa. The NCS was supported by grants R01-MH46376, R01-MH49098, and K05-MH00507 from the NIH, and by grant 90135190 from the W.T. Grant Foundation, New York, NY. The Mexican-American Prevalence and Services survey was supported by grants R01-MH51192 and R01-DA12167 from the NIH. The Epidemiology of Psychiatric Comorbidity survey was funded by grant 2077-H9302 from the Mexican National Council of Science and Technology, Mexico City.

From the Departments of Health Care Policy (Dr Kessler), and Psychiatry (Dr Greenfield), Harvard Medical School, Boston, Mass; the Department of Psychology, School of Natural Sciences, California State University, Fresno (Dr Aguilar-Gaxiola); the Institute for Social Research, University of Michigan, Ann Arbor (Ms Berglund); Instituto Mexicano de Psiquiatria, Huipulco, Mexico (Caraveo-Anduaga); the Addiction Research Foundation, Clinical, Social, and Evaluation Research Department, London, Ontario (Dr DeWit); McLean Hospital, Belmont, Mass (Dr Greenfield); Sociology Department, San Diego State University, San Diego, Calif (Dr Kolody); Department of Psychiatry, College of Physicians and Surgeons, Columbia University, New York, NY (Dr Olfson); and Robert Wood Johnson Medical School—UMDNJ, Institute for Quality Research and Training, New Brunswick, NJ (Dr Vega).

Corresponding author and reprints: Ronald C. Kessler, PhD, Department of Health Care Policy, Harvard Medical School, 180 Longwood Ave, Boston, MA 02115 (e-mail: kessler@hcp.med.harvard.edu).

1. Wu LT, Kouzis AC, Leaf PJ. Influence of comorbid alcohol and psychiatric disorders on utilization of mental health services in the National Comorbidity Survey. *Am J Psychiatry*. 1999;156:1230-1236.
2. Kaskutas LA, Weisner C, Caetano R. Predictors of help seeking among a longitudinal sample of the general population, 1984-1992. *J Stud Alcohol*. 1997;58:155-161.
3. Rumpf HJ, Hapke U, John U. Previous help seeking and motivation to change drinking behavior in alcohol-dependent general hospital patients. *Gen Hosp Psychiatry*. 1998;20:115-119.
4. Tucker JA. Predictors of help-seeking and the temporal relationship of help and recovery among treated and untreated recovered problem drinkers. *Addiction*. 1995;90:805-809.
5. Longshore D. Help-seeking by African American drug users: a prospective analysis. *Addict Behav*. 1999;24:683-686.
6. Varney SM, Rohsenow DJ, Dey AN, Myers MG, Zwick WR, Monti PM. Factors associated with help seeking and perceived dependence among cocaine users. *Am J Drug Alcohol Abuse*. 1995;21:81-91.
7. Eland-Goossensen A, van de Goor IA, Garretsen HF. Heroin addicts in the community and in treatment compared with severity of problems and need for help. *Subst Use Misuse*. 1997;32:1313-1330.
8. Blomqvist J. Treated and untreated recovery from alcohol misuse: environmental influences and perceived reasons for change. *Subst Use Misuse*. 1999;34:1371-1406.
9. Hajema KJ, Knibbe RA, Drop MJ. Social resources and alcohol-related losses as predictors of help seeking among male problem drinkers. *J Stud Alcohol*. 1999;60:120-129.
10. Finney JW, Moos RH. Entering treatment for alcohol abuse: a stress and coping model. *Addiction*. 1995;90:1223-1240.
11. Olsson M, Kessler RC, Berglund PA, Lin E. Psychiatric disorder onset and first treatment contact in the United States and Ontario. *Am J Psychiatry*. 1998;155:1415-1422.
12. Kessler RC, Olsson M, Berglund PA. Patterns and predictors of treatment contact after first onset of psychiatric disorders. *Am J Psychiatry*. 1998;155:62-69.
13. Christiana JM, Gilman SE, Guardino M, Kessler RC, Mickelson K, Morselli PL, Olsson M. Duration between onset and time of obtaining initial treatment among people with anxiety and mood disorders: an international survey of members of mental health patient advocate groups. *Psychol Med*. 2000;30:693-703.
14. Schober R, Annis HM. Barriers to help-seeking for change in drinking: a gender-focused review of the literature. *Addict Behav*. 1996;21:81-92.
15. Smith L. Help seeking in alcohol-dependent females. *Alcohol Alcohol*. 1992;27:3-9.
16. Offord DR, Boyle M, Campbell D, Cochrane J, Goering PN, Lin E, Rhodes A, Wong M. *Mental Health in Ontario: Selected Findings From the Mental Health Supplement to the Ontario Health Survey*. Toronto: Queen's Printer for Ontario; 1994.
17. Kessler RC, McGonagle KA, Zhao S, Nelson C, Hughes M, Eshleman S, Wittchen H-U, Kendler KS. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. *Arch Gen Psychiatry*. 1994;51:8-19.
18. Vega WA, Kolody B, Aguilar-Gaxiola S, Alderete E, Catalano R, Caraveo-Anduaga J. Lifetime prevalence of DSM-III-R psychiatric disorders among urban and rural Mexican Americans in California. *Arch Gen Psychiatry*. 1998;55:771-778.
19. Caraveo J, Martinez J, Rivera B. A model for epidemiological studies on mental health and psychiatric morbidity. *Salud Mental*. 1998;21:48-57.
20. WHO International Consortium of Psychiatric Epidemiology. Cross-national comparisons of the prevalences and correlates of mental disorders: an ICPE study. *Bull World Health Organ*. 2000;78:413-426.
21. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition*. Washington, DC: American Psychiatric Press; 1987.
22. World Health Organization. *Composite International Diagnostic Interview (CIDI): Version 1.0*. Geneva, Switzerland: World Health Organization; 1990.
23. Kessler RC. Building on the ECA: the National Comorbidity Survey and the Children's ECA. *Int J Methods Psychiatr Res*. 1994;4:81-94.
24. Wittchen H-U. Reliability and validity studies of the WHO Composite International Diagnostic Interview (CIDI): a critical review. *J Psychiatr Res*. 1994;28:57-84.
25. Kessler RC, Wittchen H-U, Abelson JM, McGonagle K, Schwarz N, Kendler KS, Knäuper B, Zhao S. Methodological studies of the Composite International Diagnostic Interview (CIDI) in the US National Comorbidity Survey. *Int J Methods Psychiatr Res*. 1998;7:33-55.
26. Kaplan EL, Meier P. Nonparametric estimation from incomplete observations. *J Am Stat Assoc*. 1958;53:457-481.
27. Efron B. Logistic regression, survival analysis, and the Kaplan-Meier curve. *J Am Stat Assoc*. 1988;83:414-425.
28. Kish L, Frankel MR. Inferences from complex samples. *J Royal Statistical Society*. 1974;36:1-37.
29. *SAS/STAT User's Guide: Volume 2, GLH-VARCOMP*. 4th ed. Cary, NC: SAS Institute Inc; 1990.
30. *SAS Guide to Macro Processing: Version 6*. 2nd ed. Cary, NC: SAS Institute Inc; 1990.
31. *SAS Language: Reference Version 6*. 1st ed. Cary, NC: SAS Institute Inc; 1990.
32. International Consortium in Psychiatric Epidemiology. Available at: <http://www.hcp.med.harvard.edu/icpe>. Accessed June 30, 2001.
33. Power R, Hartnoll R, Chalmers C. The role of significant life events in discriminating help-seeking among illicit drug users. *Int J Addict*. 1992;27:1019-1034.
34. Kessler RC, Aguilar-Gaxiola S, Andrade L, Bijl R, Borges G, Caraveo-Anduaga JJ, DeWit DJ, Kolody B, Merikangas KR, Molnar BE, Vega WA, Walters EE, Wittchen H-U. Cross-national comparisons of comorbidities between substance use disorders and mental disorders: results from the International Consortium in Psychiatric Epidemiology. In: Bukoski WJ, Sloboda Z, eds. *Handbook for Drug Abuse Prevention Theory, Science, and Practice*. New York, NY: Plenum Publishing Corp; in press.
35. Kessler RC, Aguilar-Gaxiola S, Andrade L, Bijl R, Borges G, Caraveo-Anduaga JJ, DeWit DJ, Kolody B, Merikangas KR, Molnar BE, Vega WA, Walters EE, Wittchen H-U, Ustun TB. Mental-substance comorbidities in the ICPE surveys. *Nordic J Psychiatry*. In press.
36. Kessler RC, Walters EE, Forthofer MS. The social consequences of psychiatric disorders, III: probability of marital stability. *Am J Psychiatry*. 1998;155:1092-1096.
37. Newcomb MD, Bentler PM. *Consequences of Adolescent Drug Use: Impact on the Lives of Young Adults*. Ann Arbor, Mich: Books on Demand; 1988.
38. Dulcan MK, Costello EJ, Costello AJ, Edelbrock C, Brent D, Janiszewski S. The pediatrician as gatekeeper to mental health care for children: do parents' concerns open the gate? *J Am Acad Child Adolesc Psychiatry*. 1990;29:453-458.
39. Costello EJ, Janiszewski S. Who gets treated? factors associated with referral in children with psychiatric disorders. *Acta Psychiatr Scand*. 1990;81:523-529.
40. Hubbard RL. Treating combined alcohol and drug abuse in community-based programs. In: Galanter M, ed. *Recent Developments in Alcoholism*. Vol 8. New York, NY: Plenum Press; 1990:273-283.
41. Kaskutas LA. Changes in public attitudes toward alcohol control policies since the warning label mandate of 1988. *J Pub Health Policy*. 1993;12:30-37.
42. Greenfield SF, Keliher A, Jacobs D, Gordis E. The development of National Alcohol Screening Day. *Harv Rev Psychiatry*. 1999;6:327-330.
43. Galanter M, Kleber HD, eds. *Textbook of Substance Abuse Treatment*. 2nd ed. Washington, DC: American Psychiatric Press; 1999.
44. Tucker JA, Gladis JA. Help-seeking and recovery by problem drinkers: characteristics of drinkers who attended Alcoholics Anonymous or formal treatment or who recovered without assistance. *Addict Behav*. 1993;18:529-542.
45. Kandel DB, Yamaguchi K, Chen K. Stages of progression in drug involvement from adolescence to adulthood: further evidence for the gateway theory. *J Stud Alcohol*. 1992;53:447-457.
46. Mackesy-Amiti ME, Fendrich M, Goldstein PJ. Sequence of drug use among serious drug users: typical vs atypical progression. *Drug Alcohol Depend*. 1997;45:185-196.
47. Health Canada. *Canada's Drug Strategy*. Ottawa, Ontario: Minister of Public Works and Government Services Canada; 1998.
48. Rosovsky H, ed. *Drug Use in Mexico: Diagnosis, Trends and Actions*. Mexico City, Mexico: Ministry of Health; 1999.
49. Knäuper B, Cannell CF, Schwarz N, Bruce ML, Kessler RC. Improving accuracy of major depression age-of-onset reports in the US National Comorbidity Survey. *Int J Methods Psychiatr Res*. 1999;8:39-48.
50. Bradburn, NM. Temporal representation and event dating. In: Stone AA, Turkkan JS, Bachrach CA, Jobe JB, Kurtzman HS, Cain VS, eds. *The Science of Self-Report: Implications for Research and Practice*. Mahwah, NJ: Lawrence Erlbaum Associates; 2000:49-61.
51. Wang PS, Gilman SE, Guardino M, Christiana JM, Morselli PL, Mickelson K, Kessler RC. Initiation of and adherence to treatment for mental disorders: examination of patient advocate group members in 11 countries. *Med Care*. 2000;38:926-937.