

Prevalence of Psychiatric Disorders Among Persons Convicted of Driving While Impaired

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Background: Large numbers of convicted drunk drivers are entering alcohol treatment programs, yet little information is available about their need for psychiatric treatment. This study of convicted drunk drivers estimates lifetime and 12-month prevalence of DSM-III-R psychiatric disorders (alcohol and drug abuse and dependence, major depressive disorder, dysthymic disorder, generalized anxiety disorder, posttraumatic stress disorder, and antisocial personality disorder) and compares rates with estimates from a US population-based survey.

Methods: Six hundred twelve women and 493 men, aged 23 to 54 years, convicted of driving while impaired, who had been referred to a screening program in Bernalillo County, New Mexico, were located and interviewed using the Diagnostic Interview Schedule between January 25, 1994, and June 30, 1997. Psychiatric diagnoses were compared with findings from the National Comorbidity Survey for the western region of the United States, conducted between September 14, 1990, and February 6, 1992.

Results: Eighty-five percent of female and 91% of male offenders reported a lifetime alcohol-use disorder, compared with 22% and 44%, respectively, in the National Comorbidity Survey sample. Thirty-two percent of female and 38% of male offenders had a drug-use disorder, compared with 16% and 21%, respectively, in the National Comorbidity Survey sample. For offenders with alcohol-use disorders, 50% of women and 33% of men had at least 1 additional psychiatric disorder other than drug abuse or dependence, mainly posttraumatic stress disorder or major depression.

Conclusion: Drunk-driving offenders need assessment and treatment services not only for alcohol problems but also for drug use and the other psychiatric disorders that commonly accompany alcohol-related problems.

Arch Gen Psychiatry. 2001;58:943-949

BETWEEN 1995 and 1998, more than 1.4 million Americans were arrested annually for driving while impaired (DWI).¹ Offenders are entering alcohol treatment programs in record numbers,² and, for many, the DWI conviction presents an opportunity for early intervention.² But DWI treatment programs have shown disappointing results, with neither recidivism nor alcohol-related crashes substantially reduced.³⁻⁵

Several factors contribute to these findings. Typically, offenders are coerced into treatment programs and may not be motivated to change their drinking habits. The programs offered often are abstinence-oriented, an end point many offenders believe is inappropriate.⁵ Also, offenders are likely to have emotional and psychiatric problems in addition to alcohol-related problems, making treatment more challenging.^{6,7} Finally, "treatments" for DWI of-

fenders often include short-term programs⁵ that focus primarily on educating offenders about the effects of alcohol or about drunk-driving laws.⁸

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Treatment programs should be tailored to clients' specific offense histories, the severity of their drinking problems, and their other psychiatric problems.^{8,9} But little systematic research has examined the level of severity of drinking problems or other psychiatric problems among arrested or convicted DWI offenders,^{2,10-12} and often conclusions rely on self-reported information from coerced subjects.^{11,13,14} These studies also suffer from methodological problems, inconsistencies in defining alcohol problem status,^{2,11} and use of samples with more severe alcohol-related problems than are found in the overall population of convicted offenders.^{7,11}

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SUBJECTS AND METHODS

SUBJECTS

The sample was drawn from a database of convicted DWI offenders referred to and screened by the Lovelace Comprehensive Screening Program (LCSP).²⁴ This program contracted with the Bernalillo County Metropolitan Court, Albuquerque, NM, to provide screening services to convicted first offenders. Although the LCSP was a first-offender program, about 20% of referrals were repeat offenders at the time of their referral.²⁵

Details about the LCSP have been published.²⁴ Previous studies in this population found characteristics similar to those of DWI-offender populations described elsewhere in the United States with respect to age, sex, and marital status,²⁴⁻²⁶ but this population has higher proportions of Hispanics and American Indians than those in other geographical areas (see Vingilis,¹¹ Perrine et al,¹³ and Moskowitz et al²⁷). The mean blood alcohol concentration at arrest for offenders in the LCSP is 0.16 g/dL, which is in the middle range of mean blood alcohol concentrations for drunk drivers arrested elsewhere in the United States.²⁸

The sample for the present study included 1208 consecutive women referrals from April 4, 1989, through March 31, 1992, and 1407 men drawn from all men referred for screening during the study. Subjects were selected weekly, corresponding to the 5-year anniversary of their LCSP referral. Men were frequency matched to women by date of screening referral and ethnicity and were oversampled, as a previous survey conducted in a New Mexico community revealed higher refusal rates among men (39%) than women (21%).²⁹

Information about nonlocated subjects was sent to the National Death Index to match against death certificates filed in all states (excluding New York, NY), identifying 18 women and 38 men as deceased. Of the remaining 2559

subjects, 2062 (81%) were located (1005 women and 1057 men) and 1396 were interviewed. Most (85%) resided in New Mexico; the remainder lived in 37 other states. Two women and 5 men were excluded because of incomplete information. Analyses to determine differences between interviewed and noninterviewed subjects showed that, after controlling for demographic factors, the interviewed and noninterviewed subjects had similar blood alcohol concentrations at arrest and similar diagnoses of alcohol abuse and dependence at screening.³⁰

Also eliminated were 127 women and 107 men who were not either white or Hispanic and 19 women and 31 men older than 54 years. These limitations were imposed to enable comparisons with the national sample. This yielded a final DWI sample of 612 women and 493 men. Sex comparisons revealed that they were similar with respect to age, ethnic distribution, and educational level, but differed with respect to marital status, income, and number of prior DWIs (**Table 1**).

Complete methods for locating and interviewing subjects are published.³⁰ The primary data source for locating clients was LCSP record data; other databases also were used. A comprehensive location protocol was used by bilingual (English and Spanish) staff, including a letter sequence, telephone calls, and home visits. (Subjects were mailed a series of letters at 2-week intervals. A letter sequence included 5 identical letters explaining the study and asking the client to participate, and 1 "pleading letter" emphasizing the importance of the study.) About 32% were telephone interviews, conducted with out-of-state subjects and those unwilling or unable to be interviewed in person. In-person interviews were conducted at our office, at a neutral location, or in the subjects' own home. Once located, willing participants provided written informed consent and were given a monetary incentive to complete the interview. The protocol was approved by an institutional review board.

In a review of 22 studies on drinking-driving offenders and alcoholism, the percentage of offenders considered to be "alcoholic" ranged from 4% to 87%.¹¹ This wide range in the estimated prevalence of alcohol problems among DWI offenders creates uncertainty about how to deal effectively with these populations.¹¹ The Institute of Medicine² draws the rather unhelpful conclusion from the literature that convicted drunk-driving offenders referred to treatment have higher rates of alcohol-use disorders than are found in the general population and lower rates than clinical populations.

Less is known about the prevalence of this population's drug-use or non-substance-abuse psychiatric disorders. Researchers have examined the bodily fluids of crash-involved drivers, finding high rates of drug prevalence in addition to alcohol (10%-22%).¹⁵ This says little about offenders' drug-use disorders. Studies suggest that drunk-driving offenders have high rates of antisocial behavior^{14,16-18} and high levels of depression¹⁹⁻²¹ and that repeat offenders are particularly likely to exhibit antisocial tendencies and other psychopathologic conditions.²¹⁻²³ However, this literature provides an inadequate psychiatric profile of the DWI-offender population.

This study, by systematically collecting diagnostic data, strives to determine (1) the prevalence of DWI of-

fenders' alcohol use and comorbid psychiatric disorders and (2) how much this differs from that of the general community. We argue that primary care and mental health care professionals need to understand DWI offenders' alcohol use, drug use, and other non-substance-abuse psychiatric disorders. Only then can more appropriate and effective treatment interventions be designed.

RESULTS

PREVALENCE OF LIFETIME AND 12-MONTH PSYCHIATRIC DISORDERS IN THE DWI SAMPLE

Eighty-five percent of women and 91% of men reported lifetime alcohol-use disorders (abuse or dependence) ($P < .01$) (**Table 2**). More than 30% of women and 35% of men had a 12-month diagnosis of alcohol dependence. About one third of offenders met criteria for lifetime drug-use disorders (abuse or dependence) (**Table 2**), most having drug dependence. Ten percent of women and 12% of men reported a 12-month drug dependence disorder. The percentage of interviewees reporting neither alcohol nor drug diagnoses was 13% for women and 8% for men.

Lifetime major depressive disorder was found in 28% of women and 13% of men. Major depressive disorder

Rates of substance abuse and other psychiatric disorders in the general adult population from the National Comorbidity Survey (NCS)³¹ were compared with those of DWI offenders. The NCS is based on a stratified, multistage area probability sample of noninstitutionalized civilians aged 15 to 54 years living in the 48 contiguous states and includes more than 8000 respondents. The survey was conducted between September 14, 1990, and February 6, 1992. Only subjects who lived in the western region of the United States (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, or Hawaii) were included for comparison with the DWI sample. The NCS assessed *DSM-III-R*³² criteria using the Composite International Diagnostic Interview,³³ which is derived from, and a refinement of, the Diagnostic Interview Schedule (DIS).³¹

DIAGNOSIS

Interviewers were trained by one of us (E.S.) and met weekly to monitor consistency and discuss coding issues. Interviews, conducted from January 25, 1994, to June 30, 1997, included demographic information and a computerized version of the DIS.^{34,35} The DIS, structured and designed for use by lay interviewers, has good to acceptable levels of validity and reliability with general population samples.³⁶⁻⁴¹ The interviewers read the DIS questions to subjects and entered their responses into the computer. The DIS determines symptoms of disease, diagnoses, and age when the subject met criteria for the diagnosis corresponding to the *DSM-III-R*.³⁵ Disorders assessed for the present study include rates of lifetime and 12-month alcohol and drug abuse and dependence, major depressive disorder, dysthymic disorder, generalized anxiety disorder, posttraumatic stress disorder (PTSD), and antisocial personality disorder. *Lifetime prevalence* is the percentage of persons who met

diagnostic criteria for a disorder at any time in their lives and *12-month prevalence* is the percentage of subjects who experienced the disorder within the 12 months before the follow-up interview.

COMPARISON SAMPLE

National Comorbidity Survey data were obtained from the public-use data file, downloaded from the Internet site maintained by the Inter-university Consortium for Political and Social Research. Neither the NCS data nor the DWI data included information that would allow identification of the Hispanic subgroup (eg, Mexican American, Cuban American, or Puerto Rican). However, most Hispanic populations in the western United States are Mexican American.⁴²

DATA ANALYSES

Comparisons between the 2 samples were made by weighting the NCS sample to match the DWI-offender sample by age (23-29, 30-34, 35-44, or 45-54 years), ethnicity, and educational level (0-11, 12, or ≥ 13 years). All comparisons between the 2 samples were made separately for men and women. For the NCS sample, all observations in a specific age, ethnic group, or educational level stratum were assigned a weight, computed as the ratio of the proportion of DWI offenders to the proportion of NCS respondents in that stratum. Weights for all observations in the DWI-offender sample were set to 1.0. All proportions, SEs, and tests of significance were computed using the SUDAAN procedure CROSSTAB.⁴³ The sampling design was specified as stratified sampling with replacement. Taylor series linearization was selected as the method for variance estimation. Tests for statistically significant differences between the 2 samples were made using a χ^2 test statistic analogous to the Pearson χ^2 .⁴³

was experienced by 17% of women and 7% of men in the 12 months before the interview. A higher proportion of women than men experienced lifetime and 12-month dysthymic disorder, generalized anxiety disorder, and PTSD. A higher proportion of men than women met criteria for antisocial personality disorder.

COMPARISONS WITH THE NCS SAMPLE

The prevalence of lifetime alcohol abuse and dependence, and drug dependence for both sexes was much higher in the DWI than in the matched NCS sample (Table 2). For example, at 61% for women and 70% for men, the rates of lifetime alcohol dependence among DWI offenders were more than twice those of the respective NCS samples. Reported 12-month symptoms of alcohol and other drug dependence diagnoses in the DWI population also exceeded those in the NCS population.

Among offenders with alcohol abuse or dependence, similar proportions of women in the DWI and NCS samples (about half) reported at least 1 additional psychiatric disorder (Table 3). The 3 most common additional disorders were drug dependence, major depressive disorder, and PTSD. Compared with the NCS sample, a lower percentage of men (DWI sample, 33%; NCS sample, 42%) had at

least 1 additional psychiatric disorder, the most common being drug dependence, major depressive disorder, antisocial personality disorder, and PTSD.

COMMENT

Common sense and previous research have already informed researchers that the DWI-offender population has high rates of alcohol-use disorders. What is significant about this report's findings is how high these rates are, especially when compared with those of the general community sample. In addition to the high rates, most individuals involved with alcohol or other drugs in the DWI sample met criteria for lifetime dependence, whereas in the general population sample there was a higher proportion with abuse (without dependence). These data suggest that as a group the population of DWI offenders is closer to a clinical than a nonclinical population. Furthermore, 12-month diagnoses indicate a high degree of symptoms in the ensuing years following the DWI referral, which underscores the need for effective therapies in this population.

Some studies suggest that the proportion of alcoholics in DWI-offender populations is lower than that reported in the present study. Fine and colleagues⁴⁴

classify 50% of first-DWI offenders as beginning problem drinkers, with only 8% evaluated as having serious alcohol-related problems. Stewart et al⁴⁵ studied more than 5000 first-DWI offenders, finding that 92% had low scores on the Alcohol Dependence Scale.⁴⁶ However, no diagnostic interviews were conducted in this population.

Conversely, several studies find rates approaching those in the present study. A longitudinal study¹⁷ of a community sample of young men reports that among those

later convicted of drunk driving, about half were alcohol dependent at follow-up. Clinical evaluations of consecutive first offenders in a Massachusetts court found that 82% were alcoholics or problem drinkers.⁴⁷ Small⁴⁸ suggests that 50% of all first-time, 70% of second-time, and 100% of third-time DWI offenders are alcoholics. Results of these studies support our suggestion that any history of conviction for drunk driving should alert the examining physician to evaluate the patient for alcohol abuse and dependence.

Only 2 previously published studies have used structured diagnostic interviews to determine diagnoses of alcohol abuse or dependence in DWI-offender populations. The first was conducted among 617 New York offenders (men, 85%; white, 86%; repeat offenders, 56%) referred for alcohol evaluation.⁴⁹ The authors' findings were similar to ours with respect to the proportion of women with alcohol dependence (61%) but higher for men (82%). Another New York study,⁵⁰ conducted among 184 convicted DWI-offender volunteers, found alcohol dependence in 66% of first and 87% of repeat offenders.

This is the first study to evaluate rates of drug abuse and dependence in a DWI-offender sample. Findings demonstrate a high degree of involvement with drugs other than alcohol. Drug abuse or dependence was reported by an estimated 32% of women and 38% of men. These rates greatly exceed those in the general community sample. Findings are consistent with research showing that a high percentage of crash drivers¹⁵ and drivers suspected of impaired driving^{51,52} have used other drugs in addition to alcohol. It also is consistent with investigations done in community and clinical samples of persons with alcohol-use disorders, finding high rates of drug problems.⁵³ These data suggest that all persons with drunk-driving offenses should also undergo evaluation for drug-use disorders.

Study limitations include the low participation rates and the procedures used to assign diagnoses. Low participation rates are addressed in another report,³⁰ which showed that alcohol diagnosis and blood alcohol concentration at arrest of subjects interviewed were similar

Table 1. Characteristics of the DWI-Offender Sample*

	Women (n = 612)	Men (n = 493)
Age, y		
<30	201 (32.8)	177 (35.9)
30-34	151 (24.7)	111 (22.5)
35-39	109 (17.8)	93 (18.9)
40-44	75 (12.3)	54 (11.0)
45-54	76 (12.4)	58 (11.8)
Ethnicity		
Non-Hispanic white	256 (41.8)	212 (43.0)
Hispanic	356 (58.2)	281 (57.0)
Education, y		
<12	152 (24.8)	121 (24.5)
12	165 (27.0)	156 (31.6)
>12	295 (48.2)	216 (43.8)
Marital status†		
Single	215 (35.1)	216 (43.8)
Married	169 (27.6)	161 (32.7)
Divorced, separated, or widowed	228 (37.3)	116 (23.5)
Family income, \$†		
<16 800	221 (36.1)	124 (25.2)
16 800-31 199	193 (31.5)	174 (35.3)
≥31 200	163 (26.6)	176 (35.7)
Unknown	35 (5.7)	19 (3.9)
No. of prior DWIs (1995-1997)†		
1	470 (76.8)	305 (61.9)
2	102 (16.7)	110 (22.3)
≥3	40 (6.5)	78 (15.8)

*Data are given as number (percentage). Some percentages do not sum to 100 because of rounding. DWI indicates driving while impaired.

† $P < .01$.

Table 2. Prevalence of Psychiatric Disorders (DWI-Offender vs NCS [Western US] Sample)*

	Women				Men			
	Lifetime		12-mo		Lifetime		12-mo	
	DWI Offender (n = 612)	NCS (n = 602)	DWI Offender (n = 612)	NCS (n = 602)	DWI Offender (n = 493)	NCS (n = 578)	DWI Offender (n = 493)	NCS (n = 578)
Alcohol abuse	24.5 (1.7)†	10.9 (2.0)	3.3 (0.7)†	0.9 (0.4)	21.3 (1.8)	15.1 (2.9)	4.3 (0.9)	4.7 (1.8)
Alcohol dependence	60.9 (2.0)†	11.4 (1.9)	30.1 (1.9)†	4.5 (1.1)	70.0 (2.1)†	29.2 (3.4)	35.7 (2.2)†	16.0 (3.0)
Drug abuse	6.4 (1.0)	4.4 (1.1)	1.5 (0.5)	0.4 (0.3)	8.1 (1.2)	8.8 (2.3)	2.2 (0.7)	1.1 (0.6)
Drug dependence	25.9 (1.8)†	11.1 (2.1)	10.0 (1.2)†	3.2 (1.2)	30.4 (2.1)†	12.0 (1.9)	12.0 (1.5)†	4.4 (1.2)
Major depressive disorder	28.3 (1.8)‡	20.1 (2.5)	17.2 (1.5)†	10.3 (1.7)	12.8 (1.5)	16.9 (3.0)	6.6 (1.1)	7.0 (1.8)
Dysthymic disorder	10.6 (1.2)‡	7.0 (1.3)	2.3 (0.6)	1.9 (0.7)	6.1 (1.1)	8.8 (2.5)	0.8 (0.4)	1.4 (0.9)
Generalized anxiety disorder	7.0 (1.0)	5.6 (1.3)	4.7 (0.9)†	1.6 (0.5)	2.4 (0.7)	3.9 (1.0)	2.0 (0.6)	1.5 (0.5)
Posttraumatic stress disorder	27.0 (1.8)†	12.6 (2.2)	16.6 (1.5)†	6.3 (1.5)	11.8 (1.5)‡	6.8 (1.8)	6.5 (1.1)	4.7 (1.7)
Antisocial personality disorder	6.4 (1.0)†	2.5 (0.9)	14.6 (1.6)	12.4 (2.8)

*Data are given as percentage (SE). DWI indicates driving while impaired (restricted to ages 23-54 years and ethnicity of non-Hispanic white or Hispanic); NCS, National Comorbidity Survey (adjusted to match distribution of age, ethnicity, and years of education in offender sample); and ellipses, data not available.

†Prevalence of disorder is significantly different between the DWI offender and NCS sample, $P < .01$.

‡Prevalence of disorder is significantly different between the DWI offender and NCS sample, $P < .05$.

Table 3. Prevalence of Psychiatric Disorders Among Those With a Lifetime Alcohol Abuse or Dependence Disorder (DWI Offender vs NCS [Western US] Sample)*

	Women		Men	
	DWI Offender (n = 523)	NCS (n = 147)	DWI Offender (n = 450)	NCS (n = 254)
Drug abuse without dependence	7.3 (1.1)	14.3 (4.0)	8.7 (1.3)	14.6 (4.3)
Drug dependence	29.3 (2.0)	34.6 (6.1)	33.1 (2.2)	24.2 (4.8)
Major depressive disorder	30.8 (2.0)	35.3 (6.1)	14.0 (1.6)	23.3 (4.9)
Dysthymic disorder	11.7 (1.4)	14.6 (3.9)	6.4 (1.2)	12.0 (3.9)
Generalized anxiety disorder	8.0 (1.2)	9.3 (3.5)	2.4 (0.7)	6.4 (2.1)
Posttraumatic stress disorder	29.9 (2.0)	24.1 (5.9)	12.7 (1.6)	13.9 (5.1)
Antisocial personality disorder	7.3 (1.1)	9.5 (3.5)	16.0 (1.7)	21.2 (5.3)
Any disorder excluding substance disorder	50.3 (2.2)	53.7 (6.6)	32.7 (2.2)	41.9 (5.9)

*Data are given as percentage (SE). DWI indicates driving while impaired (restricted to those with lifetime alcohol abuse or dependence disorders, ages 23-54 years, and ethnicity of non-Hispanic white or Hispanic); NCS, National Comorbidity Survey (adjusted to match distribution of age, ethnicity, and years of education in offender sample).

to those of subjects not interviewed, suggesting that bias was not a factor with respect to alcohol diagnoses. Possible biases with respect to other psychiatric disorders, however, were not evaluated.

Comparison between the DWI and NCS surveys indicates that although both used the same diagnostic criteria (*DSM-III-R*), the interviews were not identical, with the NCS interview perhaps yielding higher prevalence estimates than the DIS.³¹ Also, the DWI and NCS surveys were administered by lay interviewers. Neither interview yields results as accurate as those of clinicians skilled in assigning diagnoses.³¹ The study limitations would be expected to lead to conservative prevalence estimates for most diagnoses in the DWI sample.

New Mexico is notorious for its high alcohol-related traffic fatality rates,⁵⁴ which may suggest that these offenders may have higher rates of psychiatric problems than offenders from other states. This concern is mitigated by the similarities of our sample to other DWI-offender populations and by our sample's nonclinical nature. If anything, these factors would lead to projected underestimates of the true rate of alcohol diagnoses, compared with national rates.

This study is also unique in its inclusion of a large sample of female offenders. Because women constitute a small proportion (13%-18%) of all DWI arrests nationally, only a few studies⁵⁵⁻⁵⁸ have focused on female offenders. We found that rates of alcohol-use disorders are higher for male than female offenders. This is inconsistent with findings of a 1970s study⁵⁹ suggesting that women arrested for DWI may have higher levels of substance-use disorders compared with male offenders. But recent studies^{23,60,61} report lower or similar sex-specific rates of alcohol dependence among female offenders. In the present study, there were no sex differences among subjects in drug abuse or dependence.

Our findings also agree with study results from a non-clinical sample of DWI offenders that found women who are alcohol dependent report higher levels of depression symptoms than men who are alcohol dependent.²³ Other sex differences in the offender population are consistent with characteristics of the general population.⁶² However, our findings that female offenders are more likely than male offenders to have affective disorders and

PTSD, but not antisocial personality disorder, do not support the conclusion of Argeriou and Paulino⁵⁹ that female DWI offenders may have higher levels of "social pathologic conditions" than men. Our data suggest that female DWI offenders diverge more from the general population of women with respect to overall psychiatric morbidity than male offenders diverge from the general male population.

Considering the high rate of alcohol and other drug dependence diagnoses in the DWI-offender population, a high level of comorbidity is expected, because individuals with alcohol-use disorders, in clinical and community samples, often have additional comorbid disorders.⁶³ A study⁵⁰ conducted among DWI offenders using the *SCL-90-R*⁶⁴ self-report inventory for psychopathologic conditions found that the prevalence of psychiatric symptoms was strongly related to whether the individual had a *DSM-III-R* diagnosis of alcohol dependence. Comparison of overall rates of these disorders in the subset of DWI offenders with alcohol-use disorders in a comparable NCS sample reveals high rates of other co-occurring disorders in both samples.

Studies^{5,9,21} have pointed to the heterogeneity of DWI-offender populations and the need for typologies to better match offenders with treatments geared to their specific needs. Our study suggests that, while there is a great deal of heterogeneity with respect to psychiatric comorbidity, only a small percentage (men, 9%; women, 15%) did not meet lifetime criteria for alcohol-use disorders, far exceeding the rates in the general population. Our findings also indicate that treatment providers for DWI populations should be prepared to evaluate for and address psychiatric problems commonly co-occurring in populations with alcohol-use disorders. This is especially important because studies of comorbid psychiatric disorders among persons with alcoholism find that the severity of psychiatric symptoms is often predictive of poor treatment outcome for those who are substance abusers.^{65,66} Furthermore, more intense interventions at an early stage may reduce recidivism and crash rates.³ Early detection is particularly important for women, who are more likely to experience psychiatric comorbidity and less likely to seek early help for drinking problems.⁶⁷

Accepted for publication April 3, 2001.

This study was funded by grant RO1 AA09620 from the National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Bethesda, Md.

We thank the Bernalillo County Metropolitan Court and the Lovelace Respiratory Research Institute, Albuquerque, NM, for their support of our program, Joyce Welt and Don Peyton, BA, BS, for manuscript preparation, Charles Paine, PhD, and Paula Bradley for editorial assistance; and gratefully acknowledge all the men and women who participated in this research.

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