

Drug Use Disorders and Treatment Contact among Homeless Adults in Alameda County, California

ABSTRACT

Objectives. This study estimates the extent and distribution of specific drug problems among homeless adults.

Methods. A countywide probability sample of 564 homeless adults received structured interviews that included a standardized assessment of substance use disorders.

Results. Two thirds of the sample (69.1%) had a lifetime history of a substance use disorder (including abuse of or dependence on alcohol [52.6%] or drugs [52.2%]); half had a current (52.4%) substance use disorder (including alcohol [38.8%] or drugs [31.3%]). Current drug disorders were higher among respondents who were younger, homeless longer, or sampled from the city of Oakland, Calif. Alcohol use disorders were higher among men than among women; surprisingly, drug use disorders were not.

Conclusion. Rates of current drug use disorders for homeless adults were more than eight times higher than general population estimates. However, estimates of drug problems among homeless adults vary as a function of case ascertainment and sampling strategy. Estimates based only on samples from urban areas may overestimate drug problems among the area's larger homeless populations. (*Am J Public Health*. 1997;87:221-228)

Marjorie J. Robertson, PhD, Cheryl Zlotnick, DrPH, and Alex Westerfelt, PhD

Introduction

Reliable and detailed data on drug problems among homeless populations are rare, and prevalence estimates of drug problems vary widely. For example, based on a comprehensive review of literature on homeless adults, estimates ranged from 1% to 70%¹; a meta-analysis of population-based samples and standardized assessments produced a range between 11% and 48%²; and a review of rigorous studies reported a range of 10% to 20%.³ Yet despite this striking disparity among empirically based estimates, recent studies suggest that the prevalence of drug use and abuse among homeless persons is high, ranging from two to seven times higher than that among the general population, and that drug problems in this population are greater among men than among women.³⁻¹³

The disparity in prevalence rates is largely attributed to methodological differences including case ascertainment.^{3,14} While some researchers use standardized diagnostic criteria to identify cases, others employ highly sensitive but nonspecific screening tools, recent use, treatment histories, or even the respondent's perception of drug problems.³

Estimates are also sensitive to design characteristics, including the definition of homelessness and the sampling strategy.^{3,14-16} Probability samples are still rare.^{10,17-19} Also, many studies recruit participants from a sample site such as meal programs without screening the participants with uniform selection criteria for homelessness; consequently, the population to which findings may be generalized is often unclear.^{3,5,20} In addition, sampling frame composition may affect prevalence estimates.^{3,10,21} Shelter-based samples may underestimate while jail-based samples may overestimate

drug problems among homeless persons.^{9,10,14,16,22,23} Also, most studies report point-prevalence estimates based on cross-sectional samples that likely overrepresent individuals with longer-term homelessness,¹⁴ a potential bias that is seldom controlled for.

This study improves on previous studies by collecting a carefully designed countywide probability sample of homeless adults, screening participants with uniform selection criteria, and conducting a comprehensive assessment of drug use and related issues. With these advantages, this paper reports the prevalence and distribution of drug disorders in a countywide sample of homeless adults, examines the effects that varied instrumentation and sampling strategies have on prevalence estimates, and describes drug treatment use.

Methods

Sampling Design

The target population for the study was homeless adults in Alameda County, California, defined as persons aged 18 or older who spent the previous night (1) in an emergency shelter, (2) "on the streets" (i.e., in sites not intended for human habitation, including abandoned or public

Marjorie J. Robertson is with the Alcohol Research Group, Western Consortium for Public Health, Berkeley, Calif, and the Department of Epidemiology and Biostatistics, University of California, San Francisco. Cheryl Zlotnick is with the Alcohol Research Group. Alex Westerfelt is with the School of Social Welfare, University of Kansas, Lawrence.

Requests for reprints should be sent to Marjorie J. Robertson, PhD, Alcohol Research Group, 2000 Hearst Ave, Suite 300, Berkeley, CA 94709.

This paper was accepted October 8, 1996.
Editor's Note. See related editorial by Breakey (p 153) in this issue.

TABLE 1—Sociodemographic Characteristics^a of a Countywide Probability Sample of Homeless Adults in Alameda County, California, by Sex

	Total Sample (n = 564), ^b %	Men (n = 385), %	Women (n = 179), %
Age			
<30	21.0	17.4	33.9
30–44	58.1	58.8	55.9
≥45	20.9	23.9	10.3***
Racial/ethnic self-identification			
Black	68.7	68.1	70.9
White, non-Hispanic	21.8	23.0	17.3
Hispanic	5.6	5.2	6.9
American Indian	2.2	2.1	2.7
Asian, Filipino, Pacific Islander ^c	1.7	1.5	2.2
Marital status			
Never married	48.4	48.3	48.7
Ever married	51.6	51.7	51.3
Education level			
<12th grade	30.4	30.6	29.8
≥12th grade	69.6	69.4	70.2
Veteran status			
Veteran	31.3	39.5	1.9
Nonveteran	68.7	60.5	98.1***
Residence in county as an adult			
<12 months	15.0	13.8	19.4
≥12 months	85.0	86.2	80.6
Previously homeless			
Never	43.9	45.0	40.0
Ever	56.1	55.0	60.0
History of homelessness as an adult^d			
<6 mo	38.2	34.8	50.4
6–<12 mo	13.4	13.2	14.0
12–<18 mo	8.6	9.0	7.4
18–<24 mo	8.5	9.0	6.6
24 mo or more	31.3	34.0	21.5*
Dwelling previous night			
Shelter or streets	84.1	84.7	82.1
Hotel or doubled-up	15.9	15.3	17.9
Sample sites			
Shelter	60.5	55.9	76.6
Nonshelter	39.5	44.1	23.4***
Geographic sampling area			
Oakland	53.2	56.9	39.8
Outside Oakland	46.8	43.1	60.2***

^aPercentages are weighted; sample size is unweighted; data were collected in 1991.

^bValues for age and racial or ethnic identity are missing for four respondents.

^cCell size was too small for significance testing.

^dValues for history of homelessness are missing for 20 respondents.

* $P < .05$; ** $P < .01$; *** $P < .001$.

buildings, vehicles, or out-of-doors), (3) in a hotel or motel room paid for with a voucher, or (4) “doubled up” in homes of friends or family members (if the adult also spent at least 1 night of the previous 30 on the streets, in a shelter, or in a voucher hotel room).

The sampling frame included all sites throughout Alameda County that regularly provided free prepared meals, a strategy demonstrated previously to in-

clude the great majority of homeless persons.^{10,17,18,24–26} Such sites included emergency shelters, meal programs, and drop-in centers. However, they excluded institutional settings (e.g., jails, hospitals, residential treatment facilities) and domestic violence shelters.

The sampling design was a multi-stage cluster sample with stratification. First, from three directories of service providers we developed a composite list

of sites throughout the county that served homeless or other indigent adult clients. This list was expanded through contact with community organizations and homeless persons. Through phone interviews with 180 sites, we identified 80 sites that provided at least one free prepared meal per week to homeless adults; these sites constituted the sampling frame. We stratified sites by type of facility (shelter or nonshelter), usual number of unduplicated clients, geographic location (Oakland or outside Oakland), and whether facilities served families with children. From these we drew a computer-generated sample of sites.

Second, with a probability proportionate to size, we selected the days of the week to visit each shelter and the days and meal times to visit other sites. To avoid systematic bias, sampling opportunities included 7 days and all possible meal times. Third, we conducted systematic random sampling of individuals to be screened within each of 29 sites. Only half the adults screened in meal programs (49.4%) met study criteria for homelessness and were invited to participate. We avoided consecutive days at research sites and conducted no more than 10 interviews per day at each site to avoid disrupting services, lessen the likelihood that potential respondents would discover our sampling strategy or selection criteria, and reduce the probability of duplicate respondent selection. To further reduce duplicate recruitment,¹⁷ we decided that an individual who had stayed in a shelter within the county during the past 7 days was not eligible for recruitment at nonshelter sites.²⁷

The sampling strategy, designed to be executed within a 30-day period, was implemented four times during baseline data collection (between April 15 and August 15, 1991), resulting in a final baseline sample of 564 adults. The overall completion rate was 90.4%, with no significant differences between participants and eligible nonparticipants. Interviews averaged 1.75 hours; each respondent was paid a \$20 cash incentive to participate.

Instrumentation

Drug indicators. Drug use disorders were assessed with the Diagnostic Interview Schedule, Version III-R, a standardized structured diagnostic interview designed for use by trained nonclinicians and used previously in surveys of homeless persons.^{3,4,6,25,28–30} Diagnoses were based on criteria from the *Diagnostic and*

TABLE 2—Lifetime and Current Prevalence^a of Alcohol and Drug Use Disorders in a Countywide Probability Sample of Homeless Adults in Alameda County, California, by Sex

Substance Use Disorders	Lifetime Disorder ^b			Current Disorder ^{b,c}		
	Total (n = 564), %	Men (n = 385), %	Women (n = 179), %	Total (n = 564), %	Men (n = 385), %	Women (n = 179), %
Any substance use disorder	69.1	71.0	62.5	52.4	54.0	46.5
Both alcohol and drug use disorders	35.7	37.5	29.1	17.7	18.0	16.9
Alcohol use disorder	52.6	56.0	40.3**	38.8	40.8	31.6
Drug use disorder	52.2	52.5	51.2	31.3	31.2	31.8
Cocaine	37.3	36.5	40.1	24.5	24.3	25.5
Crack	27.1	26.2	30.4	19.3	18.7	21.1
Other cocaine	24.8	24.7	25.1	15.2	15.8	13.1
Cannabis	25.9	29.6	12.9***	14.2	15.9	8.1*
Stimulants	17.0	18.3	12.5	11.7	13.4	5.6*
Opiates	14.7	16.0	10.2	9.5	10.8	4.9*
Heroin	11.0	12.4	6.1*	7.1	8.3	2.9*
Other opiates	8.7	9.2	6.6	5.9	6.8	2.9
Sedatives	10.7	10.7	10.7	6.8	7.6	3.9
Hallucinogens	8.7	10.0	3.9*	4.4	5.7	0.0**
Phencyclidine (PCP)	2.2	2.5	1.2	0.8	1.1	0.0
Inhalants	1.0	1.3	0.0	0.9	1.1	0.0
Multiple drug disorders						
Including cannabis	48.3	49.7	43.5	31.3	31.2	31.8
Excluding cannabis	41.0	41.4	39.4	29.0	29.2	28.0

^aPercentages are weighted; sample sizes are unweighted; data were collected in 1991.

^bAccording to DSM-III-R criteria for abuse or dependence.

^c12-month recency.

* $P < .05$, ** $P < .01$, *** $P < .001$.

Statistical Manual of Mental Disorders, 3rd ed, rev (DSM-III-R).^{28,31} A drug use disorder included a diagnosis of abuse of or dependence on any of eight classes of drugs, including cannabis, stimulants, sedatives, cocaine, opiates, phencyclidine (PCP), other hallucinogens, or inhalants. Diagnoses were made using the Diagnostic Interview Schedule computer algorithm.

Respondents were classified with a *lifetime drug use disorder* if they reported enough symptoms throughout their lives related to the use of a specific class of drug (such as cocaine) to meet DSM-III-R requirements for a diagnosis of abuse or dependence. Onset was operationalized as the age at which the first DSM-III-R symptom was reported. Crack-related symptoms were collected separately from symptoms of other cocaine use, and heroin-related symptoms were collected separately from symptoms of other opiate use.

Current drug use disorder was selected as the principal indicator of drug problems for the sample since it serves as a rough proxy for treatment need in the past 12 months.³ Respondents were classified with a *current drug use disorder* if

they had a lifetime history of a specific drug use disorder and also reported a symptom of abuse or dependence related to that specific class of drug during the previous 12 months.^{32,33}

Recent drug use was operationalized as the use of any of the eight classes of drugs listed above during the previous 30 days. Lifetime and recent (12-month) injection drug use and perceived drug problems were also assessed.

Treatment history included lifetime and recent (12-month) drug treatment, recent unmet need for treatment, recent use of inpatient treatment settings as a shelter resource, and likely drug treatment sites.

Other indicators. Lifetime and current alcohol disorders were assessed using the Diagnostic Interview Schedule. Lifetime substance use disorders included a history of any lifetime alcohol or drug disorder. Current substance use disorders included any current alcohol or drug disorder. History of homelessness was operationalized by age of first episode of homelessness, total number of episodes, and total time spent homeless as an adult.

To enhance the reliability and validity of the interview data, interviewers

received more than 50 hours of classroom training and ongoing detailed feedback from editors during the data collection period.

Analysis

Weights for each respondent were calculated to adjust for varying probabilities of being selected.²⁷ SPSS was used to conduct all analyses.³⁴ The chi-square test of independence and Fisher's Exact Test were used to compare frequencies of categorical data, and independent group *t* tests were used to examine differences in continuous variables. Logistic regressions were used to identify factors associated with current drug use disorders and recent treatment contact; odds ratios (ORs) and 95% confidence intervals (CIs) are reported. Fit was judged by the comparison of the -2 log likelihood, model improvement (χ^2), and Wald statistics of the beta coefficients for each logistic equation model.³⁵

Results

Mean age of the respondents was 37.6 years (median = 37.0), and the majority were men (78.1%). Blacks consti-

TABLE 3—Prevalence^a of Current Drug Disorders^b among Subgroups of a Probability Sample of Homeless Adults in Alameda County, California, by Sex

	Total Sample		Among Men		Among Women	
	%	Dx/n ^c	%	Dx/n ^c	%	Dx/n ^c
Total sample	31.3	166/564	31.2	117/384	31.8	49/179
All ages, y						
18–29	42.8	50/139	42.7	26/74	42.9	24/65
30–44	31.4	93/316	32.1	70/223	28.7	23/93
45+	19.9**	23/108	20.9	21/87	11.7	2/21
Racial/ethnic self-identification ^d						
Black	30.4	108/359	29.3	74/243	34.5	34/116
White, non-Hispanic	35.2	40/130	35.6	29/95	33.6	11/35
Hispanic	29.0	11/37	34.8	8/21	12.5	3/16
American Indian	41.7	5/22	44.4	4/17	33.3	1/5
Veteran status						
Veteran	19.6	32/154	19.8	32/151	0.0	0/3
Nonveteran	36.7***	134/410	38.6***	85/234	32.4	49/176
Total time homeless ^e						
<6 mo	20.2	52/244	17.7	28/135	25.0	24/109
6 to <12 mo	41.9	24/67	35.7	14/47	64.7	10/20
12 to <18 mo	31.9	14/44	28.9	11/31	33.3	3/13
18 to <24 mo	45.7	14/33	47.4	11/26	37.7	3/7
24 mo or more	36.1**	57/160	38.9**	49/132	19.2*	8/28
Sampling sites						
Shelters	29.2	96/360	29.6	59/215	28.3	37/145
Other sites	34.5	70/204	33.2	58/170	43.2	12/34
Geographic sampling sites						
Inside Oakland	35.4	87/247	33.9	62/182	43.1	25/65
Outside Oakland	26.7*	79/317	27.6	55/203	24.3*	24/114

^aPercentages are weighted; sample sizes are unweighted; data were collected in 1991.

^bAccording to DSM-III-R criteria for abuse or dependence in the previous 12 months.

^cPrevalence rates for a given subgroup are calculated from the number of respondents with diagnoses (Dx) divided by number in subgroup (n).

^dFor the purposes of statistical analysis (i.e., to obtain small cell sizes), we omitted the category of "Asian, Filipino and Pacific Islander" (12 cases). Racial or ethnic identity is missing for four respondents.

^eTotal time homeless in lifetime since age 18.

* $P < .05$, ** $P < .01$, *** $P < .001$.

tuted the largest racial or ethnic group. About half the sample had been married at some point, and more than two thirds completed high school or its equivalent. Nearly one third of the sample were US military veterans. As adults, most of the respondents had lived in Alameda County for more than a year; throughout their lives, most had lived in the county for at least 10 years (median = 168 months; mean = 174 months). Although half the sample (56.1%) reported previous homelessness as adults, most (51.6%) had been homeless for less than 1 year total (median = 326.0 days; mean = 741.2 days) (Table 1). On average, respondents were age 33 (mean and median) when they first experienced homelessness as an adult.

Compared with women, men were significantly older and more likely to be veterans and to report longer histories of adult homelessness. Significantly more men were sampled from Oakland and from nonshelter sites, while more women were sampled from shelter sites and from outside Oakland (Table 1).

Substance Use Disorders Overall

About two thirds of the sample (69.1%) had a *lifetime* history of a substance use disorders (i.e., a diagnosis of abuse of or dependence on alcohol or any drug), and half of these (or 35.7% of the sample) had both alcohol and drug disorders (Table 2). About half the sample (52.4%) had *current* substance use disorders, and one third of these (or 17.7% of

the sample) had current disorders for both alcohol and drugs.

About half the sample (52.6%) had a lifetime history of alcohol use disorders, most with current alcohol diagnoses. Lifetime alcohol use disorders were significantly higher among men than among women; surprisingly, current alcohol use disorders were not.

Lifetime Drug Use Disorders

About half the sample (52.2%) met the diagnostic criteria for lifetime drug use disorders, most with multiple drug disorders regardless of whether cannabis was included. The vast majority (91.4%) reported onset of drug use disorders before their first episode of adult homelessness (mean age at onset = 22 years; median = 20 years) (not shown). Cocaine abuse was the most common lifetime drug disorder, affecting more than one third of the sample (Table 2).

Although there were few differences by sex overall, men reported significantly higher lifetime rates of heroin, hallucinogen, and cannabis disorders.

Current Drug Disorders

Overall, about one third of the sample (31.3%) had current drug use disorders, all with multiple current drug disorders. Cocaine abuse was the most common current drug disorder, affecting one quarter of the sample, and that was mostly for crack. Men and women reported virtually equivalent rates of current drug disorders overall and for most specific drugs; however, men reported significantly higher rates of cannabis, opiate, stimulant, and hallucinogen disorders (Table 2).

In bivariate analyses, current disorders were significantly higher among respondents who were younger, nonveterans, homeless longer, and recruited from Oakland. Among men, the prevalence of current disorders was significantly higher among nonveterans and those who had been homeless longer. Among women, current disorders were significantly higher among those sampled in Oakland and those who had been homeless between 6 and 24 months (Table 3).

Results from a logistic regression suggested that current drug disorders were significantly higher among respondents who were under age 35 (OR = 1.84; 95% CI = 1.25, 2.70), homeless 1 year or longer (OR = 1.80; 95% CI = 1.23, 2.63), or sampled from Oakland (OR = 1.57; 95% CI = 1.05, 2.34; $\chi^2 = 22.91$; $df = 6$). Contrary to expectation, sex, race, and

recruitment from shelters were not significantly related to current drug disorders in the model.

Other Indicators

Alcohol was the most frequent substance used in the past 30 days, reported by two thirds of the sample (68.8%). In contrast, less than half (42.9%) reported any recent drug use. Cocaine, the most frequently used drug, was reported by one quarter of the sample, mostly for crack. As expected, rates of recent alcohol use were significantly higher among men than among women; surprisingly, rates of recent drug use were not (Table 4).

About one quarter of the sample (22.3%) reported lifetime injection drug use (data not shown), with 8.9% reporting recent (12-month) injection drug use (men = 10.1%, women = 4.8%). Among drugs recently injected, heroin was reported most frequently (94.1%), followed by cocaine (58.0%), stimulants (44.6%), other opiates (19.6%), sedatives (19.0%), and hallucinogens (7.3%). Among injection drug users, mean and median ages of first drug injection were 22 years. About 29.3% of the sample perceived themselves to have had a problem with drugs during the past 12 months.

Treatment History

Among respondents with *current* drug disorders, nearly half (46.0%) had some type of drug treatment in their adult lifetimes, including one quarter with inpatient or residential treatment. However, only one quarter received recent help for drug problems (i.e., in the previous 12 months), most of which came from self-help groups or outpatient drug-treatment programs. Nearly half (43.8%) reported occasions in the past 12 months when they had needed but not received drug treatment. Few reported using a drug treatment facility as a shelter resource (Table 5). The most likely sites for future drug treatment included drug treatment programs (27.8%), self-help groups (18.4%), county hospitals (12.1%), drop-in centers (7.9%), or Department of Veterans Affairs (VA) programs (4.4%); many had no idea where to go for help (17.9%) (not shown).

There were no significant differences by sex in recent treatment contact other than private outpatient care (higher for women) and use of a drug treatment facility as a shelter resource (higher for men). Although 19.8% of male veterans had current drug disorders, only 0.8%

TABLE 4—Prevalence^a of Recent (30-Day) Alcohol and Drug Use in a Countywide Probability Sample of Homeless Adults in Alameda County, California, by Sex

	Total (n = 564), %	Men (n = 385), %	Women (n = 179), %
Any alcohol use	68.8	74.8	47.6**
Any drug use	42.9	43.8	39.4
Cocaine	25.4	25.9	23.4
Crack	20.1	20.9	17.3
Other cocaine	10.7	11.3	8.9
Cannabis	22.7	24.5	16.1*
Opiates	8.8	9.1	7.9
Heroin	5.5	6.3	2.3
Other opiates	5.3	5.0	6.2
Sedatives	4.4	4.3	4.8
Stimulants	2.2	2.5	1.3
Hallucinogens	1.4	1.8	0.0
Phencyclidine (PCP)	0.2	0.3	0.0 ^b
Inhalants	0.0	0.0	0.0

^aPercentages are weighted; sample sizes are unweighted; data were collected in 1991.

^bTested with Fischer's Exact Test.

* $P < .05$, ** $P < .001$.

TABLE 5—Drug Treatment Contact^a in a Countywide Probability Sample of Homeless Adults with Current Drug Disorders^b in Alameda County, California, by Sex^b

Type of Drug Treatment	Total (n = 166), %	Men (n = 117), %	Women (n = 49), %
In lifetime			
Any drug treatment	46.0	46.7	43.6
Inpatient or residential treatment	23.3	23.4	23.1
Inpatient drug treatment before first homelessness	14.8	14.6	15.4
In previous 12 months			
Any drug treatment	25.9	23.5	34.3
Inpatient or residential treatment	8.1	8.1	8.0
Other treatment	22.3	19.1	33.6
Self-help group	14.4	12.1	22.6
Drug treatment center	9.4	8.5	12.7
Drop-in center	6.2	5.8	7.5
Private hospital clinic	1.3	0.0	5.8*
Mental health clinic	1.1	1.5	0.0
Alcohol treatment center	1.1	0.7	2.6
Free health care in shelter or van	0.6	0.8	0.0
County hospital clinic	0.6	0.8	0.0
VA hospital/center	0.6	0.8	0.0
Free clinic office	0.5	0.5	0.8
Had unmet need for drug treatment	43.8	41.7	51.2
Used drug facility as shelter resource	10.8	13.1	2.6*

^aPercentages are weighted; sample sizes are unweighted; data were collected in 1991.

^bAccording to DSM-III-R criteria for abuse or dependence in the previous 12 months.

* $P < .05$.

reported any recent treatment contact with VA drug programs (not shown).

Results from a logistic regression suggested that respondents who had been

homeless for a year or more were about 2.6 times more likely to report recent drug treatment (OR = 2.57; 95% CI = 1.10, 5.97). Contrary to expectation, sex, age,

race, recruitment site, and perceived drug problem were not significantly related to treatment contact in the model.

Discussion

Reliable and detailed data on drug problems among homeless populations are rare. This paper presents new and important findings on substance use disorders among homeless adults; these findings have direct relevance for treatment and policy. Consistent with recent studies,³ we found a high prevalence of substance use disorders among homeless adults. About two thirds of the sample had a lifetime history of a substance use disorder (i.e., a diagnosis of abuse of or dependence on either alcohol or drugs), and half of these had both alcohol and drug disorders. Regarding alcohol, half the sample had a lifetime history of alcohol disorders, and one third had current alcohol disorders; as expected, lifetime alcohol disorders were more prevalent among men than among women.^{3,36} Regarding drugs, half the sample (52.2%) had a lifetime history of drug use disorders, and one third had current disorders (31.3%); contrary to expectation, rates were virtually equivalent for men and women.

Findings were compared with prevalence estimates for the general US population (ages 15 to 36) from the National Comorbidity Study,³⁶ in which data were collected from a comparable era with a similarly structured diagnostic interview based on DSM-III-R criteria.³⁶ Rates of substance use disorders were found to be two to eight times higher among homeless adults than among the general population; *lifetime* substance use disorders were more than two times higher (69.1% vs 26.6%) and *current* substance use disorders were more than four times higher (52.4% vs 11.3%). The rate for both alcohol and drug disorders was three times higher among homeless adults than among the general population (35.7% vs 10.8%); alcohol disorders were more than two times higher for lifetime (52.6% vs 23.5%) and were four times higher for current disorders (38.8% vs 9.7%); and drug disorders were more than four times higher for lifetime (52.2% vs 11.9%) and more than eight times higher for current disorders (31.3% vs 3.6%).

Most striking, perhaps, are differences between homeless and nonhomeless women³⁶: homeless women had rates of substance use disorders more than three

times higher for lifetime (62.5% vs 17.9%) and seven times higher for current disorders (46.5% vs 6.6%). Similarly, alcohol disorders among homeless women were nearly three times higher for lifetime (40.3% vs 14.6%) and six times higher for current disorders (31.6% vs 5.3%), and drug disorders were more than five times higher for lifetime (51.2% vs 9.4%) and more than fourteen times higher for current disorders (31.8% vs 2.2%). Findings are similar to those of a study of homeless women in St. Louis,³⁷ which reported rates for lifetime alcohol and drug disorders that were three and seven times higher, respectively, for homeless compared with nonhomeless women.

Overall rates of lifetime drug disorders were higher here than in previous studies of homeless adults that used similar diagnostic criteria (DSM-III or DSM-III-R) and produced rates that ranged from 1% to 37%.^{3,4,25,29,30,38} In particular, the rate for homeless women in this study (51.2%) was higher than the 17% to 44% reported previously for homeless women.³⁹ It is unclear from these data, however, whether higher rates here are due to geographic differences in substance use patterns,³⁶ temporal shifts in drug use patterns among homeless adults,⁴ sampling strategies, or other factors.

Historically, the estimated prevalence rates of drug disorders across studies of homeless persons have varied in part because of differences in case ascertainment and sampling strategy.^{3,4,14,21,23} As expected, we found that estimated rates within this sample varied dramatically as a function of case ascertainment. Based on *current* drug use disorders—the focus of this paper—the estimated prevalence is 31.3%. However, the estimate is 52.2% based on *lifetime* drug disorders (common in studies of homeless adults³); 42.9% based on 30-day use; 29.3% based on perceived drug problems; and 24.1% based on inpatient or residential treatment history. In sum, the estimated prevalence of drug problems within this sample ranges from one quarter to one half, depending on the method of case ascertainment.

We also tested the effect of varied sampling strategies on estimates. As expected, rates of current drug disorders varied as a function of sampling strategy and sample composition. Rates were significantly higher in the City of Oakland than in other areas of the county, even after controlling for sex, race, age, and time homeless; this suggests that studies based on samples drawn solely from

smaller geographic areas such as inner-city or urban areas may overestimate drug problems in the area's larger homeless population. Furthermore, rates were significantly higher among respondents who had been homeless longer, even after controlling for sex, race, age, and geographic area; this supports observations that studies based on cross-sectional samples likely overestimate the prevalence of drug problems among homeless populations.^{38,39}

About one quarter of the sample reported lifetime injection drug use. Less than half the sample (43%) reported recent (30-day) drug use, higher than that reported by homeless adults from the Washington, DC, metropolitan area (34%)¹⁰ but lower than that reported by sheltered adults in New Haven (54%).¹¹

Not surprisingly, cocaine was the most prominent drug reported in this sample, with most cocaine use and disorders attributed to crack. For example, one quarter of the sample (24.5%) reported a current diagnosis of cocaine abuse or dependence, and one quarter (25.4%) reported cocaine use in the previous 30 days. As early as 1985, cocaine was the "drug of choice" among sheltered homeless men in New York City (25% of whom reported cocaine use in the previous 30 days³⁸); among sheltered adults in New Haven (41%); and among literally homeless persons in the Washington, DC, area (27.5% vs 1.5% among households).^{10,11}

Consistent with earlier studies of homeless adults,^{3,9,10,25,39} we found current drug disorders to be more prevalent among those who were younger and had been homeless longer. Although findings from those previous studies are mixed, we found no significant differences in current drug disorders by racial or ethnic group. Contrary to recent studies in homeless and general populations,^{10,36} however, we found rates of drug disorders and recent drug use to be virtually equivalent for homeless men and women.

Although about one third of the sample had drug problems in the previous 12 months that were serious enough to warrant treatment, only one quarter of these respondents (25.9%) reported contact with any type of drug treatment services in the same period, and nearly half (43.8%) reported a need for drug treatment they did not get, suggesting a great unmet need for drug treatment. Although 19.8% of homeless male veterans had current drug disorders, only 0.8% reported contact with any VA drug pro-

gram or treatment facility in the past 12 months.

Readers are cautioned that findings may not generalize to homeless adults who do not use service sites described here or who live outside of Alameda County. While prevalence rates may accurately describe the extent and distribution of drug problems in this specific cross-sectional sample of homeless adults, they may overstate the extent of drug problems in the larger homeless population. Further, self-reported retrospective data are subject to recall bias while drug use and related problems are stigmatized behaviors and may be underreported. Also, the reliability and validity of diagnostic assessment of homeless populations with the Diagnostic Interview Schedule are untested. Finally, findings are only descriptive and do not address any causal relationship between drug use and homelessness.^{39,40}

Nevertheless, this study presents unusually detailed findings on drug problems reported by homeless adults who use shelters and free meal programs. Surprisingly, drug use disorders were as prevalent as alcohol use disorders. Compared with the general population, homeless adults, particularly homeless women, reported current drug disorders that were disproportionately high. Generally, onset of drug disorders preceded first homelessness. As documented earlier, cocaine—and particularly crack cocaine—figured prominently in drug use and abuse by homeless men and women.

Concerning treatment, homeless adults appear to be underserved relative to need. Those with current drug disorders usually had multiple drug disorders and comorbid alcohol disorders, complicating the clinical picture even beyond obvious differences in their economic and social resources compared with those of the general population.^{41,42} Contrary to stereotype, most of the sample were long-term local residents with at least 10 years in Alameda County. Findings here and elsewhere^{5,42} suggest that planners and policymakers should seek to close the gap between need and treatment use by increasing the availability, accessibility, and appropriateness of services to this high-risk yet underserved population.

Finally, findings demonstrated the volatility of estimates of drug problems among homeless adults as a function of case ascertainment and sampling strategy. Estimates based on samples drawn from urban or inner-city areas alone may overestimate drug problems in an area's

larger homeless population. Although not tested here, estimates of the prevalence of other health problems among homeless adults are likely to be similarly influenced by instrumentation and sampling strategies. □

Acknowledgments

This analysis was funded by the Substance Abuse and Mental Health Services Administration Cooperative Agreement SM51800, National Institute of Mental Health (NIMH) grant MH51651, and National Institute on Alcohol Abuse and Alcoholism grant AA07240.

Data collection was funded by NIMH grant MH46104.

An earlier version of this paper was presented at the annual meeting of the American Public Health Association, October 24–28, 1993, San Francisco, Calif.

The authors are grateful to anonymous reviewers for their thoughtful contributions to the article.

References

- Fischer PJ. Estimating the prevalence of alcohol, drug and mental health problems in the contemporary homeless population: a review of the literature. *Contemp Drug Probl.* 1989;16:333–389.
- Lehman AF, Cordray DS. Prevalence of alcohol, drug and mental disorders among the homeless: one more time. *Contemp Drug Probl.* 1993;20:355–383.
- Fischer PJ. Alcohol, drug abuse and mental health problems among homeless persons: a review of the literature. Rockville, Md: Department of Health and Human Services; 1991.
- Fischer PJ, Breakey WR. The epidemiology of alcohol, drug, and mental disorders among homeless persons. *Am Psychol.* 1991;46:1115–1128.
- Struening EL, Padgett DK. Physical health status, substance use and abuse, and mental disorders among homeless adults. *J Soc Issues.* 1990;46(4):65–81.
- Robertson M, Koegel P, Ferguson L. Alcohol use and abuse among homeless adolescents in Hollywood. *Contemp Drug Probl.* 1989;16:415–452.
- Fischer PJ, Breakey WR. Profile of the Baltimore homeless with alcohol problems. *Alcohol Health Res World.* 1987;2:36–37, 61.
- Koegel P, Burnam MA. Alcoholism among homeless adults in the inner city of Los Angeles. *Arch Gen Psychiatry.* 1988;45:1011–1018.
- Johnson TP, Barrett M. Substance use among homeless persons in Cook County, Illinois. Presented at the 120th Annual Meeting of the American Public Health Association; November 8–12, 1992; Washington, DC.
- Prevalence of Drug Use in the Washington, DC, Metropolitan Area Homeless and Transient Population: 1991.* Washington, DC, Metropolitan Area Drug Study. Washington, DC: US National Institute of Drug Abuse; 1993.
- Spinner GF, Leaf PJ. Homelessness and drug abuse in New Haven. *Hosp Community Psychiatry.* 1992;43:166–168.
- Welte JW, Barnes GM. Drinking among homeless and marginally housed adults in New York State. *J Stud Alcohol.* 1992;53:303–315.
- Winkleby MA, Rockhill B, Jatulis D, Fortmann S. The medical origins of homelessness. *Am J Public Health.* 1992;82:1394–1398.
- Susser E, Conover S, Struening E. Problems of epidemiologic method in assessing the type and extent of mental illness among homeless adults. *Hosp Community Psychiatry.* 1989;40:261–265.
- Robertson M, Greenblatt M. Homelessness: a national perspective. In: Robertson M, Greenblatt M, ed. *Homelessness: A National Perspective.* New York, NY: Plenum; 1992:339–349.
- Johnson TP, Mitra A, Newman R, Horn J. Problems of definition in sampling special populations: the case of homeless persons. *Eval Pract.* 1993;14:119–126.
- Burnam MA, Koegel P. Methodology for obtaining a representative sample of homeless persons: the Los Angeles Skid Row study. *Eval Rev.* 1988;12:117–152.
- Dennis ML. Changing the conventional rules: surveying homeless people in non-conventional locations. Presented at the Fannie Mae Annual Housing Conference, "Counting the Homeless: The Methodologies, Policies, and Social Significance Behind the Numbers"; May 14, 1991; Washington, DC.
- Sosin MR, Colson P, Grossman S. *Homelessness in Chicago: Poverty and Pathology, Social Institutions and Social Change.* Chicago, Ill: University of Chicago Press; 1988.
- Cordray DS, Pion GM. Counting the homeless: the methodologies, policies, and social significance behind the numbers. *Housing Policy Debate.* 1991;2:587–616.
- Robertson MJ, Westerfelt A, Piliavin I. Mental health status and service utilization among homeless adults in Alameda County. Paper presented at the 120th Annual Meeting of the American Public Health Association; November 8–12, 1992; Washington, DC.
- Fischer PJ. Estimating the prevalence of alcohol, drug and mental health problems in the contemporary homeless population: a review of the literature. *Contemp Drug Probl.* 1989;16:333–360.
- Robertson M. The prevalence of mental disorder among homeless people. In: Jahiel R, ed. *Homelessness: A Prevention-Oriented Approach.* Baltimore, Md: Johns Hopkins University Press; 1992:57–86.
- Vernez G, Burnam MA, McGlynn E, Trude S, Mittman B. *Review of California's Program for the Mentally Disabled.* Santa Monica, Calif: California Department of Mental Health and the RAND Corporation; 1988.
- Koegel P, Burnam MA, Farr RK. The prevalence of specific psychiatric disorders among homeless individuals in the inner city of Los Angeles. *Arch Gen Psychiatry.* 1988;45:1085–1092.
- Smith EM, North CS, Spitznagel EL. Are hard-to-interview street dwellers needed in assessing psychiatric disorders in homeless men? *Int J Methods Psychiatric Res.* 1991;1:69–78.

27. Piazza T, Cheng Y-T. Sample design for the study of Alameda County residents. Berkeley, Calif: University of California, Survey Research Center; 1992.
28. Psychoactive substance use disorders. *Diagnostic and Statistical Manual of Mental Disorders*. 3rd ed, rev. Washington, DC: American Psychiatric Association; 1987: 165–185.
29. Fischer PJ, Shapiro S, Breakey WR, Anthony JC, Kramer M. Mental health and social characteristics of the homeless: a survey of mission users. *Am J Public Health*. 1986;76:519–524.
30. Toro PA, Wall DD. *Assessing the Impact of Some Sampling and Measurement Methods in Research on the Homeless*. Buffalo, NY: State University of New York; 1989.
31. Robins LN, Regier DA, ed. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York, NY: The Free Press; 1991.
32. Anthony JC, Helzer JE. Syndromes of drug abuse and dependence. In: Robins LN, Regier DA, ed. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York, NY: The Free Press; 1991:116–154.
33. Helzer JE, Burnam A, McEvoy T. Alcohol use and dependence. In: Robins LN, Regier DA, ed. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York, NY: The Free Press; 1991:81–116.
34. Norusis MJ. *SPSS Advanced Statistics User's Guide*. Chicago, Ill: SPSS, Inc, 1990.
35. Hosmer DW, Taber S, Lemeshow S. The importance of assessing the fit of logistic regression models: a case study. *Am J Public Health*. 1991;81:1630–1635.
36. Kessler RC, McGonagle KA, Zhao S, et al. 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.
37. Smith EM, North CS, Spitznagel EL. Alcohol, drugs, and psychiatric comorbidity among homeless women: an epidemiologic study. *J Clin Psychiatry*. 1993;54: 82–87.
38. Bassuk EL, Rubin L, Lauriat A. Characteristics of sheltered homeless families. *Am J Public Health*. 1986;76:1097–1101.
39. Susser E, Struening EL, Conover S. Psychiatric problems in homeless men. Lifetime psychosis, substance use, and current distress in new arrivals at New York City shelters. *Arch Gen Psychiatry*. 1989;46:845–850.
40. Susser E, Conover S, Struening EL. Mental illness in the homeless: problems of epidemiologic method in surveys of the 1980s. *Community Ment Health J*. 1990;26: 391–414.
41. Robertson MJ, Winkleby MA. Mental health problems of homeless women and differences across subgroups. *Annu Rev Public Health*. 1996;17:311–336.
42. Robertson MJ, Zlotnick C, Westerfelt A. Homeless adults: a special population in public alcohol treatment programs. *Contemp Drug Probl*. 1989;16:499–519.