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The Epidemiology of Substance Use and Disorders Among Middle Aged and Elderly Community Adults: National Survey on Drug Use and Health (NSDUH)

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Abstract

Objective—To estimate the prevalence, distribution, and correlates of drug use among middle aged and elderly persons in the United States and to compare with alcohol use in this age group.

Setting—The 2005 and 2006 National Surveys on Drug Use and Health (NSDUH).

Participants—10,953 subjects 50 years of age and older (6,717 subjects 50–64 years of age and 4,236 subjects 65+ years of age).

Measurements—Social and demographic variables, detailed assessment of alcohol and drug use and disorders (marijuana, cocaine, inhalants, hallucinogens, methamphetamine, and heroin), major depression and self-rated health.

Results—Nearly 60% of subjects used alcohol during the past year, 2.6% marijuana, and 0.41% cocaine. Both alcohol and drug use were far more frequent in subjects 50–64 and among males. Drug use, in contrast to alcohol use, was not associated with education, but was more common among those not married and those with major depression. The prevalence of drug abuse or dependence in the 50+ age group was very low (only 0.33% for any abuse or dependence, 0.12% for marijuana abuse or dependence and 0.18% for cocaine abuse or dependence). Nevertheless, the use of marijuana approached 4% in the 50–64 age group in comparison to 0.7% in the 65+ age group.

Conclusions—Drug use is not prevalent, though use is much more common in the middle aged, suggesting that prevalence may rise substantially in the 65+ age group as the younger cohort ages.

INTRODUCTION

Prevalence estimates of substance use (except for alcohol) among older adults are rare in the extant literature for North America. For two large surveys, the Epidemiologic Catchment Area (ECA) study and the National Comorbidity Study Replication (NCS-R), the prevalence of drug use was very low for middle aged and older adults. In the ECA study, 7% of persons 45–64 and 1.6% of persons 65+ had a lifetime prevalence of illegal drug use. Active use of illegal drugs occurred in 0.8% of subjects 45–64 and 0.1% of older adults.¹ The original National Comorbidity Study did not include subjects older than 54 years of age but older aged subjects were included in the National Comorbidity Study Replication and illicit drug use by age group was investigated.^{2, 3} The investigators report a dramatically greater use of these substances for younger birth cohorts than older ones. When populations other than the community are assessed, however, the estimates may increase dramatically. For example, in a study of substance abuse by offenders in prison, seventy-one percent reported substance abuse problems. Most of these abused alcohol and they had abused illicit drugs for decades. Over

one-third had never received treatment.⁴ In another study of elders referred to a hospital substance abuse consultation service, older adults, compared to younger adults, were more likely to use alcohol and less likely to be injection drug users and heroin, cocaine, or polysubstance users. Even so, the authors suggest that the one percent of hospital admissions underestimated the problem of substance use disorder in this population.⁵

Differences do arise between older and younger users of substances who are admitted to substance abuse treatment facilities. Older admissions tended in one study to come from a more stable environment in terms of income and marriage stability and were rarely referred by healthcare workers.⁶ Substance abuse is often identified initially when patients present with medical problems secondary to or a direct result of substance use.⁷

Nevertheless, concern has been expressed about the potential for prevalence to increase markedly with the aging of the baby boom generation.⁸ That is, the aging of the baby-boom cohort in the US, with its relatively large size and high rates of substance use, will place increasing demands on the substance abuse treatment system in the next two decades. The number of older adults needing treatment is estimated to increase from 1.7 million in 2000 and 2001 to 4.4 million in 2020.

Some may claim that the propensity for substance use decreases markedly with age due to “maturing out” (which may or may not be the case), increasing mortality, and changes in drug metabolism. Some factors, however, may increase risk such as isolation, losses, and loneliness.⁹ What may happen in many instances, however, is that elders who have long used illegal drugs move to excessive use of prescription medications.¹⁰ Yet the relatively heavy use of substances earlier in life in the current young and middle aged cohorts may continue to late life and therefore we might expect to see, as suggested by Gfroerer, higher use in these younger cohorts as they age compared to older cohorts.⁸

In this study we present the prevalence and distribution of alcohol and drug use as well as abuse/dependence in a nationally representative sample of 50+ year olds, about 40% of whom are 65+ years of age, from the National Survey on Drug Use and Health (NSDUH). We combine two years (2005 and 2006) of data to increase the sample size. Given that substance use among later middle aged and older adults is predicted to increase over time and the aging of the baby boomer population,¹¹ we document self-reported use of drugs (i.e., marijuana, cocaine, inhalants, hallucinogens, methamphetamine, and heroin) and alcohol (as a comparison). Next, we explore the association of substance use with demographic and selected mental health variables. We explore the risk of substance use in adjusted analyses from major depression and self-report fair to poor health status. Finally, we estimate the prevalence of past year substance use disorders (abuse or dependence) among all respondents and among the subset of respondents who reported the use of the substance in the past year.

METHODS

Sample

This study is based on data from the public use files of the 2005–2006 National Surveys on Drug Use and Health (NSDUH)^{12, 13} The annual survey provides population estimates of substance use and health status of the civilian, non-institutionalized population aged 12 years or older in the United States. Target participants were selected for participation utilizing multistage area probability sampling methods. The sample included household residents; residents of shelters, rooming houses, college dormitories, migratory workers’ camps, and halfway houses; and civilians residing on military bases. Approximately 2% of the US population, including active military personnel, residents of institutional group quarters (e.g., prisons, nursing homes, mental institutions, and long-term hospitals), and homeless persons

not living in a shelter on the survey date were excluded. The methods for survey sampling and data collection are the same for both years of the survey, so we have combined the two years in order to increase power.

Participants were interviewed in private at their places of residence. Confidentiality was stressed in all written and oral communications with potential respondents and respondents' names were not collected with the data. The data collection method involved the combination of computer-assisted personal interviewing (CAPI) and audio computer-assisted self-interviewing (ACASI) in order to increase the validity of respondents' reports of drug use behaviors.¹⁴ Demographic items were administered by the field interviewer via CAPI. The interview then was transitioned to the ACASI mode, which provided respondents with a highly private and confidential setting in which to answer sensitive questions (e.g., use of alcohol and other drugs). Specifically, questions were displayed on a computer screen and read through headphones to respondents who entered answers directly into the computer.

A total of 68,308 respondents completed the survey in 2005, and 67,802 respondents completed the survey in 2006. Weighted response rates for interviewing were 76% in 2005 and 74% in 2006. The study sample for each annual, independent survey is considered representative of the U.S. general population aged 12 or older. NSDUH design and data collection procedures are reported in detail elsewhere.^{12, 13} We combined the de-identified public use data files from the two survey years, analyzed data from the same questionnaire items of the two years, and restricted our analyses to the 10,953 subjects 50 years of age and older (6,717 subjects 50–64 years of age and 4,236 subjects 65+ years of age). The sample size of each age year (e.g., subjects 64 years of age) was not available from the public-use data files. Demographic characteristics of the sample are presented in Table 1.

Study Variables

Social and demographic variables—We examined respondents' age, sex, race/ethnicity, educational level, current marital status, current employment status, annual family income, and the population density of the area in which the respondent resided. Population density was classified into large metropolitan areas (population ≥ 1 million), small metropolitan areas (population < 1 million), and non-metropolitan areas (outside a standard metropolitan statistical area).¹³ We also created a categorical survey year variable in order to examine yearly variations in the distribution of demographic and substance use variables.

Substance use variables—The NSDUH assessments of alcohol and drug use included a detailed verbal description of each drug group and lists of qualifying drugs. It employed a series of separate questions to assess respondents' lifetime and past year use of alcohol, marijuana/hashish, cocaine (including crack), inhalants, hallucinogens (including LSD, PCP, peyote, mescaline, psilocybin, and MDMA/Ecstasy), methamphetamine, and heroin. For example, under the marijuana use section, the interview began with the following feeder questions. "The next questions are about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked—either in cigarettes called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called *hash*. It is usually smoked in a pipe. Another form of hashish is hash oil." Then the respondents were asked "Have you ever, even once, used marijuana or hash?" and "How long has it been since you last used marijuana or hashish?" Inhalant use was defined as sniffing or inhaling substances (e.g., liquids, sprays, and gases) "for kicks" or to "get high."¹⁵ The survey included a comprehensive list of inhalant substances, including correction fluid, degreaser, cleaning fluid, gasoline, lighter fluid, glue, shoe polish, toluene, ether, halothane, other anesthetics, lighter gases, butane, propane, nitrous oxide whippets, spray paints, lacquer thinner and other paint solvents, amyl nitrite, poppers, rush, locker room deodorizers, and aerosol sprays.¹⁵

In this report, we focused on the use of six drug classes (i.e., marijuana/hashish, cocaine/crack, inhalants, hallucinogens, methamphetamine, and heroin) and alcohol within the past 12 months preceding the interview (recent or active use). We did not focus on the non-prescription use of prescription medications. This definition of drug use did not include non-medical use of prescription drugs (prescription stimulants, pain relievers, sedatives, and tranquilizers), which was counted as drug use in the NSDUH report.¹³ We compared the use of the substance at least once (i.e., any use in the past year) with those who reported three or more days of substance use. The differences in prevalence results were minimal and there was no change in the direction of the results for logistic regression models. Therefore we have chosen to present the data for any use.

Substance use diagnosis variables—Past year alcohol or drug use disorders (abuse or dependence) were specified by DSM-IV criteria.^{15, 16} The following four abuse criteria were included: (1) a serious problems at home, work, or school caused by using the substance; (2) regular consumption of the substance that put the user in physical danger; (3) repeated use of the substance that caused the user to get in trouble with the law; and (4) problems with family or friends caused by the continued use of the substance. The following seven dependence criteria were assessed: (1) spending a great deal of time over a period of a month getting, using, or getting over effects of the substance; (2) using the substance more often than intended or being unable to maintain limits on use; (3) using the same amount of the substance with decreasing effects, or increasing use to get the same desired effects as previously attained; (4) withdrawal; (5) inability to reduce or stop the substance use; (6) continued the substance use despite problems with emotions, nerves, or mental or physical health; (7) and reduced involvement or participation in important activities because of the substance use. We created a categorical drug use disorder that included any abuse or dependence resulted from the use of marijuana, inhalants, cocaine/crack, hallucinogens, stimulants (including methamphetamine and other psychostimulants), or heroin in addition to exploring the different drugs separately, realizing that risk factors may be different across these different drug classes.

Mental health and self-rated health variables—Assessment of *major depressive episodes* was based on DSM-IV criteria¹⁶ and adapted from the depression section of the National Comorbidity Survey-Replication.¹³ The NSDUH assessed nine criteria of major depressive episodes: depressed mood most of the day, markedly diminished interest or pleasure in all or almost all activities most of the day, changes in appetite or weight, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness, diminished ability to concentrate or make decisions, and recurrent thoughts or plans for suicide. Adults who had ≥ 5 criterion symptoms in their lifetime and who also reported that they had a period of depression lasting two weeks or longer while also having some of the symptoms mentioned during the past 12 months were classified as having a past year major depressive episode. In NSDUH, no exclusions were made for major depressive episode caused by medical illness, bereavement, or substance use disorders. Respondents' *self-rated overall health* was dichotomized (excellent/good vs. fair/poor).

Data Analysis

We first examined all study variables listed in Table 1 and the prevalence of each category of substance use by survey year (N = 5,123 in 2005; N = 5,830 in 2006). We found no significant yearly differences in each of these variables. We then examined the distribution of study variables and the prevalence of substance use in the combined data (N = 10,953) and analyzed patterns of substance use separately for each substance and examined bivariate associations with χ^2 tests. We conducted logistic regression procedures with SUDAAN software¹⁷ to identify the characteristics associated with respondents' past year use of alcohol, marijuana, or cocaine. Due to a small sample size of past year users of inhalants (n = 10), hallucinogens

(n = 14), methamphetamine (n = 12), and heroin (n = 5), logistic regression procedures were not conducted for these drugs. We report odds ratios of each covariate from the adjusted logistic regression models that denote the estimated strengths of an association between a covariate and the substance use variable. Finally, we examined the prevalence of abuse and dependence among all respondents and among the subset of respondents who reported use of the substance in the past year. All estimates presented here are weighted except for sample sizes, which are unweighted.

RESULTS

Nearly 60% of respondents used alcohol during the past year, 2.6% used marijuana, and 0.41% used cocaine (Table 2). Fifteen percent of past year drug users in this sample had used two or more drugs in the past year. Among those who used alcohol or a drug in the past year, a relatively high proportion of users had used the substance 30 or more days (e.g., 49% of marijuana users and 57% of cocaine users).

Alcohol use was more prevalent in the 50–64 age group, males, whites, the more educated, those married, the employed, those with higher incomes, and those in large metropolitan areas (Table 3). The use of marijuana and cocaine was also more prevalent in the 50–64 age group and in males. In contrast with alcohol use, drug use was more common in the non-married. Major depression was associated with a lower prevalence of alcohol use but with a higher prevalence of marijuana use. Alcohol use was more prevalent in those who rated their health as excellent/good, but self-rated health was not associated with drug use. Data are presented in Table 3 for inhalants, hallucinogens, heroin, and methamphetamine for reference. The overall proportion of subjects reporting use of these drugs, however, is so small that these estimates are considered unstable in terms of association.

In Table 4, adjusted odds for alcohol, marijuana, and cocaine use are presented for demographic variables, history of major depression during the past year, and self-rated health status. Those subjects who used alcohol, marijuana and cocaine were more likely to be 50–64 years of age and male. In contrast to those who used alcohol, those who used marijuana and cocaine were more likely to be separated, divorced, or widowed vs. married, and to have major depression in the past year. Whites and Hispanics were more likely to use alcohol than African Americans, while African Americans were more likely to use alcohol and marijuana than Asian/Pacific Islanders/Native Hawaiians and to use cocaine than Whites. To explore age-related variations in sex, employment status, and self-rated health, we checked interactions for age group and each of these variables. None of these interactions were significant.

In Table 5, we present estimates of the prevalence of substance use disorders (not simply substance use). Alcohol use disorder prevalence estimates were nearly 3%, and nearly 5% among those who used alcohol during the past year. Therefore the risk of alcohol use disorder is relatively low among those who use alcohol. The same is true for marijuana use.

CONCLUSIONS

Nearly 60% of subjects used alcohol during the past year, 2.6% marijuana, and 0.41% cocaine (other use reported was very rare in this age group). Both alcohol and drug use were more frequently used in subjects 50–64 than in those 65+ years of age. In fact, the prevalence among the 50–64 age group far greater than the 65+ age group, suggesting perhaps that we may be now observing the trend for increased use among the baby boom population as they age predicted by Gfroerer et al.⁸ We also found drug use more prevalent among males (marijuana and cocaine use) and among those who are not employed (cocaine use).

Drug use, in contrast to alcohol use, was not associated with education and was more common among those not currently married (single, separated, divorced, or widowed), and those with major depression. The prevalence of drug use disorder in the 50+ age group was very low (only 0.33% for any drug abuse/dependence, 0.12% for marijuana abuse/dependence, and 0.18% for cocaine abuse/dependence). Nevertheless, the use of marijuana approached 4% in the 50–64 age group in comparison to 0.7% in the 65+ age group. Subjects who used cocaine were at a far greater risk for abuse/dependence (44%) than for subjects who did not use cocaine, but used alcohol or marijuana.

These findings should be interpreted with some caution. First, the cross-sectional nature of our data precludes drawing causal inference related to the associations we have reported. Second, substance use behaviors are obtained from respondents' self-reports, which are subject to a variety of biases associated with memory errors and under-reporting.¹⁸ For example, among emergency department patients, excess undeclared drug use was more common in the elderly (65+).¹⁹ Most of the undeclared use (as tested by saliva and urine screens) was for opioids (2.5% vs. 14.4% in females, 2.4 vs. 11.6% in males), benzodiazepines (10.0% vs. 23.7% in females, 4.3 vs. 11.9% in males), stimulants (0.0% vs. 19.8% in females, 0.0 vs. 6.7% in males), and marijuana (no difference in females, 0.7 vs. 2.4 % in males).

Finally, individuals who were institutionalized (e.g., in jails or long-term hospitals) or homeless on the date of the survey, as well as active military personnel, are not covered by the NSDUH sampling. These findings thus do not apply to them and some settings may contain a higher prevalence of drug use than the community. For example, older adults in one study living in public housing had a higher prevalence of substance abuse/dependence than older adults in the general population (4.4% one-month and 23.0% lifetime).²⁰ In another study of VA mental health inpatients and outpatients, rates of dual diagnosis declined significantly as the age of the respondents increased (26.7% of patients < 65 and 6.9% for those ≥ 65).²¹ Even so, among all the mental health patients, 3.7% of the 74+ age group, 5.8% of 65–74 age group, 12.2% of the 55–64 age group, and 11.2% of the under 55 age group had a substance abuse only disorder. Nonetheless, it is worthy noting that previous community-based research has shown that the inclusion of institutionalized individuals in large-scale surveys does not change substantially the overall population estimates of drug use disorders because of the small numbers of individuals in these subgroups relative to the large size of the U.S. household population.¹

Despite these limitations, the NSDUH design has many strengths. The large number of respondents provides one of the largest samples of substance use among late middle aged and elderly subjects living in the community. The response rate is certainly respectable given the current state of community based survey research. The probes assessing use and abuse are quite detailed given the focus of the survey. Finally, the survey used the most advanced audio computer-assisted self-interviewing technology to assess respondents' substance use behaviors, a technology that has been found to increase reporting of sexual and drug use behaviors¹⁴.

In conclusion, data from the NSDUH suggest that the prevalence of drug use among the 65+ age group is very low. However, the much greater prevalence in the 50–64 age group could be a portent of much higher use of these drugs as the baby boom cohort ages. These trends should be watched closely and the availability of yearly NSDUH data makes this possible.

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Table 1

Selected demographic characteristics of adults aged 50 or older in 2006 (N = 10,953)

	Sample size, N	Percent, %
Age in years		
50–64	6717	59.9
65 or older	4236	41.1
Sex		
Male	4952	46.1
Female	6001	53.9
Race/ethnicity		
White	8551	77.9
African American	997	9.6
American Indian or Alaska Native	121	0.4
Asian, Pacific Islander, or Native Hawaiian	258	3.2
Multiple race	217	1.1
Hispanic	809	7.8
Educational status		
Less than high school	2030	18.1
High school graduate	3705	32.4
College or more	5218	49.5
Marital status		
Married	6844	64.1
Separated, divorced, or widowed	3442	30.7
Never married	667	5.3
Current employment		
Employed	5623	50.0
Not employed	5330	50.0
Total annual family income		
\$0 – \$39,999	5067	43.8
\$40,000 – \$74,999	3218	28.9
\$75,000+	2668	27.3
Population density		
Large metro areas	4379	50.0
Small metro areas	5334	41.9
Non-metro areas	1240	8.2
Past year major depressive episode		

	Sample size, N	Percent, %
Yes	601	4.9
No	10259	95.1
Self-rated health status		
Excellent/good	8687	79.9
Fair/poor	2262	20.1
Survey year		
2005	5123	49.1
2006	5830	50.9

Sample sizes are unweighted numbers; proportions are weighted figures.

Table 2
Self-reported alcohol and drug use and prevalence of use among adults aged 50 or older in 2005–2006 (N = 10,953)

Pattern of use in the past year	Alcohol	Marijuana	Cocaine	Inhalants	Hallucinogens	Meth-amphetamine	Heroin
One-year prevalence, % (SE) ¹	59.98 (0.56)	2.57 (0.18)	0.41 (0.07)	0.11 (0.04)	0.10 (0.04)	0.11 (0.04)	0.05 (0.03)
Total number of days using the substance in the past year among users, % (SE)							
1–2	5.82 (0.35)	13.95 (3.91)	16.32 (6.48)	....	29.81 (14.21)	....	....
3–11	18.18 (0.51)	20.90 (2.89)	7.57 (4.67)	44.57 (18.57)	11.47 (8.15)	36.81 (15.73)	....
12–29	14.13 (0.51)	15.98 (3.02)	18.82 (6.86)	6.68 (6.71)	34.81 (17.77)	....	....
30 or more days	61.87 (0.73)	49.17 (4.32)	57.29 (10.44)	48.75 (19.06)	23.91 (11.35)	63.19 (15.73)	100 (0)
Mean number of days using the substance in the past year (SE) ²	103.53 (1.91)	81.23 (8.52)	100.94 (20.61)	40.92 (15.94)	17.42 (5.29)	96.13 (30.78)	300.97 (32.22)

¹ Estimates among all respondents aged 50 or older.
² Estimates among the subset of respondents who reported the use of that substance in the past year.
.....Estimates not available because of zero cells.

Table 3
One-year prevalence of self-reported alcohol and drug use (row %) among adults aged 50 or older in 2005–2006 (N = 10,953)

Prevalence, % (SE)	Alcohol	Marijuana	Cocaine	Inhalants	Hallucinogens	Meth-amphetamine	Heroin
Age in years							
50–64	65.62 (0.74) ^c	3.89 (0.26) ^c	0.68 (0.13) ^c	0.13 (0.06)	0.17 (0.09)	0.18 (0.07)	0.08 (0.05)
65 or older	51.92 (0.99)	0.69 (0.20)	0.04 (0.03)	0.07 (0.06)	....	....	....
Sex							
Male	65.97 (0.79) ^c	3.95 (0.33) ^c	0.73 (0.14) ^c	0.19 (0.07)	0.16 (0.07)	0.15 (0.07) ^b	0.09 (0.06)
Female	54.86 (0.75)	1.39 (0.19)	0.14 (0.05)	0.04 (0.04)	0.05 (0.03)	0.07 (0.04)	0.01 (0.01)
Race/ethnicity							
White	63.65 (0.66) ^c	2.56 (0.21) ^c	0.24 (0.06)	0.11 (0.04)	0.11 (0.04)	0.12 (0.05)	....
African American	43.86 (1.79)	3.78 (0.73)	1.56 (0.43)	0.24 (0.24)	0.06 (0.06)	....	0.05 (0.04)
American Indian or Alaska Native	42.04 (6.59)	5.29 (2.04)	4.14 (2.03)	....	2.19 (1.48)	....	....
Asian, Pacific Islander, or Native Hawaiian	42.55 (4.91)	0.34 (0.32)	....	....	0.07 (0.07)	....	....
Multiple race	52.64 (4.91)	3.20 (1.43)	0.28 (0.21)	....	0.09 (0.09)	....	....
Hispanic	52.24 (2.30)	1.88 (0.68)	0.68 (0.40)	....	....	0.15 (0.14)	0.54 (0.38)
Educational status							
Less than high school	36.90 (1.23) ^c	2.19 (0.41)	0.55 (0.17)	0.17 (0.14)	0.01 (0.01)	0.11 (0.07)	....
High school graduate	55.35 (1.15)	2.36 (0.26)	0.34 (0.09)	....	0.09 (0.04)	0.09 (0.05)	0.01 (0.01)
College or more	71.46 (0.79)	2.85 (0.28)	0.42 (0.13)	0.16 (0.07)	0.15 (0.06)	0.12 (0.06)	0.08 (0.06)
Marital status							
Married	63.14 (0.67) ^c	1.94 (0.20) ^b	0.13 (0.04) ^b	0.06 (0.04)	0.05 (0.03)	0.06 (0.03)	0.01 (0.01)
Separated, divorced, or widowed	54.04 (1.11)	3.43 (0.35)	0.83 (0.16)	0.03 (0.03)	0.16 (0.08)	0.17 (0.10)	0.07 (0.07)
Never married	56.14 (2.71)	5.23 (1.08)	1.43 (0.60)	1.15 (0.52)	0.42 (0.32)	0.34 (0.28)	0.39 (0.40)
Current employment status							
Employed	69.00 (0.76) ^c	3.21 (0.25) ^c	0.35 (0.08)	0.06 (0.04)	0.13 (0.05)	0.13 (0.06)	0.04 (0.04)

Prevalence, % (SE)	Alcohol	Marijuana	Cocaine	Inhalants	Hallucinogens	Meth-amphetamine	Heroin
Not employed	50.97 (0.86)	1.94 (0.23)	0.48 (0.24)	0.16 (0.07)	0.07 (0.05)	0.09 (0.04)	0.05 (0.04)
Total annual family income							
\$0 – \$39,999	46.23 (0.75) ^c	2.57 (0.18)	0.66 (0.14)	0.09 (0.06)	0.12 (0.06)	0.09 (0.05)	0.11 (0.07)
\$40,000 – \$74,999	66.18 (1.00)	2.66 (0.32)	0.25 (0.08)	0.08 (0.05)	0.10 (0.05)	0.16 (0.08)	...
\$75,000+	75.50 (1.03)	2.58 (0.36)	0.20 (0.09)	0.17 (0.09)	0.07 (0.06)	0.09 (0.07)	...
Population density							
Large metro areas	64.62 (1.00) ^c	2.86 (0.26)	0.46 (0.10)	0.20 (0.08)	0.12 (0.06)	0.18 (0.07)	0.10 (0.06)
Small metro areas	57.05 (0.86)	2.33 (0.26)	0.40 (0.17)	0.02 (0.02)	0.09 (0.04)	0.03 (0.02)	...
Non-metro areas	46.68 (1.67)	2.07 (0.47)	0.25 (0.14)	....	0.01 (0.01)	0.09 (0.09)	...
Major depressive episode							
Yes	54.43 (2.41)	6.54 (1.32) ^b	1.97 (0.77)	0.30 (0.31)	0.67 (0.46)	0.28 (0.20)	0.44 (0.44)
No	60.34 (0.59)	2.38 (0.18)	0.34 (0.06)	0.10 (0.04)	0.07 (0.03)	0.10 (0.04)	0.03 (0.02)
Self-rated health status							
Excellent/good	65.39 (0.64) ^c	2.57 (0.20)	0.35 (0.08)	0.12 (0.05)	0.10 (0.04)	0.10 (0.04)	0.06 (0.04)
Fair/poor	38.62 (1.26)	2.60 (0.41)	0.65 (0.15)	0.07 (0.07)	0.13 (0.10)	0.12 (0.07)	...

Sample sizes are unweighted numbers; proportions are weighted figures.

.....:Estimates not available because of zero users; estimates for use of inhalants, hallucinogens, methamphetamine, and heroin are considered unstable due to small sample sizes of users.

SE: Standard errors.

χ^2 test: Significance level of was set conservatively to $p = 0.01$ due to multiple comparisons;

^b $p \leq 0.01$

^c $p \leq 0.001$. The df for race/ethnicity is 5; the df for education, family income, marital status, and population density is 2; and the df for the remaining variables is 1.

Table 4

Adjusted odds ratios (AOR) and 95% Confidence Intervals (CI) of past year use of alcohol, marijuana, and cocaine use among adults aged 50 or older in 2005–2006 (N = 10,953)

Past year use	Alcohol use ^I		Marijuana use ^I		Cocaine use ^{I,2}	
	AOR	95%CI	AOR	95%CI	AOR	95%CI
Logistic regression model						
Age in years						
50–64 vs. 65 or older	1.24*	1.10–1.40	6.32*	3.32–12.03	20.58*	4.69–90.29
Sex						
Male vs. female	1.50*	1.35–1.66	3.39*	2.28–5.04	8.20*	3.19–21.06
Race/ethnicity						
White vs. African American	1.92*	1.60–2.29	0.90	0.58–1.40	0.19*	0.09–0.42
American Indian or Alaska Native vs. African American	1.16	0.61–2.18	1.40	0.53–3.69	....	....
Asian/Pacific Islander/Native Hawaiian vs. African American	0.55*	0.35–0.86	0.10 [†]	0.01–0.74	....	....
Multiple race vs. African American	1.28	0.79–2.07	0.94	0.31–2.87	....	....
Hispanic vs. African American	1.58*	1.17–2.14	0.51	0.21–1.20	0.43 [§]	0.16–1.17
Educational status						
Less than high school vs. college or more	0.41*	0.36–0.48	1.01	0.60–1.70	....	....
High school graduate vs. college or more	0.66*	0.58–0.76	0.98	0.67–1.42	....	....
Marital status						
Separated, divorced, or widowed vs. married	1.08	0.96–1.23	2.40*	1.64–3.52	7.55*	3.65–15.65
Never married vs. married	0.98	0.75–1.29	2.07*	1.26–3.40	6.88*	2.11–22.45
Current employment status						
Not employed vs. employed	0.81*	0.72–0.92	1.04	0.77–1.40	2.22*	1.29–3.83
Total annual family income						
\$40,000 – \$74,999 vs. \$0 – \$39,999	1.48*	1.32–1.67	0.87	0.56–1.34	....	....

Past year use	Alcohol use ¹	Marijuana use ¹	Cocaine use ^{1,2}
\$75,000+ vs. \$0 – \$39,999	1.71*	0.70	0.43–1.13
Population density			
Large metro areas vs. non-metro areas	1.91*	1.54	0.87–2.73
Small metro areas vs. non-metro areas	1.40*	1.22	0.69–2.16
Past year major depressive episode			
Yes vs. no	0.90	2.18*	1.29–3.68
Self-rated health status			
Excellent/good vs. fair/poor	1.90*	1.09	0.72–1.65

Wald chi-square tests:

[†] p-values < 0.05;

* p-values ≤ 0.01; the df for race/ethnicity is 5; the df for education, family income, marital status, and population density is 2; and the df for the remaining variables is 1.

¹ Each model included variables listed under that given column.

² Due to the small sample of cocaine users, only variables found to be associated with cocaine use were included in the adjusted model.

[§] Hispanics, American Indian, Alaska Natives, Asians, Pacific Islanders, Native Hawaiian, and persons reporting multiple race were combined into one group (df = 3 for the race/ethnicity variable).

Table 5 Past year prevalence of alcohol and drug use disorders (abuse or dependence) among adults aged 50 or older in 2005–2006 (N = 10,953)

Prevalence	Alcohol use disorder	Any drug use disorder ²	Marijuana use disorder	Cocaine use disorder	Inhalant use disorder	Hallucinogen use disorder	Stimulant use disorder ³	Heroin use disorder
1	2.98 (0.21)	0.33 (0.07)	0.12 (0.04)	0.18 (0.05)	....	....	0.01 (0.01)	0.05 (0.03)
Past year users n = 6564		318	290	57	10	14	12	5
4.97 (0.34)		11.71 (2.47)	4.52 (1.41)	43.89 (7.54)	....	3.08 (2.46)	12.55 (6.81)	98.68 (0.93)

Weighted numbers; proportions are weighted figures.

/available.

in disorder among past year users of that given substance.

users from any one of the following drugs: marijuana, inhalants, cocaine, hallucinogens, stimulants/methamphetamine, and heroin.

and methamphetamine users only. Assessment of stimulant use disorders was under the broad category of any stimulant use disorder that included methamphetamine and other