ESTIMATING THE NEED FOR TREATMENT FOR
SUBSTANCE ABUSE AMONG ADULTS IN MINNESOTA:

2004/2005 MINNESOTA TREATMENT NEEDS ASSESSMENT SURVEY
FINAL REPORT

Submitted to:

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MINNESOTA TREATMENT NEEDS ASSESSMENT SURVEY

For purposes of planning and applying for grants from the federal government and various foundations, the Minnesota Department of Human Services (DHS) requires timely and precise estimates of the number and proportion of the population that needs treatment for abuse of or dependence on alcohol or other drugs. DHS relies on the *Minnesota Student Survey* to estimate need among adolescents and community household surveys to estimate need among adults. Since the last adult household survey was conducted in 1996-1997, a new survey was needed in order to produce current estimates for adults.

This report presents the results of the 2004/2005 Minnesota Treatment Needs Assessment Survey conducted for DHS by the University of Minnesota School of Public Health, Division of Health Services Research and Policy. The primary objective of this project is to obtain current estimates of the number of adults in the general population in Minnesota who are abusing or dependent on alcohol or other drugs and are in need of treatment. The prevalence of substance abuse and dependence and need for treatment were assessed for the total population, and by region, race and ethnicity, gender, age group, and immigration status (US born vs. foreign born). The prevalence of comorbid substance use and mental health disorders was also assessed. Need for treatment is defined as meeting the diagnostic criteria for abuse or dependence or having received specialty treatment for substance use disorders in the past year. Unmet need is estimated by assessing the number of persons who have a substance use disorder but have not received specialty treatment services.

The population for this survey included Minnesota residents 18 years of age or older and non-institutionalized. The study was conducted between October 2004 and June 2005, and involved a random digit dial telephone survey with 16,891 adults in Minnesota. The sample was stratified by region, and African Americans, American Indians, Latinos, Hmong and other Asian Americans were oversampled to ensure adequate numbers of respondents to provide reliable estimates for these sub-groups. The survey instrument included demographic information, diagnostic measures of abuse of and dependence on alcohol or drugs, use of treatment services, depression, serious mental illness and body weight. The survey was administered in both English and Spanish. The weighted response rate was 55%, with a cooperation rate of 67%

The following are some of the study's major findings:

Cigarette Use

- 47% of adults in Minnesota have smoked cigarettes in their lifetime; 23% smoked in the past month.

- Use of cigarettes is significantly associated with gender, age, racial and ethnic status, immigration status, and region. Of note, men, American Indians and persons born in the US

have higher lifetime and past month rates of smoking than do women, persons from other racial or ethnic groups or those not born in the US. The lifetime prevalence of smoking is highest in the Northeast compared to other regions.

- The relationship between cigarette use and age is more complex. Whereas, older persons are more likely than young persons to have smoked in their lifetimes, younger persons are more likely to be current smokers.

Alcohol Use

- Overall, approximately 81% of Minnesota adults have used alcohol in their lifetimes, 71% used in the past year, and 60% had at least one drink in the past month.

- Just over one third of the population (35%) acknowledge binge drinking in the past year (4+ drinks for women, 5+ drinks for men on one occasion), just under one fifth (19%) report binge drinking in the past month, and 4% report heavy drinking (4+ drinks for women, 5+ drinks for men on at least 5 occasions in the past 30 days) in the past month.

- Males, younger persons and non-immigrants have higher rates of all types of drinking than their female, older and immigrant counterparts. Whereas rates of lifetime, past year, and past month use of alcohol are highest among whites, rates of binge drinking are highest among American Indians.

- Alcohol use is alarmingly high among those not yet of legal age to drink (18 to 20) with 58%, 52%, and 39% reporting lifetime, past year, and past month use, respectively.

Illegal Drug Use

- The drug most commonly used by Minnesota adults is marijuana; almost 40% of the population reported that they have used it in their lifetime and 7% indicated use in the past month.

- Powder cocaine and hallucinogens have been used by about 10% of the population at some point in their lives while just above 8% have used "other stimulants."

- Rates of illegal drug use are generally higher among males, American Indians, non-immigrants, and those living in the Metro region.

- Lifetime use of illegal drugs is similar for persons 18 through 64 but was substantially lower for persons 65 years of age and older. In contrast, past year use of illegal drugs was substantially higher for persons aged 18 to 24 (24% if marijuana is included in the rate and 9% if it is excluded) compared to other age groups.

Non-Medical Use of Prescription Drugs

- Overall, about 9% of Minnesota adults have used prescription drugs for non-medical reasons in their lifetimes. Combining all medications, approximately 3% of the population has misused prescription medications in the past year.

- Just over 6% of the population used pain relievers, 4% tranquilizers, and 4% sedatives for non-medical reasons in their lifetimes.

- Men and younger persons are more likely than women and older persons to misuse prescription drugs. Misuse of prescriptions drugs is generally higher among American Indians and people who identify as being of multiple races and lower among the White population. While the sample size for Asian is too small to present reliable estimates, rates of misuse of prescription drugs also appear to be quite low compared to other racial and ethnic groups. Rates are higher in the Metro region compared to other regions in Minnesota.

- About 1% of those reporting non-medical use of prescription medications have received their drugs by way of the Internet.

Substance Abuse and Dependence

- Using standard diagnostic measures of substance abuse and dependence, the survey shows that approximately 8%, or 329,900 adult Minnesotans, meet the criteria for a past year alcohol abuse or dependence diagnosis; 3% with alcohol dependence and 5% with alcohol abuse.

- Disorders with use of illegal drugs are less common than alcohol disorders. Less than 1% of Minnesotans meet the criteria for drug abuse and 1.7% meet the criteria for drug dependence.

- Rates of substance abuse or dependence are highest among men and younger persons.

- The observed associations between respondent age and gender and the existence of substance abuse disorder remain significant, albeit at diminished levels, after controlling for other demographic variables

- Of those with a substance use disorder, only 7% received specialty treatment in the past year

Need for Substance Abuse Treatment

- Treatment need is defined as meeting the criteria for substance abuse or dependence in the past year or having used specialty treatment services in the past year.

- Over 9% of the adult population, or approximately 387,600 Minnesotans, are estimated to be in need of substance abuse treatment with just over 8% and 2% needing treatment for alcohol and drugs, respectively.

- Males are more than twice as likely as females to be in need of treatment for alcohol or drug use. Treatment need also decreases with age.

- American Indians report the highest levels of treatment need among the racial and ethnic groups included in the study. Controlling for other characteristics attenuates this relationship, however, suggesting that the association may be due to other factors such as educational and socio-economic disadvantage. Controlling for other characteristics, Asian Americans are less likely than whites to need treatment for a substance use problem.

- For the most part, the relationships between age, gender, and substance abuse treatment need were unaffected by the controls imposed by the multivariate analyses.

Mental Health

- Approximately 8% of Minnesota adults report significant depressive symptoms in the two weeks prior to their telephone interview and just over 2% report symptoms suggestive of a serious mental illness (SMI) in the month prior to the interview.

- The above numbers translate to about 317,500 and 94,800 Minnesota adults with serious depressive symptoms or SMI in 2005, respectively.

- African Americans experience the highest rates of depressive symptoms (19%) and Asians the lowest (5%). Older adults are much less likely to have experienced symptoms of serious mental illness than younger adults.

- Only 21% of those reporting depressive symptoms or symptoms suggestive of SMI reported having received mental health treatment in the past year. Here, females are more likely to have received treatment than males and younger adults are more likely to receive treatment than older adults.

Substance Abuse and Psychiatric Co-Morbidity

- Compared to those who do not, persons who report elevated depressive symptoms are significantly more likely to have a substance abuse disorder (alcohol and/or drug).

- A similar, but more striking, pattern was observed for those reporting symptoms suggestive of a serious mental illness (SMI). Such individuals are more than twice as likely to have an alcohol problem, more than 10 times more likely to have a drug disorder, and more than three times more likely to have a substance use disorder compared to their counterparts without SMI.

Substance Use and Body Mass Index

- Body Mass Index (BMI) was used as a measure of overweight/obesity in the survey.

- Using definitions developed by the World Health Organization (WHO), over half (58%) of Minnesota's adult population is overweight or obese.

- Overweight or obesity rates were highest among men, older persons, American Indians, non-immigrants, and residents living in a region of Minnesota outside of the Metro.

- Persons who are in the normal weight range than are more likely to have a drug-related disorder than are persons who are overweight/obese.

Conclusions

Use and abuse of, dependence on, and treatment need for alcohol still outpaces similar measures of illegal drug use in Minnesota. A significant number of residents continue to be in need of treatment services for either or both. The finding that many of these same people have not received treatment for their substance abuse is also of concern. Further, it is likely that the findings relating to the prevalence of depressive symptoms and serious mental illness as well as psychiatric and substance abuse co-morbidity will pose challenges to policy makers and treatment planners in the near future. It is hoped that this report will serve as an important source of information to these latter groups as they endeavor to design and target prevention and treatment programs.

**ESTIMATING THE NEED FOR TREATMENT FOR
SUBSTANCE ABUSE AMONG ADULTS IN MINNESOTA**

I. INTRODUCTION AND OVERVIEW

Drug and alcohol abuse and dependence exact a tremendous burden on individuals and

society. At the individual level, alcohol or drug disorders are associated with impaired personal

relationships, difficulties with work and school performance, and mental and physical health

problems. Severe consequences include children being removed from the care of their parents,

loss of employment and assets, arrests and incarceration, and chronic illnesses such as

HIV/AIDS, hepatitis C, and cirrhosis of the liver. (Burke, et al, 2005; Dillon, 2004; Galea &

Vlahov, 2003; Hampton et al, 1998; Lally et al, 2005; Midanik et al, 2004; MMWR, 1993;

Montoya et al, 2003)

At the societal level, addictions cost the health care system in the United States more than

$114 billion annually (Institute for Health Policy, 2001). In 2000, approximately 3.5% of deaths

(85,000 deaths) in the US could be attributed to alcohol consumption (the third leading cause of

death) and under 1% to illicit drug use (17,000 deaths) (Mokdad et al. 2004).   State and county

governments are responsible for the costs of social services resulting from the impact of

addictions on children and families. Addictions also raise the costs of health care, law

enforcement, the judicial system, and corrections (National Center on Addiction and Substance

Abuse, 2001). Unfortunately, most public expenditures related to alcohol and other drugs are

directed at the existing burden; of every public dollar spent related to alcohol and drugs, only 3.7

cents goes to fund prevention, treatment and research programs to reduce addiction and its

consequences (National Center on Addiction and Substance Abuse, 2001).

Extensive research, mostly federally-funded, suggests that treatment may result in large decreases in substance use, associated health care costs, and criminal activity, while increasing employment and economic self-sufficiency (Gerstein et al, 1994, Gerstein et al, 1997; Hubbard et al, 1997; Koenig et al, 1999; Miller and Hoffmann, 1995*)*. Treatment for addictions has proved to be as effective as treatment for other chronic conditions, such as diabetes, hypertension, and asthma (Marwick, 1998*)*. Treatment has been shown to decrease illicit drug use by 40 to 60 percent, as well as to dramatically reduce medical visits (Gerstein et al, 1997). Following treatment, mental health disorders decline by 35 percent, and inpatient mental health visits decrease by 28 percent (Gerstein et al, 1997).

A treatment outcome study in Minnesota also documented the success of treatment (Harrison and Asche, 1999; 2000; 2001). More than 60 percent of adults followed for six months after treatment reported total abstinence from alcohol and other drugs. Improvements were also seen with respect to employment, psychological well-being, and medical and family disorders. Minnesota's treatment outcomes matched or exceeded those reported in other major state- or federally-funded treatment outcomes studies (e.g., Gerstein et al, 1994; Hubbard et al, 1984; Hubbard et al, 1997; Simpson et al, 1999). Treatment has also been shown to be cost-effective (National Institute on Drug Abuse, 1999). Clearly, there are substantial benefits associated with getting those in need of substance abuse treatment adequately placed into the treatment system.

Treatment for alcohol and other drug abuse and dependence has been widely available and reasonably accessible in the State of Minnesota since the early 1970s. In addition to encouraging and sustaining a large private treatment industry, the State has mandated insurance coverage for substance abuse treatment since 1973. The State has also allocated substantial public funding for treatment, particularly since the establishment of the Consolidated Chemical Dependency Treatment Fund (CCDTF) in 1988, which standardized financial eligibility, as well

as assessment and placement criteria for public-pay clients. Minnesota has also directed significant funding to prevention efforts over the past 20 years. As the single authority responsible for defining a statewide response to drug and alcohol abuse, the Minnesota Department of Human Services requires estimates of the need for substance abuse treatment to facilitate precise targeting of available resources and improved program design.[1]

The primary objective of the survey was to obtain current estimates of the number of adults in the general population in Minnesota who are abusing or dependent on alcohol or other drugs and are in need of treatment. A secondary objective was to collect the information necessary to allow for detailed analyses about specific subpopulations as defined by gender, age group, race/ethnicity, immigration status (US-born versus foreign-born), and region of residence.

II. METHODOLOGY

The following is a brief summary of the methodology employed in the conduct of the 2004/2005 Minnesota Treatment Needs Assessment Survey. Additional details on the study design, study measures, and response rates are provided in Appendix I.

The project was designed to provide estimates of need for substance use treatment for a representative sample of non-institutionalized adults living in Minnesota as

Figure 1. Regions of Minnesota

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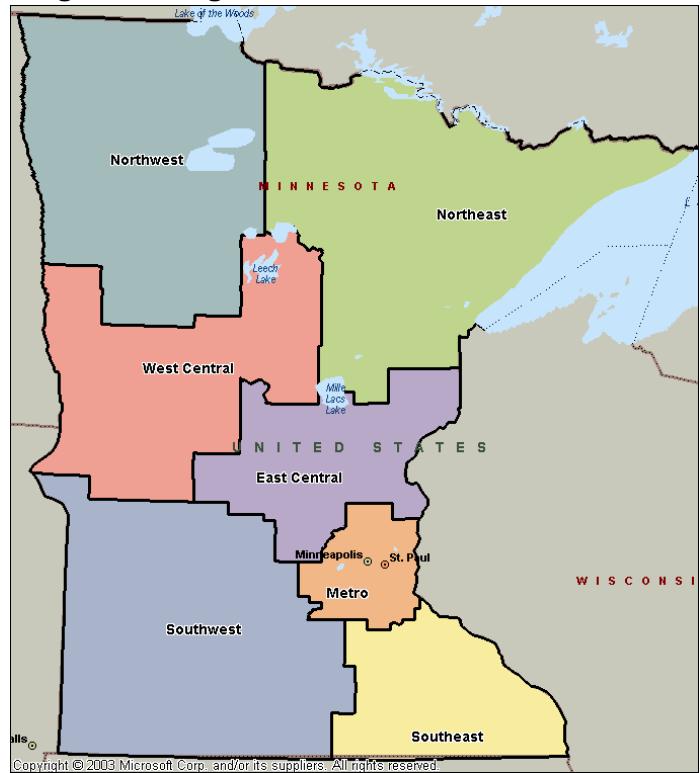
[1] Estimates of treatment need among adolescents are obtained from the triennial Minnesota Student Survey

well as estimates for 7 geographic regions (see Figure 1). In addition, the Minnesota

Department of Human Services (DHS) was interested in estimating need for treatment for

specific populations defined by gender, age, race and ethnicity and immigration status[2] (foreign-

born versus US-born). A stratified random sample design was employed (groups oversampled

in each strata are shown in Table 1).

A total of 16,891 telephone interviews were completed between October 2004 and July

2005. Interviews were conducted in English (N=16,340; 96.7%) and Spanish (N=551; 3.3%) by

the Health Services Research & Policy Survey Center at the University of Minnesota. Computer

Assisted Telephone Interviewing (CATI) facilitated the random selection of households through

random digit dialing. Only one adult in each household was randomly selected to participate in

the survey.

Using standard
response rate calculation
formulas (AAPOR, 2004), the
overall weighted response rate
was 55%, the cooperation rate
was 67%, and the refusal rate
was 31%. The response rate
is the ratio of completed
interviews to all eligible
numbers dialed. The

Table 1. Completed Interviews and Response Rates by Strata		
Strata	**Completed Interviews**	**Response Rate (RR4)**
Northeast	1093	60%
East Central	1090	57%
Minneapolis	1497	57%
St Paul	1288	51%
Suburban Metro	2965	59%
Southeast	832	60%
Southwest	1052	60%
West Central	1070	59%
Northwest	997	58%
Olmsted County	598	53%
African American	1452	49%
American Indian	977	58%
Hispanic surname	929	67%
Hmong surname	479	37%
Asian (non-Hmong) surname	572	52%

cooperation rate is the ratio of completed interviews to all eligible *respondents* contacted. As

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[2] Immigrant is a legal term defined by the Immigration and Naturalization Service of the US. In this report, we use the term to distinguish between US-born and foreign-born residents; it is not meant to delineate legal status.

shown on Table 1, the lowest response rate was for the Hmong strata (37%); this low response

rate is probably due to the large number of selected respondents who did not speak either English

or Spanish.

The survey instrument used for this investigation was based on the 2002 State Treatment

Needs Assessment Program (STNAP) survey core protocol questionnaire designed by the Center

for Substance Abuse Treatment (CSAT). The core survey was designed to yield rates of

substance use, abuse, dependence, and treatment need. DHS requested the addition of measures

of mental health and body mass index (BMI). The survey is available upon request. The

Institutional Review Boards for the Protection of Human Subjects at the University of Minnesota

and at DHS reviewed and approved the study.

Prior to analysis, the data were weighted to correct for the fact that individuals had

unequal probabilities of being selected into the sample due to the stratified sampling design and

the different number of adults and telephones within households. The data were also weighted so

that the final sample reflected the actual gender, age, geographic and racial/ethnic distribution of

adults in the state. Unless otherwise noted, the results presented in this report are weighted

estimates.

The initial descriptive analyses examine differences by region and by a variety of

demographic characteristics. Chi-square tests are used to assess differences in estimates among

groups. Because of the number of statistical tests undertaken as part of this report and the

relatively large sample size, only results attaining a statistical significance level of $p < .001$ are

emphasized in the narrative summaries of these results. Standard errors (SE) for all the weighted

estimates are also provided in the tables.[3] These estimates can be used to calculate confidence

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[3]Stata software was used to compute standard errors to adjust for complex sampling design using Taylor Series
Linearization.

intervals around estimates. Where appropriate, estimates are provided by gender, age, race/ethnicity, immigration status, and region. Estimates are not presented when the relative standard error[4] exceeds 30 percent. A more sophisticated set of analyses is then conducted that examines some of these characteristics simultaneously to determine if a difference associated with one characteristic (for example, living in a particular area) still holds up when factors such as race/ethnicity and age are taken into account.

While the factors addressed in this report are important for understanding how to allocate treatment resources and target specific high-risk populations, they do not explain disparities in substance use patterns or prevalence of substance use disorders. Understanding why some groups are observed to have higher rates of substance use and dependence than other groups is complicated. Differences may result from living in poverty and other stressful life circumstances, inequitable access to educational and employment opportunities, the availability of different drugs, the norms around substance use in the community, and attachment to families and community institutions. While we recognize the complexity of these issues, explaining differences in substance use is beyond the scope of this report. Thus, the reader should be cautious in making attributions about the causes of such problems as substance abuse or need for treatment based on the results of this project.

III. RESULTS

Sample Characteristics

Table 2 describes the sample and the population included in this study. The unweighted frequencies and percents (which describe the sample) are presented, as well as weighted percents (which describe the population and are the focus of the results presented).

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[4] The relative standard error is the standard error of the estimate divided by the estimate multiplied by 100 (expressed as a percentage).

As shown, the population is approximately equally split between females (51%) and males (49%). Roughly two-thirds of the Minnesota population is 25 to 64 years old, 16 percent are 65 years of age or older, and about the same amount are under 25 (14%). The population of Minnesota is predominately White (89%) with 3.3% African American, 2.9% Asian, 2.8%

		Frequency Unweighted	Percent Unweighted	Percent Weighted	Standard Error
Table 2. Characteristics of the Sample and the Minnesota Adult Population					
	TOTAL	**16891**	**100.0%**	**100.0%**	----
Gender					
	Male	6840	40.5	48.9	.56
	Female	10051	59.5	51.1	.56
Age (in years)					
	18-24	1287	7.7	13.7	.50
	25-44	6255	37.2	38.7	.54
	45-64	6234	37.1	31.9	.49
	65+	3036	18.1	15.7	.36
Race/Ethnicity					
	White	14050	83.9	89.3	.39
	Latino	940	5.6	2.8	.18
	African American	570	3.4	3.3	.20
	Asian	495	3.0	2.9	.29
	American Indian	316	1.9	.9	.11
	Multiple Race & Other	378	2.3	.8	.06
Foreign Born					
	No	15306	91.0	93.0	.33
	Yes	1516	9.0	7.1	.33
Region					
	Metro	8540	50.6	53.1	.31
	Northeast	1365	8.1	6.7	.14
	Northwest	1517	9.0	3.9	.08
	East Central	1302	7.7	10.4	.20
	West Central	1298	7.7	6.3	.12
	Southeast	1578	9.3	9.4	.16
	Southwest	1291	7.6	10.3	.18

Latino, .8% multiple race or other race[5] and just under 1% American Indian. A substantial

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[5] Ten respondents self-identified as a race other than those in the listed categories

minority (7%) of the Minnesota population were not born in the United States, a rate somewhat

higher than the 5.3% estimated for Minnesota by the Census Bureau. Finally, just over one-half

of the population resides in the Minneapolis-St. Paul metropolitan area (Metro Region) area

while the balance live in Greater Minnesota.

Cigarette Use

Respondents who indicated that they smoked at least 100 cigarettes in their lifetime were

categorized as meeting the criteria for lifetime cigarette use. Those who indicated that they now

smoked every day or smoked at least one cigarette in the past 30 days were categorized as smoking in the past month.

As shown on Table 3, approximately 47% of adults in Minnesota have smoked cigarettes at some point in their lives, with 23% reporting that they smoked in the past month. Use of cigarettes varies significantly by demographic characteristics. Men are much more likely to be lifetime smokers than are women (52% vs. 43%). However, the gender gap is much narrower for current (past month) smoking behavior (24% vs. 21%).

As expected, age is positively associated with lifetime use, but negatively associated with recent use of cigarettes. That is, while older

Table 3. Cigarette Use by Demographic Characteristics	Lifetime Use		Past Month Use	
	%	SE	%	SE
Total	**47.3**	**.55**	**22.7**	**.49**
Gender		***		**
Male	51.8	.86	24.2	.76
Female	42.9	.70	21.3	.62
Age (in years)		***		***
18-24	43.5	2.04	40.3	2.03
25-44	42.2	.87	25.1	.77
45-64	53.3	.88	20.0	.69
65+	50.8	1.21	6.9	.56
Race/Ethnicity		***		***
White	48.4	.58	22.2	.51
Latino	30.5	3.02	23.5	3.04
African American	38.1	3.01	27.1	2.86
Asian	26.4	4.71	18.2	4.34
American Indian	77.9	4.74	54.2	5.87
Multiple Race/Other	60.9	4.16	44.8	4.07
Foreign Born		***		***
No	48.8	.57	23.2	.51
Yes	27.4	2.07	16.4	1.71
Region		***		
Metro	46.3	.83	22.0	.73
Northeast	56.0	1.75	26.5	1.55
Northwest	48.4	1.68	25.5	1.51
East Central	48.9	1.74	24.2	1.52
West Central	48.6	1.72	22.1	1.47
Southeast	46.7	1.58	22.5	1.45
Southwest	44.1	1.69	22.1	1.47

* p<.05; ** p<.01;*** p<.001

persons are more likely than young persons to have ever smoked cigarettes, younger persons are more likely to be current smokers. Indeed, 40% of persons ages 18 to 24 smoked in the past month, compared to only 7% of persons 65 years and older.

As shown on Figure 2, for each age group, women are less likely to report smoking in the past month than are men. However, the gender differences do not reach statistical significance in any of the age groups.

Figure 2. Past Month Smoking by Gender and Age

	Men	Women
18-24	42.5%	38.0%
25-44	26.2%	24.0%
45-64	21.2%	18.9%
65+	7.5%	6.5%

% of adult population vs *Age Group*
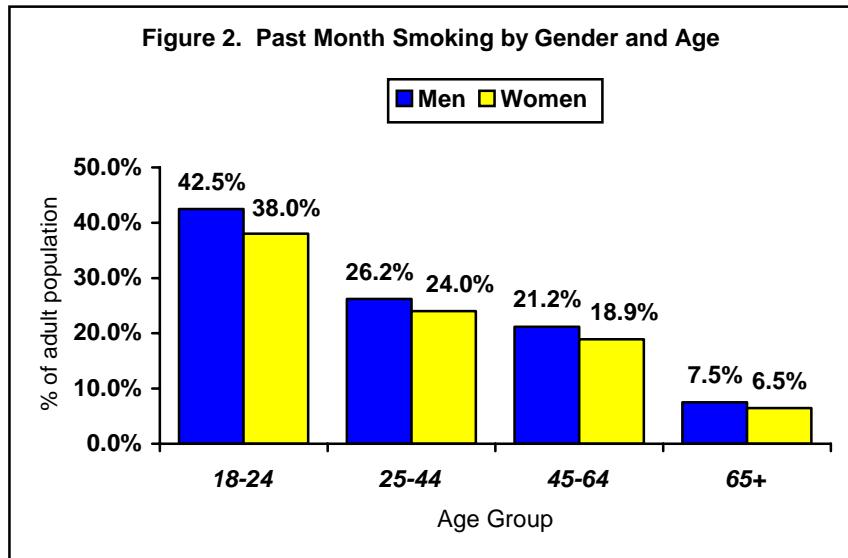
Comparing estimates by race and ethnicity (Table 3), both lifetime and past month cigarette smoking are highest among American Indian adults and lowest among Asian adults. The current prevalence of smoking among American Indian respondents is more than twice as high as any other ethnic/racial groups, with the exception of the multiple and other race group. Adults not born in the US are also significantly less likely to have smoked cigarettes ever or recently compared to their counterparts who were born in the US.

There is a significant regional difference in lifetime cigarette smoking, with persons in the Northeast most likely to report having smoked. There are no significant regional differences in past month cigarette smoking.

Alcohol Use

Respondents who indicated that they had ever had 12 or more drinks in a single year were categorized as meeting the criteria for lifetime use of alcohol. Persons who said that they had a drink in the past twelve months were categorized as having used alcohol in the past year, while those who said they last drank in the past 30 days were categorized as having used alcohol in the past month.

Detailed prevalence estimates of lifetime, past year, and past month use of alcohol among Minnesotans are presented in Table 4. Overall, approximately 81% of respondents indicated that they had used alcohol in their lifetimes, 71% used alcohol in the past year and 60% had at least one drink in the past month. For each time period, alcohol use is more common among men than among women. For example, two-thirds of men reported drinking in the past month compared to just over one-half of women.

The lowest rates of drinking are observed in the youngest (age 18 to 24 years) and oldest age groups (age 65 or over). Further analyses (not tabled) focused on the prevalence of alcohol use among young adults who are not of legal age. It is noteworthy that many of these young adults acknowledge having consumed alcohol in their lifetimes (58%), in the past year (52%), or in the past month (39%). Applied to the 2005 statewide population, this latter percentage translates to 88,100 underage adults who drank alcohol in the past month.[6]

Across all time periods, persons who self-identify as White, American Indian, or Multiple Race/Other are most likely to report drinking; African Americans, Asians, and Latinos are the least likely to report drinking. It is noteworthy that the past month use of alcohol for Whites is almost twice that of Latino, African American or Asian adults in Minnesota.

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[6] All population estimates for 2005 are based on Census projections of the population on July 1, 2005; US Census Bureau, http://www.census.gov/population/www/projections/popproj.html; assessed October 20, 2005

Table 4. Alcohol Use by Demographic Characteristics

	LIFETIME USE		PAST YEAR USE		PAST-MONTH USE	
	%	SE	%	SE	%	SE
Total	**81.0**	**.44**	**71.0**	**. 50**	**59.8**	**. 54**
Gender		***		***		***
Male	87.9	.60	76.8	.73	66.9	.81
Female	74.3	.64	65.4	.68	53.0	.71
Age (in years)		***		***		***
18-24	70.2	1.89	65.7	1.95	54.6	2.04
25-44	86.8	.60	79.3	.72	66.4	.82
45-64	85.4	.62	73.2	.77	62.8	.84
65+	67.4	1.11	51.1	1.21	42.3	1.20
Race/Ethnicity		***		***		***
White	84.5	.41	74.2	.49	62.8	.55
Latino	48.2	3.26	40.4	3.13	32.7	2.92
African American	51.1	3.15	42.3	3.08	33.4	2.93
Asian	42.2	5.00	41.3	5.00	34.3	4.95
American Indian	81.4	4.23	61.8	5.51	48.8	5.92
Multiple Race/Other	77.1	3.37	63.0	4.06	46.8	4.09
Foreign Born		***		***		***
No	83.4	.42	73.0	.49	61.7	.55
Yes	48.6	2.44	44.3	2.40	34.2	2.24
Region						**
Metro	80.5	.68	71.7	.75	61.5	.81
Northeast	82.7	1.35	69.5	1.60	57.2	1.71
Northwest	80.3	1.30	68.6	1.51	54.7	1.66
East Central	83.6	1.26	73.5	1.49	60.7	1.68
West Central	81.6	1.27	69.6	1.56	57.0	1.70
Southeast	80.4	1.29	68.8	1.48	56.7	1.57
Southwest	80.3	1.34	69.5	1.55	58.3	1.67

* p<.05; ** p<.01;*** p<.001

Persons who were not born in the US are significantly less likely to report using alcohol than persons born in the US. For example, while just over one-third of foreign-born adults drank alcohol in the past month, almost two-thirds of adults born in the US did so.

Table 5 examines differences in binge drinking or heavy drinking, both of which are associated with higher risk of adverse consequences. Binge drinking in the past year is defined as consuming, on a single occasion, 4 or more drinks for women, and 5 or more drinks for men. Heavy drinking is defined as binge drinking on at least 5 occasions in the past 30 days. As defined in this report, heavy drinkers are a subset of binge drinkers; they engage in the same high-quantity consumption, but more frequently.

As shown, just under one-fifth (19%) of the adult population reported binge drinking in the past month and just over one-third (35%) acknowledged binge drinking in the past year. Binge drinking is more common among men and younger persons than among older persons and women. American Indians, Whites and those who report multiple or other races have higher rates of binge drinking than the other racial and ethnic groups. Persons born in the US are about twice as likely to have engaged in binge drinking than persons not born in the US.

Figure 3 shows the prevalence of past month binge drinking by age and gender. As shown, for every age group men are significantly more likely to report binge drinking in the past

Figure 3. Past Month Binge Drinking by Gender and Age
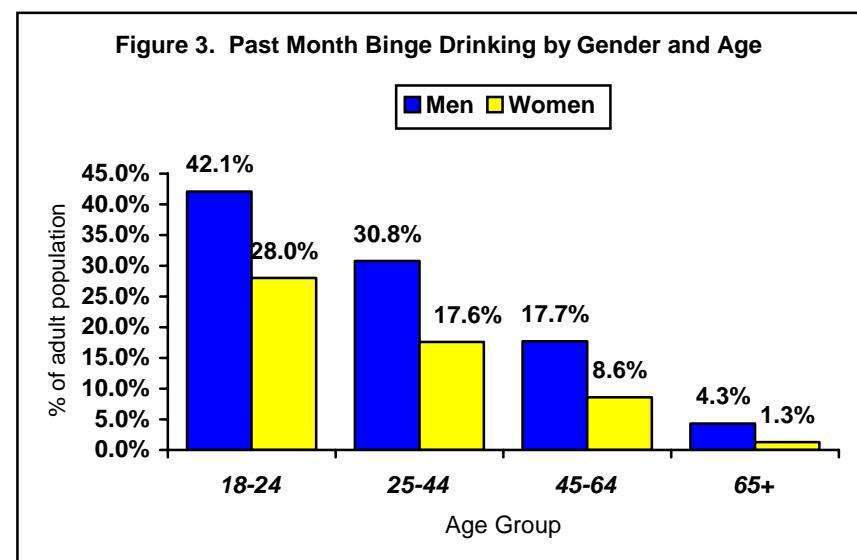
Table 5. Binge Drinking and Heavy Drinking by Demographic Characteristics

	Past Year Binge Drinking		Past Month Binge Drinking		Past Month Heavy Drinking	
	%	SE	%	SE	%	SE
Total	**35.0**	**.55**	**18.8**	**.47**	**4.4**	**.26**
Gender		***		***		***
Male	41.9	.86	24.3	.77	6.2	.42
Female	28.4	.67	13.5	.53	2.8	.30
Age (in years)		***		***		***
18-24	55.5	2.03	35.2	2.00	11.2	1.38
25-44	45.7	.88	24.0	.76	4.4	.36
45-64	27.3	.79	13.3	.58	3.2	.29
65+	6.3	.59	2.7	.37	1.0	.22
Race/Ethnicity		***		**		
White	36.1	.57	19.3	.49	4.6	.28
Latino	25.4	2.72	15.1	2.31	----	----
African American	19.3	2.57	9.5	2.07	----	----
Asian	24.0	4.90	----	----	----	----
American Indian	49.3	5.92	30.5	6.07	----	----
Multiple Race/Other	38.5	4.07	18.8	3.44	----	----
Foreign Born		***		***		*
No	36.2	.57	19.5	.49	4.5	.27
Yes	18.3	1.88	8.1	1.21	2.6	.74
Region		**				
Metro	33.8	.81	18.2	.70	4.3	.38
Northeast	37.8	1.75	19.3	1.49	5.2	.83
Northwest	38.6	1.69	22.3	1.54	4.5	.79
East Central	39.9	1.75	20.6	1.50	5.6	1.00
West Central	34.1	1.67	18.6	1.40	4.8	.75
Southeast	33.4	1.54	16.9	1.23	3.7	.65
Southwest	35.1	1.69	20.1	1.48	3.7	.71

----estimate not considered reliable

* p<.05; ** p<.01;*** p<.001

thirty days than are women. However, the estimates for 65 years and older are imprecise due to small sample sizes and therefore should not be considered reliable.

Heavy drinking, like binge drinking, is more common among men than women and among persons aged 18-24 than older adults. Persons born in the US are about 1.7 times as likely to report heavy drinking than persons who were not born in the US (p<.05).

Illegal Drug Use

Respondents were asked if they had ever used 10 specific types of illegal drugs: marijuana or hash, powder cocaine, crack cocaine, heroin, methamphetamine, other stimulants or "uppers", hallucinogens, club drugs, opium or khat. Club drugs are those whose popularity first emerged in nightclubs and include drugs such as ecstasy and GHB. Khat is a stimulant that comes from a shrub common in East Africa. Additional questions asked about recency and frequency of use and whether respondents ever thought that they had a problem with use of the drug.   We use the term 'illegal' to refer to this class of drugs in order to distinguish them from the misuse of prescription drugs, which is discussed later in the report.

Lifetime use of these drugs is shown in Figure 4, and past year use is shown in Figure 5. Sample sizes are too small to present separate estimates for the use of khat. However, khat is included in estimates of use of any drug and for estimates of rates of abuse/dependence.

Figure 4. Lifetime Use of Illegal Drugs

Drug	% of adult population
Heroin	0.8%
Crack Cocaine	2.1%
Club Drugs	2.5%
Opium	2.9%
Methamphetamine	3.5%
Other Stimulants	8.1%
Hallucinogens	10.4%
Powder Cocaine	10.4%
Marijuana	39.6%
Any Illegal Drug	40.5%
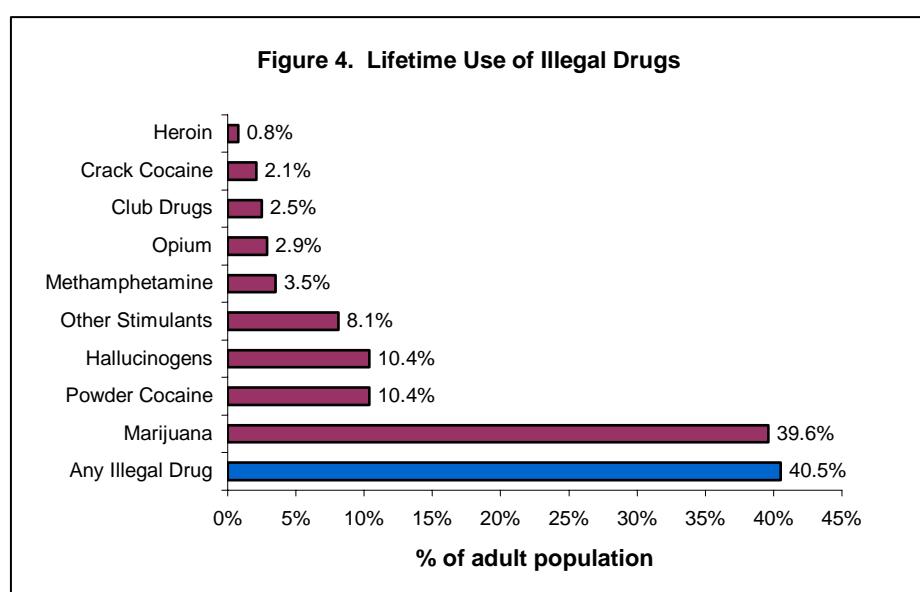
The most commonly used drug is marijuana, with almost 40% of the population reporting that they used this drug at some time in their lives. Powder cocaine and hallucinogens were used by about 10% of the population, while just above 8% have used stimulants other than cocaine or methamphetamine. Between 2 to 4 percent of respondents indicated they had used opium, club drugs or crack cocaine in their lifetime. The prevalence of lifetime use of methamphetamines is 3.5%, representing about 144,300 adults in Minnesota.

Past year use of illegal drugs (Figure 5) is much less common than lifetime use, meaning that there are many more former than current drug users among the adult population. Approximately 7% of the adult population of Minnesota reported use of

Figure 5. Past Year Use of Illegal Drugs

Drug	% of adult population
Heroin	0.1%
Opium	0.2%
Other Stimulants	0.3%
Crack Cocaine	0.4%
Methamphetamine	0.6%
Club Drugs	0.6%
Hallucinogens	0.7%
Powder Cocaine	0.9%
Marijuana	6.7%
Any Illegal Drug	7.2%
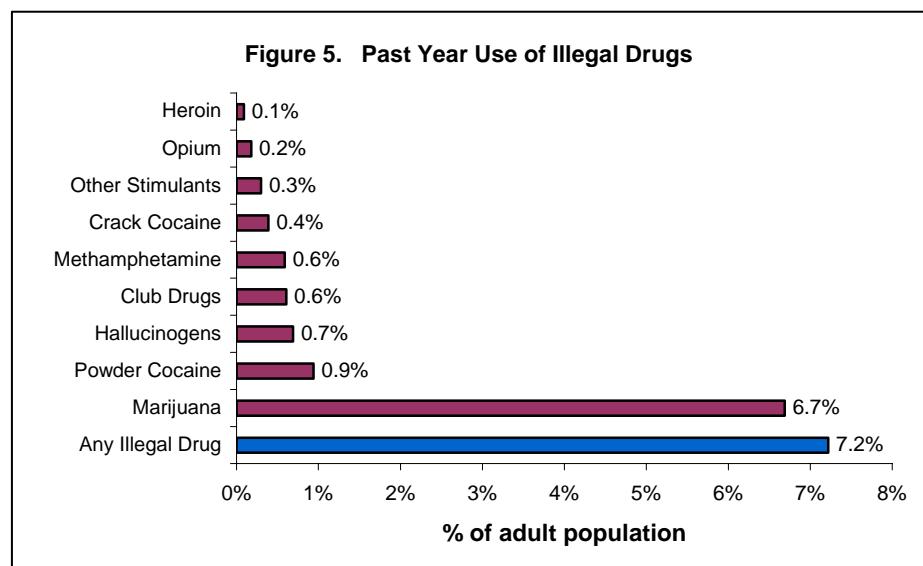
marijuana in the past year and 1% or less reported use of any other specified illegal drug. These estimates suggest that approximately 24,700 adults used methamphetamines in the past year; this is a conservative estimate given many respondents may have not disclosed such use. Note, the estimates of heroin and opium use are imprecise due to small sample sizes and should not be considered reliable.

Table 6 examines the demographic correlates of lifetime and past year use of marijuana, the most common illegal drug used. As shown, men are more likely than women to report marijuana use either recently (9.0% vs. 4.5% in past year) or at some time in the past (45%

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versus 34% for lifetime). Use of marijuana in both periods is negatively correlated with age; older persons are less likely to report using this drug.

Among the racial and ethnic groups, self-reported lifetime use of marijuana is highest among American Indian adults (66%) and lowest for Asian adults (20%). The use of marijuana is much less common in the past year for all groups; however, the prevalence remains highest in the American Indian population.

Self-reported use of marijuana is much lower among foreign-born adults in Minnesota than it is among persons born in the US. It is striking that lifetime use among foreign born residents is less than one-half that of US born adults.

Persons in the Metro region report the highest rates of use. The lowest rate is observed for the Southwest region.

We next examined demographic characteristics of persons who used any illegal drug. (Table 7). The sample sizes for specific drug categories other than marijuana are too small for analyses by demographic characteristics. Therefore, estimates of illegal drug use are presented with and without marijuana use included.

Table 6. Marijuana Use by Demographic Characteristics

	Lifetime Use		Past Year Use	
	%	SE	%	SE
Total	**39.6**	**.55**	**6.7**	**.32**
Gender		***		***
Male	45.3	.86	9.0	.53
Female	34.1	.68	4.5	.37
Age (in years)		***		***
18-24	49.2	2.05	22.4	1.76
25-44	48.0	.88	6.2	.42
45-64	43.5	.87	3.8	.32
65+	2.4	.32	----	----
Race/Ethnicity		***		***
White	40.3	.57	6.4	.34
Latino	23.6	2.86	----	----
African American	39.2	3.03	9.6	1.96
Asian	20.3	4.54	----	----
American Indian	65.5	5.23	21.0	4.94
Multiple Race & Other	55.0	4.13	17.4	3.51
Foreign Born		***		*
No	41.2	.56	6.9	.34
Yes	18.2	1.82	3.6	1.07
Region		***		***
Metro	43.8	.82	8.2	.51
Northeast	38.0	1.70	6.3	.97
Northwest	32.4	1.63	7.3	1.11
East Central	40.3	1.74	5.7	1.11
West Central	32.5	1.64	4.5	.81
Southeast	35.2	1.56	5.5	.81
Southwest	29.0	1.60	2.4	.58

*p<.05; ** p<.01;*** p<.001
----estimate not considered reliable

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The lifetime and past-year prevalence of any illegal drug use are presented in the first two columns. For the most part, these analyses parallel those found for marijuana use. This is not surprising given that marijuana use comprises the majority of all drug use. Indeed, of the group who self-reported using any illegal drug, 93% reported using marijuana (data not tabled).

Looking at the demographic correlates of illegal drug use, men were more likely than women to indicate use of illegal drugs. Almost twice as many men (9.6%) as women (4.9%) indicated that they had used an illegal drug in the past year.

Age was significantly associated with use of any illegal drug, but the age distribution of use varied depending on time frame. Lifetime use of drugs was generally similar for persons 18 through 64 (varying from about 50% to 44% of the population in these age group), but was substantially lower (4%) for persons 65 years of age and older. In contrast, past year use was substantially higher for persons 18-24 years of age compared to the other age groups.

As shown on Figure 6, for every age group except those 65 years and older, men were more likely than women to report the use of illegal drugs in the past year. Note that the sample sizes for the oldest age group are too small to present reliable estimates by gender.

Figure 6. Past Year Illegal Drug Use by Gender and Age
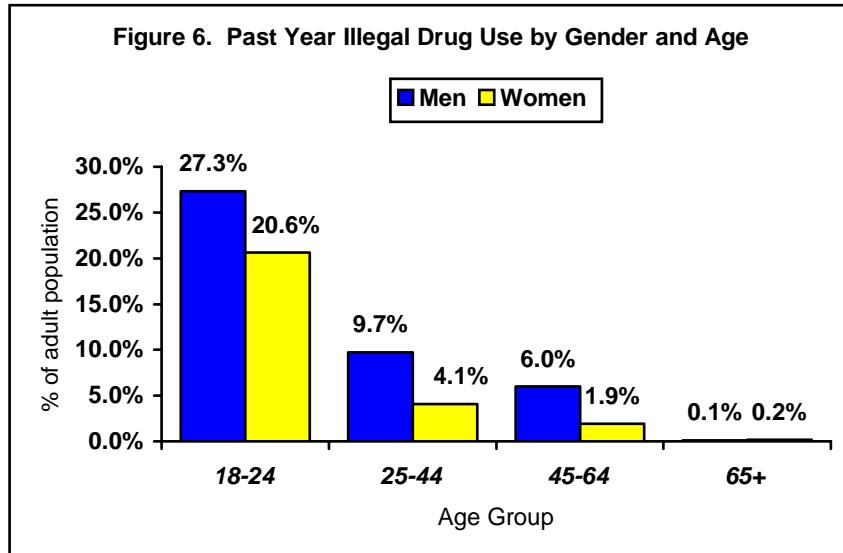
Table 7. Lifetime and Past Year Use of Illegal Drugs by Demographic Characteristics

| | ILLEGAL DRUGS INCLUDING MARIJUANA | | | | ILLEGAL DRUGS EXCLUDING MARIJUANA | | | |
| | Lifetime Use | | Past Year Use | | Lifetime Use | | Past Year Use | |
	%	SE	%	SE	%	SE	%	SE
Total	**40.5**	**.55**	**7.2**	**.34**	**17.3**	**.44**	**2.1**	**.21**
Gender		***		***		***		**
Male	46.2	.86	9.6	.56	20.7	.71	2.7	.32
Female	35.0	.69	4.9	.39	14.1	.53	1.6	.27
Age (in years)		***		***		***		***
18-24	49.8	2.05	24.0	1.80	21.0	1.79	9.1	1.28
25-44	48.9	.88	6.8	.45	21.6	.73	1.7	.24
45-64	44.4	.88	4.0	.33	18.1	.68	.5	.10
65+	3.7	.45	----	----	1.8	.35	----	----
Race/Ethnicity		***		***		***		
White	41.2	.57	6.9	.35	17.7	.46	2.1	.22
Latino	26.1	2.94	6.8	2.03	12.9	2.33	----	----
African American	40.4	3.04	10.5	1.99	11.2	1.81	----	----
Asian	20.4	4.54	----	----	----	----	----	----
American Indian	65.9	5.22	21.8	4.96	31.0	6.27	----	----
Multiple Race & Other	57.1	4.11	18.3	3.54	30.3	3.78	----	----
Foreign Born		***		*		***		
No	42.1	.57	7.4	.35	18.1	.46	2.2	.22
Yes	19.4	1.85	4.2	1.12	6.9	.94	----	----
Region		***		***		***		
Metro	44.9	.83	8.9	.53	20.4	.69	2.6	.33
Northeast	39.0	1.70	7.4	1.06	16.4	1.30	1.8	.54
Northwest	32.9	1.63	7.5	1.12	12.7	1.15	----	----
East Central	40.9	1.74	5.9	1.12	15.4	1.30	----	----
West Central	33.1	1.65	4.8	.82	10.7	1.08	----	----
Southeast	35.8	1.56	5.6	.82	15.0	1.17	----	----
Southwest	29.8	1.60	2.9	.69	11.5	1.18	----	----

*p<.05; ** p<.01;*** p<.001
----estimate not considered reliable

Regardless of time frame, American Indians reported the highest rates of illegal drug use with 66% reporting lifetime use and 22% use in the past year (Table 7). The lifetime rate for American Indians is at least 1.5 times and the past year rate more than twice that of other single racial/ethnic group. Asians and Latinos reported the lowest rates of lifetime use. Persons born in the US were over twice as likely as foreign-born Minnesotans to report lifetime use of any illegal drugs with just under one-fifth of immigrants indicating use.

Both lifetime and past year use of any illegal drugs varied significantly by region; the lifetime and 12-month prevalence of use is highest in the Metro region. Lifetime use was lowest in the Southwest area.

The final two columns in Table 7 present the percentages for illegal drug use excluding marijuana. Men, younger persons, American Indians, non-immigrants and those residing in the metropolitan region are more likely to report lifetime use of illegal drugs other than marijuana. Significant differences for past year use are seen for men compared to women and for younger adults compared to older adults. Sample sizes are too small to assess reported differences in past year use by racial/ethnic category, immigrant status, or geographic region.

Non-medical Use of Prescription Drugs

To measure potential prescription drug abuse, respondents were asked if they ever used three types of prescription drugs (pain relievers, tranquilizers or sedatives) "on your own – that is, either outside prescribed use or that you took for the experience or the feeling they caused." Individuals who indicated that they had used the medication were asked further questions about recency and frequency of use and whether they ever thought they had a problem with their use of the medication.

Rates of lifetime and past year non-medical use of specific types of prescription drugs are shown in Figures 7 and 8.

Just over 6% of the population indicated that they have used pain relievers, 4% have used tranquilizers, and 4% have used sedatives for non-medical reasons at some point in their lives (Figure 7). Overall, approximately 9% of the population reported misusing prescription drugs at some point.

Figure 7. Lifetime Nonmedical Use of Prescription Drugs

Drug	% of adult population
Sedatives	3.6%
Tranquilizers	3.8%
Pain Relievers	6.2%
Any Prescription Drug	8.5%

Consistent with the results for lifetime prevalence, pain relievers were the most common prescription drug used for non-medical reasons (Figure 8), followed by tranquilizers and sedatives. Combining all medications, approximately 3% of the population misused prescription drugs in the past year, a rate about one-third the rate of reported lifetime use. Approximately 1% of persons who misused such drugs indicated that they sometimes obtained them using the Internet.
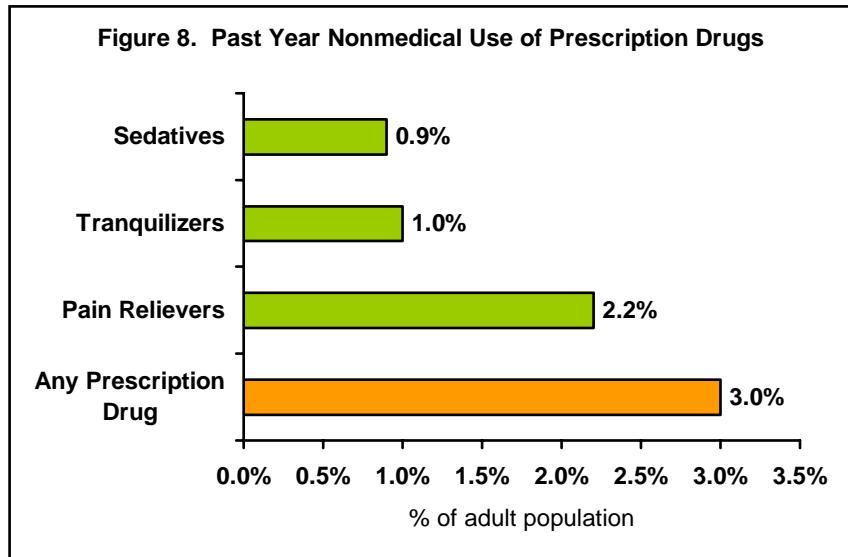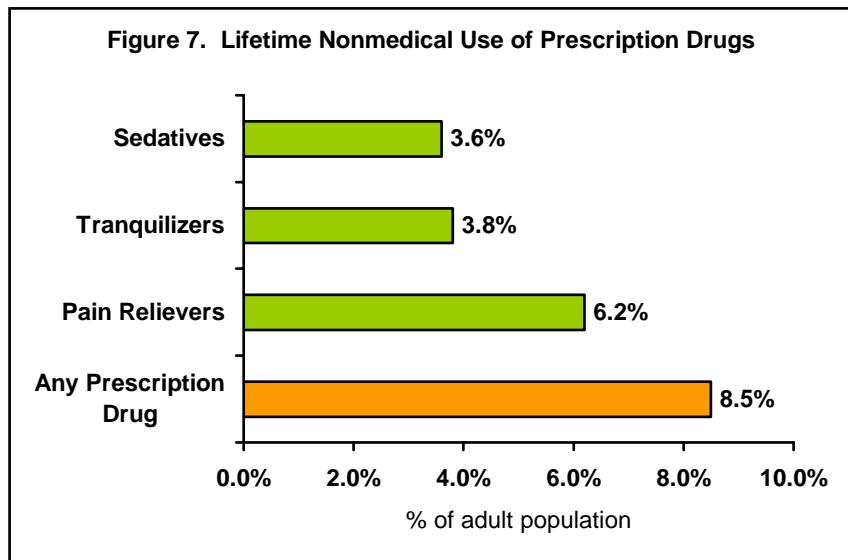
Figure 8. Past Year Nonmedical Use of Prescription Drugs

Drug	% of adult population
Sedatives	0.9%
Tranquilizers	1.0%
Pain Relievers	2.2%
Any Prescription Drug	3.0%

The demographic correlates of lifetime misuse of prescription drugs are presented in

Table 8. We focus on lifetime use only in this section due to the small available sample for past

year use. Detailed analyses of the use of specific types of drugs by demographic characteristic

show the same pattern of results as for any

prescription drug use. However, these analyses

are not presented because sample sizes for

specific subgroups are often too small to

provide reliable estimates.

Men are significantly more likely than

women to report non-medical use of

prescription drugs. Misuse of prescription

drugs decreases steadily with age: the highest

rates of medication abuse are among those

aged 18 to 24 years and the lowest are among

those 65 years or older.

Lifetime abuse of prescription drugs is

highest among American Indians (22%), with a

rate twice as high as any other single

racial/ethnic group. Among the racial/ethnic

Table 8. Lifetime Non-medical Use of Prescription Drugs by Demographic Characteristics		
	Lifetime Use	
	%	SE
Total	**8.5**	**.34**
Gender		***
Male	10.8	.56
Female	6.3	.39
Age (in years)		***
18-24	17.5	1.63
25-44	8.4	.49
45-64	7.7	.47
65+	2.3	.35
Race/Ethnicity		***
White	8.2	.36
Latino	11.1	2.44
African American	10.6	2.16
Asian	----	----
American Indian	21.9	4.87
Multiple Race & Other	20.2	3.74
Foreign Born		*
No	8.7	.36
Yes	6.1	1.06
Region		***
Metro	10.1	.54
Northeast	6.9	.94
Northwest	8.3	1.09
East Central	6.7	.94
West Central	5.5	.82
Southeast	7.6	.92
Southwest	5.7	.87

*p<.05; ** p<.01;*** p<.001
----estimate not considered reliable

groups for which we have a large enough sample to present reliable estimates, the lowest rate is

reported by the White population (8%). Note, however, that while the estimate for Asian

Americans (3%) is unreliable (and therefore not presented on the table), the results suggest that

lifetime misuse of prescription drugs is also very low for this group. Finally, persons in the

Metro region are more likely to report non-medical use of prescription drugs than are persons in

other regions of Minnesota. The prevalence of lifetime use is lowest in the West Central and Southwest regions.

Figure 9 shows the prevalence of having ever used prescription drugs for non-medical reasons by age and gender. For each age group (except the oldest), men are more likely to have used such drugs for non-medical reasons. The gender gap is largest among the youngest (18-24 years) age group.

Figure 9. Lifetime Nonmedical Use of Prescription Drugs by Gender and Age

Men ☐ Women

% of adult population

	18-24	25-44	45-64	65+
Men	20.7%	10.9%	9.8%	2.6%
Women	14.2%	6.0%	5.5%	2.2%

Age Group
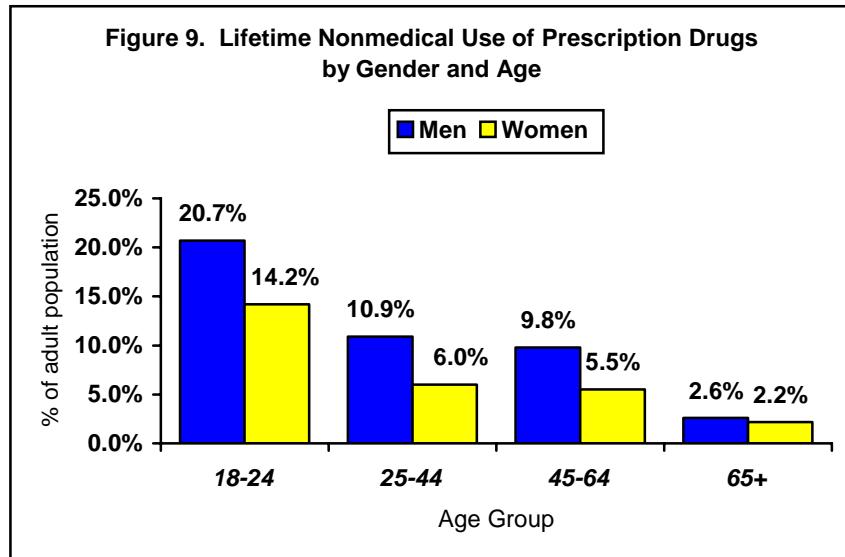
The estimates for those 65 years and older are not considered reliable because of small sample sizes.

Overall, approximately 42% of the adult population had used *either* illegal drugs or misused prescription drugs at least once and 8.8% acknowledged doing so it the past year. This translate to about 362,900 adults Minnesotans who used illicit (illegal or prescription) drugs in the past year.

Substance Abuse and Dependence

Substance Abuse or Dependence was defined consistent with criteria from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) (American Psychiatric Association, 2000). DSM-IV is a compilation of diagnostic criteria for various mental disorders. It distinguishes between substance dependence and abuse, with dependence being the more severe form of disorder. Further details about diagnostic criteria and scoring algorithms are

provided in Appendix I. Measures of alcohol and drug abuse and dependence were computed

separately. Substance abuse was defined as either alcohol or drug abuse. Substance dependence

was defined as either alcohol or drug dependence. An alcohol use disorder was defined as either

alcohol dependence or abuse, and a drug use disorder was defined as meeting the definition of

either drug abuse or dependence. Persons who meet the criteria for either a drug or an alcohol

related disorder were defined as meeting the criteria for either substance dependence or abuse.

Estimates of alcohol and drug dependence and abuse are shown in Figure 10.

Approximately 3.3% of the population met the criteria for alcohol dependence, with a further

4.8% meeting the criteria for alcohol abuse. This means that, in 2005, approximately 329,900

(8.0%) adults in Minnesota meet the criteria for an alcohol use disorder according to DSM-IV

criteria.

Disorders related to the use of drugs are less common than alcohol use disorders. Less than one percent (0.6%) of the population met the criteria for drug abuse, and an additional 1.7% met the criteria for drug dependence. Overall, 2.2% of the

Figure 10. Prevalence of Substance Use Disorders[1]

□ **Abuse** ☐ **Dependence** ■ **Either dependence or abuse**

Alcohol
- 8.0%
- 3.3%
- 4.8%

Drug
- 2.2%
- 1.7%
- 0.6%

Either Drug or Alcohol
- 9.1%
- 4.4%
- 5.1%

0.0%   2.0%   4.0%   6.0%   8.0%   10.0%

% of adult population

[1]Numbers for abuse and dependence do not sum to total (either dependence or abuse) because of rounding error and missing values. Note: dependence and abuse are not mutually exclusive for persons with **either** drug or alcohol use disorders.

population, or approximately 90,700 adults in Minnesota had a drug use disorder in the past year.

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Of persons with a substance use disorder, approximately 13% met the criteria for having both an alcohol and drug disorder. Approximately 75% had only an alcohol disorder, and 12% only a drug disorder.

Table 9 shows that the vast majority of persons with alcohol or drug use disorders do not receive specialty treatment. Specialty treatment is defined as any treatment or counseling for alcohol or drug disorders not including support groups such as Alcoholics Anonymous or Narcotics Anonymous. Persons who met the criteria for drug dependence are the most likely to have received specialty treatment in the past year. However, even among this group, less than one-quarter reported receiving treatment.

Rates of treatment are much higher for those with dependence disorders than for abuse disorders. Indeed, the number of persons with abuse disorders who receive treatment is so low as to make presentation of estimates unreliable. This is not surprising given that dependence on substances is a more serious form of disorder than is abuse. Overall, only 7% of persons with either abuse or dependence disorders received specialty treatment. Thus, less than 1% (.6%) of the adult Minnesota population has a substance use disorder and received treatment.

Estimates of past year substance abuse and dependence by gender, age, race/ethnicity, immigration status, and region are provided in Table 10. Males were consistently and

Table 9. Receipt of Treatment for Substance Use Disorders		
	% of Population with Disorder	
	%	SE
Alcohol		
Abuse	----	----
Dependence	11.0	2.21
Abuse or Dependence	4.5	.93
Drug		
Abuse	----	----
Dependence	22.3	4.20
Abuse or Dependence	16.5	3.15
Either Alcohol or Drug		
Abuse	----	----
Dependence	13.8	2.13
Abuse or Dependence	6.8	1.07

p<.05; ** p<.01;*** p<.001
----estimate not considered reliable

significantly more likely than females to report symptoms that constituted alcohol and/or drug use disorders. The likelihood of a substance use disorder decreases with age.

There are no significant race/ethnic differences in the prevalence of alcohol disorders and while many of the estimates for drug disorders are unreliable, they suggest that American Indians experience the highest rates of drug-related disorders. While the results for the prevalence of either drug or alcohol disorders were only modestly significant, they do suggest that adults who identify as American Indians and those of multiple or other races are much more likely to experience these disorders than are the remaining racial/ethnic groups.

Table 10. Past Year Substance Abuse/Dependence by Demographic Characteristics						
	Alcohol Disorder		Drug Disorder		Alcohol or Drug Disorder	
	%	SE	%	SE	%	SE
Total	**8.0**	**.34**	**2.2**	**.21**	**9.1**	**.36**
Gender		***		***		***
Male	11.7	.57	3.0	.36	13.2	.62
Female	4.5	.35	1.5	.22	5.2	.38
Age (in years)		***		***		***
18-24	16.4	1.60	9.7	1.29	20.6	1.75
25-44	9.0	.51	1.8	.22	10.1	.54
45-64	6.6	.45	.7	.13	6.9	.45
65+	1.3	.29	0.0	.00	1.3	.29
Race/Ethnicity				***		*
White	8.4	.36	2.1	.22	9.4	.39
Latino	4.7	1.24	----	----	5.9	1.44
African American	----	----	2.8	.76	6.6	1.77
Asian	----	----	----	----	----	----
American Indian	7.9	2.29	15.0	4.57	18.8	4.66
Multiple Race & Other	12.9	2.98	----	----	16.8	3.37
Foreign Born		*				**
No	8.3	.35	2.3	.22	9.4	.38
Yes	4.3	1.16	----	----	4.7	1.18
Region				*		
Metro	8.0	.49	2.6	.32	9.2	.54
Northeast	9.1	1.04	2.1	.53	9.7	1.08
Northwest	8.9	1.09	----	----	10.4	1.21
East Central	9.7	1.25	----	----	11.0	1.32
West Central	7.3	.94	2.1	.58	8.6	1.03
Southeast	6.0	.81	2.0	.51	6.9	.87
Southwest	8.1	1.07	----	----	8.4	1.08

* p<.05; ** p<.01; *** p<.001
----estimate not considered reliable

The differences for immigration status were not statistically significant at the level of p < .001. However, the results suggest that persons who were not born in the US are somewhat less likely to have either an alcohol disorder or an alcohol or drug disorder.

Although not shown in the tables, we also examined the prevalence of substance use

disorders among persons under the legal drinking age (18 to 20 years of age). Approximately, 18% met the criteria for either type of disorder (12% for alcohol and 14% for drug). Thus, approximately 40,700 persons aged 18-20 in Minnesota meet the criteria of having a substance use disorder in 2005.

Need for Substance Abuse Treatment

Need for substance abuse treatment was defined in a manner consistent with the measure used in the National Survey of Drug Use and Health (SAMSHA, 2005) and includes persons who either met the criteria for substance abuse or dependence in the past year or who used specialty treatment services in the past year.

As shown in Table 11, more than 9% of the population was estimated to be in need of substance abuse treatment; 8% needed treatment for alcohol and 2% needed treatment for drugs (the total of these two percentages exceeds 9% because some individuals needed treatment for both alcohol and other drugs). These

Table 11. Need for Treatment for Substance Use by Demographic Characteristics						
	Alcohol Disorder		Drug Disorder		Alcohol or Drug Disorder	
	%	SE	%	SE	%	SE
Total	**8.3**	**.34**	**2.4**	**.22**	**9.4**	**.37**
Gender		***		***		***
Male	12.1	.58	3.3	.38	13.7	.63
Female	4.7	.36	1.6	.22	5.4	.38
Age (in years)		***		***		***
18-24	17.1	1.61	10.6	1.4	21.8	1.79
25-44	9.4	.52	1.9	.23	10.4	.54
45-64	6.7	.45	.8	.13	7.0	.45
65+	1.3	.29	----	----	1.3	.29
Race/Ethnicity				***		**
White	8.6	.36	2.3	.23	9.6	.39
Latino	4.9	1.26	----	----	7.4	1.90
African American	----	----	3.3	.81	7.1	1.78
Asian	----	----	----	----	----	----
American Indian	11.3	3.03	16.6	4.69	20.4	4.77
Multiple Race & Other	14.7	3.30	----	----	18.7	3.62
Foreign Born		*				**
No	8.6	.35	2.5	.23	9.8	.38
Yes	4.6	1.19	----	----	5.5	1.29
Region				*		
Metro	8.3	.50	2.8	.34	9.6	.55
Northeast	9.5	1.09	2.1	.53	10.2	1.12
Northwest	9.8	1.17	----	----	10.6	1.22
East Central	9.7	1.25	2.9	.83	11.0	1.32
West Central	7.5	.95	2.3	.61	8.8	1.01
Southeast	6.2	.83	2.7	.66	7.6	.96
Southwest	8.2	1.07	----	----	8.5	1.09

* $p<.05$; ** $p<.01$; *** $p<.001$
----estimate not considered reliable

percentages translate to an estimate of 387,600 adult Minnesotans who are in need of treatment

for alcohol or drugs in 2005. This estimate includes 342,300 adults in need of treatment for alcohol and 99,000 in need of treatment for drugs.

Two demographic factors were consistently found to be at increased risk for treatment need: gender and age. Males were over two times more likely than females to be in need of treatment for alcohol or drugs. Treatment need decreases with increasing age. Among racial/ethnic groups, American Indians reported the highest level of need for treatment for a drug-related disorder. Treatment need was not found to be significantly related to whether one was born in the US or region of residence, either due to statistical non-significance (i.e., $p > .001$) or insufficient sample sizes within the subgroups.

Mental Health

Two measures of mental health were included in the survey and considered here for analysis: a) a screener for possible depression, and b) a measure of serious mental illness. Regarding the former, the two-item Patient Health Questionnaire (PHQ-2) was used as the depression screener (Kroenke et al. 2003). The questions ask respondents how often in the past two weeks they had been "bothered by having very little interest or pleasure in doing things" or "bothered by feeling down, depressed or hopeless." To assess serious mental illness (SMI), a scale consisting of six items (K6) was included (Kessler et al. 2003). The questions were, for example, how often the respondent felt "nervous," "worthless," or "depressed" over the past 30 days. The measure is intended to capture more serious forms of mental illness that are associated with impairment in individuals' daily functioning. Whereas the NSDUH measures SMI over the past year, the Minnesota survey inquired only about the past month.

As shown in Table 12, approximately 7.7% of the adult population reported significant depressive symptoms in the past two weeks, and 2.3% of the population reported symptoms of a serious mental illness in the past month. This translates to about 317,500 adult Minnesotans in 2005 with significant depressive symptoms and 94,800 with symptoms suggestive of serious mental illness.

Race/ethnicity is also significantly associated with depressive symptoms, with Asian adults reporting the lowest rate and African Americans reporting the highest rate. A full assessment of the demographic correlates of serious mental illness is hampered by insufficient sample sizes. Nonetheless, age was found to be significantly associated with reporting SMI in the past month; older adults were much less likely to have experienced such a disorder compared to younger adults.

Table 12. Depressive Symptoms and Serious Mental Illness (SMI) by Demographic Characteristics				
	Depressive Symptoms		SMI	
	%	SE	%	SE
Total	**7.7**	**.29**	**2.3**	**.17**
Gender				
Male	7.7	.44	2.1	.24
Female	7.6	.37	2.6	.25
Age (in years)				***
18-24	8.4	1.07	3.8	.72
25-44	6.8	.45	2.6	.30
45-64	8.0	.46	2.1	.23
65+	8.4	.67	.91	.25
Race/Ethnicity		***		***
White	7.0	.29	2.0	.17
Latino	13.1	2.01	3.5	.91
African American	19.4	2.79	7.3	1.86
Asian	4.9	1.30	----	----
American Indian	12.5	3.53	----	----
Multiple Race & Other	17.1	3.11	9.0	2.49
Foreign Born		*		
No	7.5	.30	2.4	.18
Yes	10.1	1.17	2.1	.45
Region		*		
Metro	7.9	.44	2.6	.27
Northeast	7.6	.87	3.0	.62
Northwest	10.7	1.02	2.5	.57
East Central	8.2	.97	1.9	.49
West Central	8.2	.96	2.1	.47
Southeast	6.4	.74	1.8	.43
Southwest	5.7	.74	1.6	.37

* p<.05; ** p<.01; *** p<.001
----estimate not considered reliable

The treatment-seeking behavior of those with depressive symptoms or serious mental illness was also assessed by the question, "Have you ever seen a mental health provider, such as a psychiatrist, psychologist, social worker, psychiatric nurse or counselor for an emotional or

mental health problem**."** Respondents were then asked when was the last time they received such treatment.

Table 13 shows the demographic characteristics of those who reported either depressive symptoms or SMI (just over 8% of the population) and the correlates of treatment. Of the racial and ethnic groups, African Americans, Latinos, American Indians and persons who report multiple or other racial identities are most likely to experience these mental health problems.

Once again, Asian respondents provided the lowest rates of depressive symptoms or SMI. It is noteworthy that approximately 2% of the population met the criteria for both SMI and depressive symptoms (data not shown).

Only 21% of those with a mental health problem reported having received specialty mental health treatment in the past year. Women were more likely to receive treatment than were men. Although it appears that treatment receipt decreases with age, sample sizes were too small in the 65+ age category to draw conclusions about

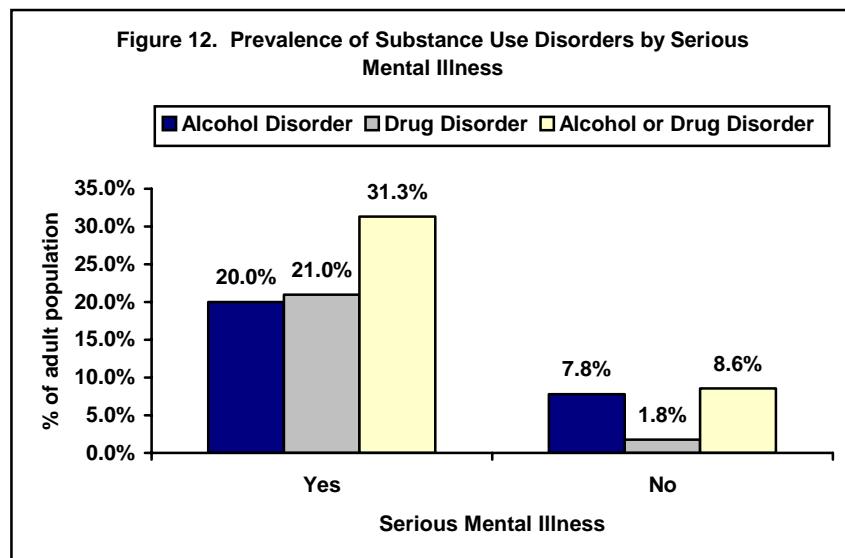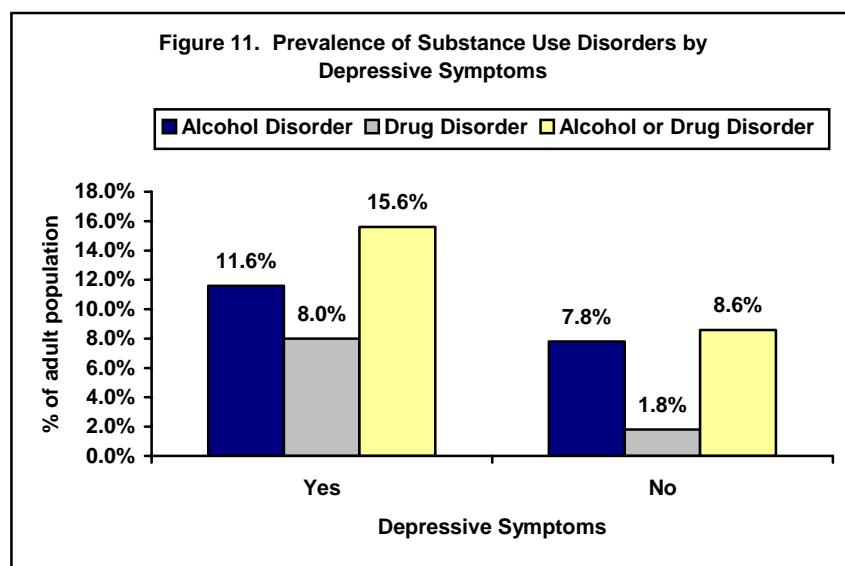| Table 13. Receipt Of Treatment Among Those With A Mental Health Problem by Demographic Characteristics				
	Depressive Symptoms or SMI		Received Treatment	
	%	SE	%	SE
Total	**8.4**	**.30**	**21.3**	**1.52**
Gender				***
Male	8.3	.46	15.5	2.05
Female	8.4	.40	26.7	2.20
Age (in years)				***
18-24	9.9	1.15	24.1	5.16
25-44	7.6	.46	26.3	2.74
45-64	8.5	.47	22.9	2.37
65+	8.6	.67	----	----
Race/Ethnicity		***		
White	7.6	.30	23.3	1.79
Latino	15.4	2.15	----	----
African American	20.9	2.82	----	----
Asian	5.8	1.58	----	----
American Indian	17.2	4.71	----	----
Multiple Race & Other	19.9	3.34	28.1	7.95
Foreign Born		**		**
No	8.1	.31	22.4	1.65
Yes	11.2	1.23	10.6	2.91
Region			*	
Metro	8.6	.46	23.5	2.31
Northeast	8.5	.94	25.5	4.99
Northwest	11.5	1.08	21.0	4.36
East Central	8.6	.98	8.8	2.73
West Central	8.6	.99	22,4	5.44
Southeast	7.2	.80	22.5	5.08
Southwest	6.3	.77	17.1	4.77

* p<.05   ** p<.01   *** p<.001
----estimate not considered reliable

this relationship. Sample sizes are also too small to draw valid conclusions about differences by

29

ethnic group. Persons born in the US who have a mental health problem are about twice as likely to receive treatment than their counterparts who were not born in the US (significant at the p<.01 level).

Psychiatric Comordity

Persons with substance use disorders often have other mental health problem such as depression (Kessler et al.1994). As shown in Figure 11, persons who met the criteria for depressive symptoms are significantly more likely to have an alcohol disorder, a drug disorder or either type of disorder than are persons who did not have elevated depressive symptoms. Indeed, persons with significant depressive symptoms are more than four times likely to have a drug disorder than their counterparts who do not experience depression.

Figure 11. Prevalence of Substance Use Disorders by Depressive Symptoms

Legend: ■ Alcohol Disorder ▨ Drug Disorder ▢ Alcohol or Drug Disorder

Y-axis: % of adult population (0.0% to 18.0%)
X-axis: Depressive Symptoms

Yes: Alcohol Disorder 11.6%, Drug Disorder 8.0%, Alcohol or Drug Disorder 15.6%
No: Alcohol Disorder 7.8%, Drug Disorder 1.8%, Alcohol or Drug Disorder 8.6%

Figure 12. Prevalence of Substance Use Disorders by Serious Mental Illness

Legend: ■ Alcohol Disorder ▨ Drug Disorder ▢ Alcohol or Drug Disorder

Y-axis: % of adult population (0.0% to 35.0%)
X-axis: Serious Mental Illness

Yes: Alcohol Disorder 20.0%, Drug Disorder 21.0%, Alcohol or Drug Disorder 31.3%
No: Alcohol Disorder 7.8%, Drug Disorder 1.8%, Alcohol or Drug Disorder 8.6%

The same pattern is observed for persons with SMI and the differences are even more

striking. As shown on Figure 12, persons with SMI are more than twice as likely to have an alcohol problem, more than 10 times more likely to have a drug disorder and more than three times as likely to have a substance use disorder compared to persons without symptoms of SMI.

Substance Use and Body Mass Index

Body mass index is used as a measure of body fat, and is calculated using formulae developed by the World Health Organization (WHO). Body mass index (BMI) is defined as weight (kg) / height (m)^2 (WHO 2000). Underweight is defined as BMI< 18.5; normal weight is $18.5 \leq$ BMI < 25; overweight is defined as $25 \leq$ BMI < 30, and obesity as BMI $\geq$ 30.

As shown on Table 14, approximately 40% of the adults are in the normal weight range, 59% are overweight or obese. Just over 1% of the population are underweight, but the sample is too small to explore demographic correlates for this group.

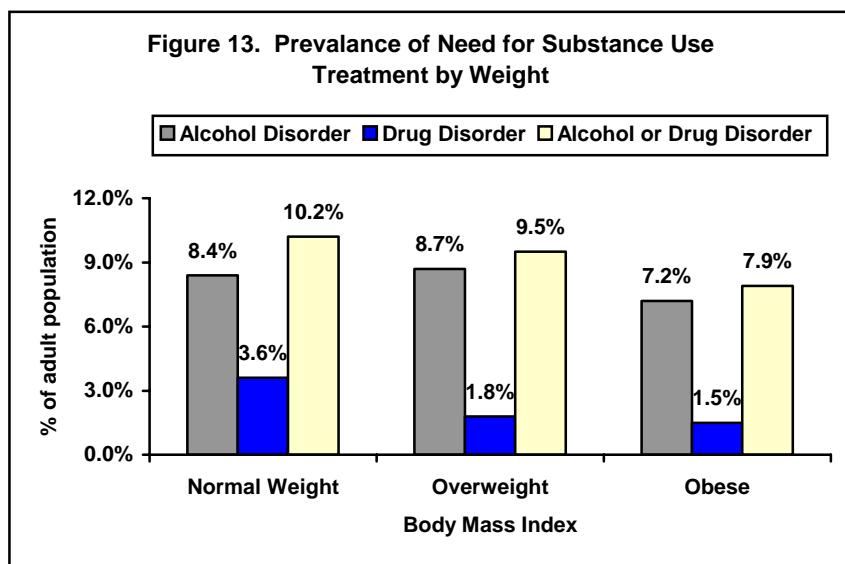| Table 14. Weight by Demographic Characteristics						
	Normal Weight		Overweight		Obese	
	%	SE	%	SE	%	SE
Total	**39.6**	**.57**	**37.6**	**.56**	**21.3**	**.46**
Gender *						
Male	31.2	.86	45.9	.89	22.3	.71
Female	47.6	.74	29.6	.67	20.4	.58
Age (in years)*						
18-24	59.9	2.07	24.7	1.85	11.8	1.26
25-44	39.9	.88	37.6	.89	21.3	.75
45-64	32.0	.86	41.0	.91	26.3	.80
65+	36.0	1.19	42.4	1.26	19.9	.98
Race/Ethnicity *						
White	39.2	.59	38.2	.58	21.3	.48
Hispanic	40.5	3.45	32.9	3.26	25.7	3.11
African American	36.5	3.26	34.6	3.15	27.6	2.93
Asian	55.0	5.17	31.0	4.94	----	----
American Indian	29.1	5.43	34.1	5.71	35.7	6.37
Multiple Race & Other	42.1	4.27	34.6	3.92	22.4	3.27
Foreign Born*						
No	39.0	.58	37.8	.57	21.9	.48
Yes	47.6	2.61	34.7	2.49	13.0	1.54
Region*						
Metro	42.9	.87	36.9	.84	18.2	.64
Northeast	35.6	1.74	38.8	1.74	24.6	1.56
Northwest	34.4	1.69	40.7	1.72	23.3	1.42
East Central	35.9	1.71	36.5	1.71	26.9	1.61
West Central	36.9	1.76	36.0	1.68	25.7	1.51
South East	37.6	1.56	38.6	1.60	22.3	1.33
South West	34.1	1.71	40.4	1.74	24.9	1.52

p<.05;** p<.01;*** p<.001
----estimate not considered reliable

Females are more likely than men to be normal weight. Older persons are more likely than younger persons to be overweight or obese. The highest rates of overweight/obesity are

observed among American Indians, with the lowest rates among Asian respondents. Persons

who were not born in the US are significantly less likely to be obese and more likely to be of

normal weight than are non-immigrants. Finally, respondents in the Metro region are more

likely to be of normal weight, and less likely to be obese than respondents in other regions.

Figure 13 shows the relationship between need for substance use treatment and BMI (sample sizes for persons meeting the criteria for underweight are too small to include this group in the analysis). The only significant difference (p<.001) is that need

Figure 13. Prevalance of Need for Substance Use Treatment by Weight

| ■ Alcohol Disorder | ■ Drug Disorder | □ Alcohol or Drug Disorder |

% of adult population

	Normal Weight	Overweight	Obese
Alcohol Disorder	8.4%	8.7%	7.2%
Drug Disorder	3.6%	1.8%	1.5%
Alcohol or Drug Disorder	10.2%	9.5%	7.9%

Body Mass Index

for treatment associated with a drug disorder appears to decline with increasing BMI.

Multivariate Results

Multivariate analyses examine the associations between demographic characteristics and substance use disorders or need for treatment, controlling other factors that may be associated with these variables.   Both the unadjusted odds ratios and the adjusted odds ratios are presented. The unadjusted odds are prior to controls; the adjusted odds control for all listed on each table in addition to marital status, employment status, household income and education.

Tables 15 through 18 present the relationships between demographic characteristics and alcohol abuse or dependence (alcohol disorder), drug abuse or dependence (drug disorder), any substance abuse disorder (alcohol or drug), and substance use treatment need, respectively. In these tables, by comparing Model I and Model II we can assess whether initial group differences may be due to differences in other demographic characteristics.

As shown on Table 15, the only demographic characteristics significantly (p<.001) associated with

Table 15. Unadjusted and Adjusted Odds for Alcohol Disorder[1]				
	Model I **UNADJUSTED**		**Model II** **ADJUSTED**	
	OR	95% CI	OR	95% CI
Gender				
Male	Reference		Reference	
Female	***.36	.29-.43	***.38	.31-.46
Age (in years)				
18-24	Reference		Reference	
25-44	***.51	.39-.66	***.55	.40-.75
45+	***.26	.20-.34	***.31	.22-.43
Race/Ethnicity				
White	Reference		Reference	
Latino	*.53	.31-.93	.52	.26-1.02
African American	.55	.27-1.14	*.45	.20-.99
Asian	.45	.13-1.52	.39	.12-1.24
American Indian	.94	.50-1.75	.80	.41-1.55
Multiple Race/Other	1.62	.96-2.75	1.39	.81-2.39
Foreign Born				
No	Reference		Reference	
Yes	*.49	.28-.86	.61	.36-1.04
Region				
Metro	Reference		Reference	
Northeast	1.15	.87-1.52	1.14	.84-1.55
Northwest	1.13	.84-1.52	1.08	.78-1.49
East Central	1.23	.91-1.68	1.04	.74-1.46
West Central	.91	.68-1.23	.91	.66-1.25
Southeast	.74	.54-1.01	*.70	.51-.98
Southwest	1.01	.74-1.38	1.00	.73-1.38

* p<.05   ** p<.01   *** p<.001
[1]Controlling for marital status, employment status, education and household income

having an alcohol disorder after we control for other demographic variables are gender and age.

African Americans are slightly less likely to have an alcohol disorder in the full model, but the

relationship is of modest strength. Similarly, persons in the Southeast are slightly less likely than

persons in the other regions to have an alcohol use disorder.

Table 16 shows parallel analyses for drug dependence/abuse. As shown, even controlling

for other demographic variables, women and older persons have lower odds of having a drug use

disorder than do men or younger persons.

Controlling for other factors, Asian Americans have significantly lower odds of having a

drug-related disorder compared to whites. African Americans also have lower odds of such a disorder (although the relationship is significant only at the p<.05 level). American Indians have odds three times higher than whites of having a drug disorder (p<.01). Controlling for other characteristics substantially reduced the coefficients for American Indian (from 8.2 to 3.3) and persons of multiple or other

Table 16. Unadjusted and Adjusted Odds for Drug Disorder[1]				
	Model I UNADJUSTED		Model II ADJUSTED	
	OR	95% CI	OR	95% CI
Gender				
Male	Reference		Reference	
Female	***.49	.34-.72	***.46	.31-.69
Age (in years)				
18-24	Reference		Reference	
25-44	***.17	.11-.25	***.32	.19-.53
45+	***.04	.03-.07	***.05	.03-.10
Race/Ethnicity				
White	Reference		Reference	
Latino	.75	.27-2.10	.36	.10-1.28
African American	1.32	.73-2.39	*.39	.18-.86
Asian	**.17	.06-.50	***.09	.03-.31
American Indian	***8.20	3.94-17.05	**3.27	1.45-7.38
Multiple Race/Other	***4.38	2.05-9.40	1.51	.55-4.18
Foreign Born				
No	Reference		Reference	
Yes	**.33	.16-.70	**.26	.10-.72
Region				
Metro	Reference		Reference	
Northeast	.79	.44-1.40.	*.50	.27-.94
Northwest	.92	.46-1.83	*.45	.21-.94
East Central	1.01	.51-1.98	.70	.36-1.34
West Central	.82	.45-1.50	.51	.26-1.02
Southeast	.78	.45-1.37	.67	.36-1.24
Southwest	**.13	.04-.42	***.11	.03-.33

* p<.05   ** p<.01   *** p<.001
[1]Controlling for marital status, employment status, education and household income

race (from 4.4 to 1.5). This suggests that at least part of the increased risk of drug disorders among these groups may be due to other factors such as educational and socio-economic disadvantage. Immigrants have significantly lower odds of a drug use disorder than those born in the-US, although the relationship is only significant at the p<.05 level. Persons in the South West region of the state have significantly lower odds of a drug use disorder than Metro residents. The Northeast and Northwest regions also have lower prevalence of drug disorder compared to the Metro region, although the relationships are only of modest strength (p<.05).

Table 17 presents similar analyses for persons with either an alcohol or a drug use disorder. Consistent with the previous analyses that examined alcohol and drugs separately, women and older persons have lower odds of having a substance use disorder than men or younger persons. In the full model, only African Americans and Latinos show lower odds of having a substance use disorder than whites, but the statistical significance does not reach the

Table 17. Unadjusted and Adjusted Odds for Substance Use Disorder[1]				
	Model I UNADJUSTED		Model II ADJUSTED	
	OR	95% CI	OR	95% CI
Gender				
Male	Reference		Reference	
Female	***.36	.30-.44	***.38	.31-.45
Age (in years)				
18-24	Reference		Reference	
25-44	***.44	.34-.55	***.53	.40-.70
45+	***.20	.16-.26	***.26	.19-.35
Race/Ethnicity				
White	Reference		Reference	
Latino	.61	.36-1.02	*.51	.26-.99
African American	.68	.38-1.21	*.48	.25-.93
Asian	.41	.12-1.34	.34	.11-1.09
American Indian	**2.24	1.22-4.11	1.74	.92-3.29
Multiple Race/Other	**1.96	1.21-3.17	1.48	.87-2.52
Foreign Born				
No	Reference		Reference	
Yes	**.47	.28-.79	*.53	.31-.89
Region				
Metro	Reference		Reference	
Northeast	1.06	.81-1.39	.99	.73-1.33
Northwest	1.15	.86-1.52	.98	.72-1.34
East Central	1.21	.90-1.62	.98	.71-1.36
West Central	.92	.69-1.23	.86	.63-1.18
South East	*.72	.54-.97	*.68	.50-.93
South West	.91	.67-1.23	.86	.63-1.17

* p<.05   ** p<.01   *** p<.001
[1]Controlling for marital status, employment status, education and household income

prescribed p<.001 level. The odds ratios for American Indians or those of multiple or other race

are reduced to non-significance. Again, this suggests that the higher prevalence of substance use

disorders for these groups may be due to social and economic disadvantage.

Immigration status is modestly associated with having a substance use disorder; persons

who were not born in the US have lower odds of having a substance use disorder than persons

born in the US.

The results shown on Table 18 examine need for treatment and they mirror those found for substance use disorders. Controlling for other factors, women and older persons have lower odds of needing treatment for a substance disorder. In addition, African Americans and Asians have lower odds compared to Whites (p<.05), and foreign-born adults have lower odds compared to persons born in the US (p<.05). Finally, persons in the South East region have lower odds of

Table 18. Unadjusted and Adjusted Odds for Need for Substance Use Treatment[1]

	Model I UNADJUSTED		Model II ADJUSTED	
	OR	95% CI	OR	95% CI
Gender				
Male	Reference		Reference	
Female	***.36	.30-.43	***.37	.31-.44
Age (in years)				
18-24	Reference		Reference	
25-44	***.42	.33-.53	***.51	.39-.67
45+	***.19	.15-.25	***.24	.18-.33
Race/Ethnicity				
White	Reference		Reference	
Latino	.76	.44-1.31	.56	.29-1.07
African American	.71	.42-1.22	*.48	.25-.89
Asian	.39	.12-1.30	*.29	.09-.95
American Indian	**2.40	1.34-4.31	1.85	1.01-3.39
Multiple Race/Other	**2.17	1.35-3.48	1.60	.96-2.67
Foreign Born				
No	Reference		Reference	
Yes	*.54	.33-.88	*.59	.36-.97
Region				
Metro	Reference		Reference	
Northeast	1.07	.81-1.40	.99	.73-1.33
Northwest	1.12	.85-1.48	.94	.70-1.28
East Central	1.17	.87-1.56	.95	.69-1.32
West Central	.90	.68-1.20	.84	.61-1.14
South East	.77	.57-1.04	*.72	.53-.99
South West	.88	.65-1.18	.84	.61-1.14

* p<.05   ** p<.01   *** p<.001
[1]Controlling for marital status, employment status, education and household income

needing substance use treatment than persons in the metro region. Race, immigrant status and

region, however, are only modestly associated with needing treatment.

IV. SUMMARY AND CONCLUSIONS

As shown in the preceding sections, substance abuse is a disorder affecting the lives of many Minnesotans. Significant numbers of adult residents abuse alcohol, illicit drugs, or both. In fact, the results of the 2004/2005 Minnesota Treatment Needs Assessment Survey show that 8% of Minnesota adults have used alcohol and suffered adverse consequences at a level within the past year that meets criteria for a clinical diagnosis of abuse or dependence using standard DSM-IV diagnostic measures. Further, approximately 2% of adults meet criteria for a diagnosis of drug abuse or dependence. Thus, in 2005 approximately 375,300 persons are estimated to have either type of substance use disorder in the past year. Combined with the group of adults who reported the use of specialty treatment services within the past year (the definition of treatment need used in the analysis), over 9% of Minnesota adults were estimated to be in need of substance abuse treatment. Although need for alcohol treatment outstrips need for drug treatment by a margin of 4 to 1, clearly those in the latter category merit continued attention in the process of substance abuse treatment

The results of the survey also suggest that a significant treatment gap currently exists. While as many as 375,300 people have a substance use disorder, only about 25,500 reported receiving specialized treatment in the past year. This means that for every one person in substance abuse treatment, about 14 people also have a disorder but do not receive treatment. Clearly, many Minnesotans in need of some form of assistance in dealing with their substance use are not obtaining it. Although the survey data themselves cannot elucidate why this gap exists, policies aimed at minimizing the personal and structural barriers to care must be crafted. Further investigation of such barriers is warranted.

It is interesting to note that the estimates of substance abuse treatment need generated by

the 2004/2005 Minnesota Treatment Needs Assessment Survey were somewhat higher than

those generated by the last substance abuse treatment needs assessment for adults that was

conducted in 1996-1997. Overall, about four percent of the population was assessed as being in

need of treatment for alcohol or drugs in 1996 and 1997 with an estimated 146,091 people

diagnosed as being in need of treatment at the time of the survey.   In the current study, about 9

percent of the population, or about 387,600 people, were estimated to be in need of substance

abuse treatment. While it is tempting to infer an increase in treatment need during the

intervening time between administration of the two surveys, much of the differential in estimates

may actually be due to substantial differences in the survey instruments, populations, and data

collection methodologies utilized in the two surveys. Specifically, the 1996/1997 and 2004/2005

surveys are very different surveys with respect to sampling, population coverage, measurement

(most notably substance abuse and dependence where the 1996/1997 survey used DSM-III-R

and the 2004/2005 survey DSM-IV-R) and data collection.   As such, the uptick in rates may

merely be methodological artifact.

The estimates of substance use disorders and need for treatment presented in this report

are based on a nationally-approved methodology. Nonetheless, they may be criticized as

providing estimates that are too liberal.   Some have argued that defining "need for treatment" in

the manner used in the current analysis overestimates unmet need. Studies have consistently

documented that the greatest disparity in diagnoses between clinical interviews and structured

lay interviews (such as those used in a household survey) arises among the respondents with

three to five symptoms (see Davis, Hoffmann, Morse, and Luehr, 1992). These "borderline

diagnosis" cases may suggest that a higher threshold might be more realistic for determining

"need for treatment."

Conversely, even if the diagnostic thresholds are specific, there are some persons who

meet the criteria who are not sufficiently distressed or disabled to seek or want treatment and others, who are disabled, will choose not to get treatment (Mechanic, 2001). The decision to seek treatment is a complex matter driven by issues such as access to health care, the severity and duration of symptoms, the disability produced by the disorder, and the perception that treatment will be effective.

Questions regarding the appropriateness of existing definitions of treatment need notwithstanding, the findings demonstrate that estimates of substance use, substance abuse/dependence and treatment need are not evenly distributed across the population in Minnesota. For example, estimates of all three were consistently and significantly associated with gender and age, where males and those aged 18 to 24 years offered the highest rates of use, abuse, and treatment need in their survey responses.

Race and ethnicity were also found to be associated with alcohol use and with the use of illegal drugs. Of note is the finding that while rates of lifetime and past year alcohol use between Whites and American Indians are at equally high levels relative to the remaining populations of color, rates of the latter outstrip the former when it comes to heavy alcohol use and use of illegal drugs. However, it is noteworthy that when taking account of other social and economic factors, the higher rates of use among American Indians are reduced. This suggests that disadvantageous social and economic conditions may partly explain the higher use of illegal drugs among American Indians. It is difficult to draw inferences from the finding that those reporting multiple or other races use at relatively high levels because the racial and ethnic composition of this group is so varied. The finding is nonetheless interesting and may be a topic of further study. It is also important to note that African Americans and American Indians in Minnesota are disproportionately incarcerated compared to other racial and ethnic groups; therefore, they are disproportionately excluded from the current study which included only non-institutionalized

adults.

Persons not born in the US appear to use alcohol and drugs at lower rates than the US born population. They are also less likely than the US born population to meet the diagnostic criteria for having a substance use disorder. However, the immigrant population is diverse, and further analyses of possible differences in alcohol and drug behavior within this group are warranted.

Finally, certain regional differences were observed where the Metro metropolitan region showed high rates of substance use relative to other parts of the state. In the multivariate analyses only one significant (p<.001) regional difference emerged: persons from the South West had significantly lower odds of reporting a drug disorder than persons in the Metro region. In their totality, these findings strongly suggest that treatment resources need to be distributed differently and targeted to at-risk groups within the state of Minnesota.

Non-medical use of prescription drugs is an area of analysis requested by DHS. Overall, almost 9% of the population – or about 350,500 people – reported misusing sedatives, tranquilizers, or pain relievers at some point in their lifetime. About one-third of that group, or 3%, indicated use in the past year. Interestingly, about 1% of those who reported non-medical use of prescription drugs in their lifetimes, reported getting their medications of the Internet. Non-medical use of prescription medications may be an emerging problem that treatment planners and researchers may need to attend to in the future.

Mental health problems continue to be a concern in Minnesota. According to the survey, approximately 346,400 adult residents have recently experienced significant depressive symptoms or symptoms suggestive of serious mental illness. The groups most likely to experience these symptoms are African Americans, American Indians, and those reporting multiple or other races. Unfortunately, of the 8% of the population with depressive symptoms or

SMI, only one in five have received mental health treatment in the past year.

Mental health disorders are also significantly associated with substance abuse or dependence. Persons who reported depressive symptoms were about 1.8 times more likely to report a substance use disorder than persons without depressive symptoms. Persons who met the criteria for SMI were almost 4 times more likely to have a substance use disorder than persons who did not meet the criteria.

The results of the survey must be qualified by known limitations to the methodology employed in the conduct of the study. First, there are several sources of error associated with all survey research even though every effort to minimize the amount of error in the estimates was taken throughout the design and implementation of this project. In studies of the relative contributions of various sources of error such as sampling error, selection bias, and measurement error such as social desirability, it is the latter source that is the principal contributor to biased survey estimates (Groves, 1991). The bias may be particularly acute for illegal drug use where fear of social disapprobation or legal sanction may attenuate the reports of such behavior. Therefore, the estimates provided in this report are likely to be under-estimates of actual substance abuse treatment need.

Second, the current study employed a telephone survey methodology as its only source of data collection. The implication of sole use of this methodology is two-fold. First, the relevant literature suggests that substance use, particularly illegal drug use, is under-reported in telephone surveys relative to mailed surveys and personal, face-to-face interviews (Gfroerer & Hughes, 1991; Johnson et al., 1989). Second, by definition a telephone survey of the population excludes those without telephones. Recent evidence suggests that households *with* telephone service have less drug use, less dependence on drugs or alcohol, but also more alcohol use than households without telephone service (McAuliffe et al, 2002). However, that same evidence shows that the

size of the bias is quite small, and the difference in estimates between households without telephone service and all respondents is less that one tenth of one-percent. Even among sub-groups at greatest risk of non-telephone service, the estimated bias is small. Moreover, we did make an adjustment to the weights to account for telephone service interruption (see Appendix A). Nonetheless, these two factors in tandem again may suggest that the substance use estimates provided herein may under-represent actual use rates, particularly for illegal drugs.

Third, the sample design for this study excluded children and those residing in institutional settings. Inclusion of the former would likely lower the estimates while inclusion of the latter, particularly if they resided in correctional facilities, would likely have the effect of raising the estimates. Nonetheless, inferences from the study findings can only be made to non-institutionalized adults in Minnesota.

In conclusion, use and abuse of, dependence on, and treatment need for alcohol still outpaces similar measures of illegal drug use in Minnesota. A significant number of residents continue to be in need of treatment services for either or both. Just under one in ten Minnesota adults was estimated to be in need of substance abuse treatment in the past year. One should be cautious, however, in concluding that *all* of these individuals should be targeted for treatment. For example, efforts to get the 1 in 5 young people ages 18-24 (those who meet the formal criteria for need for treatment used in this project) into treatment would prove both costly and ineffective. Further attention needs to be given to identifying those who are most likely to benefit from such treatment. Moreover, given the high prevalence of substance use among this group, population based efforts aimed at prevention may prove more effective than efforts focused on treating individual persons.

While one should be cautious about defining 'need' for treatment, the finding that only 7% of those with a substance use disorder receive any specialty treatment is a cause for concern.

Further assessment of barriers to care is clearly warranted as is the finding that substance abuse estimates vary significantly by sociodemographic status, race and ethnicity, and region.   Finally, nascent disorders with depressive symptoms and serious mental illness as well as psychiatric and substance abuse co-morbidity will pose challenges to policy makers and treatment planners in the near future. These groups should also consider the issue of non-medical prescription medication use the subject of ongoing surveillance.

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APPENDIX I: TECHNICAL APPENDIX

I. Sampling

The project was designed to obtain estimates of need for substance use treatment for a representative sample of non-institutionalized adults living in Minnesota in addition to estimates for 9 geographic strata, African Americans, American Indians, Latinos, Hmong Asians and non-Hmong Asians. An additional strata was added (Olmsted county) after the project was fielded. Although this portion of the data collection was not funded by the Department of Human Services (DHS), the cases were added to the final data set used in the analyses. Thus, there are a total of 10 geographic strata in the final data set. A stratified random sample design was employed.

Throughout the process of data collection, the number of completes in each strata were monitored and sample release was adjusted according to the number of completes needed. These efforts indicated that completes in the African American strata were falling short of the target. The sampling design was revised to increase the number of targeted completes in the African American Strata to 1600 and decreased those in the Saint Paul strata to 1050 and those in the Minneapolis strata to 1475. In addition, a further 75 elements were allocated to the Asian surname sample because data collection efforts achieved more completes than anticipated in this strata. (See Table 1 for a description of the original targets for each strata (Design 1) and the revised targets (Design II).

Table 1. Targeted Number of Completes by Strata			
Strata	Source of Sample	Design I	Design II
1. Northeast	Telephone exchanges in region	1000	1000
2. East Central	Telephone exchanges in region	1000	1000
3. Minneapolis	Telephone exchanges in region	1600	1475
4. Saint Paul	Telephone exchanges in region	1600	1050
5. Suburban Metro	Telephone exchanges in region	2840	2840
6. Southeast	Telephone exchanges in region	1000	1000
7. Southwest	Telephone exchanges in region	1000	1000
8. West Central	Telephone exchanges in region	1000	1000
9. Northwest	Telephone exchanges in region	1000	1000
10. African American/African American	Telephone exchanges in counties >=15% density of target population	1000	1600
11. American Indian	Telephone exchanges in counties >=10% density of target population	1000	1000
12. Latino Surname	Telephone numbers associated with identified surnames	850	850
13. Hmong Surname	Telephone numbers associated with identified surnames	425	425
14. Asian Non-Hmong Surname	Telephone numbers associated with identified surnames	425	500
15. Olmsted county	Telephone exchanges in county	-----	250
TOTAL		15740	15990

Table 2 shows the number of completed interviews in each strata. As shown, the project reached at least 90% of all targets. The final data set includes 16,891 cases, 901 more than targeted and 1,891 more than were required by the contract.

II. Selection of households

The project team did not sample individuals within each strata, but instead sampled active phone numbers, through random digit dialing (RDD). Phone numbers consist of three pieces: XXX-YYY-ZZZZ. The XXX is called an "area code", the YYY is called an "exchange", and the ZZZZ is called a "stem". For the geographic strata, active area codes plus exchange groupings within each region were eligible for inclusion. For the American Indian and African American strata, active phone numbers within areas of the state that had a high concentration of these groups were eligible for inclusion. For the Latino, Asian-non Hmong, and Hmong strata, sampling was based on surname associated with these ethnicities; active phone numbers associated with specific surnames were eligible for inclusion in the sample.

Table 2. Completes by Strata		
Strata	Completes	% of Target
1. Northeast	1093	109.3
2. East Central	1090	109.0
3. Minneapolis	1497	101.5
4. Saint Paul	1288	122.7
5. Suburban Metro	2965	104.4
6. Southeast	1121	112.1
7. Southwest	1052	105.2
8. West Central	1070	107.0
9. Northwest	997	99.7
10. African American	1452	90.8
11. American Indian	977	97.7
12. Latino Surname	929	109.3
13. Hmong Surname	479	112.7
14. Asian Non-Hmong Surname	572	114.4
15. Olmsted county	309	123.6
TOTAL	16891	

The stems within an active area code plus exchange group are divided into 100 groups of 100 consecutive telephone numbers (called 100 banks) and telephone numbers are randomly drawn from 100 banks with at least one listed telephone number in the interval. Sample from the geographic strata and the oversamples of American Indians and African American are distributed within banks of phone numbers.

Some numbers are then removed from these 100 banks and put into a different strata if they were listed telephone numbers and the name listed matched the name on our Latino surname list, our Hmong Asian surname list and our non-Hmong Asian surname list. These numbers were removed from the 100 banks and grouped into three separate strata: (1) Latino surname strata, (2) Hmong Asian surname strata, and (3) Non-Hmong Asian surname strata.

III. Within Household Selection

The survey was fielded using the 'next birthday' method to randomly select an adult respondent within a household. Using this method, the person who answers the phone is asked which adult in the household has the next birthday and that individual is the person who is chosen to conduct the interview. This method was selected after consultation with the Survey Center because of concerns that alternative methods might be less cost effective and would not improve the random selection of adults within households.

Data tracking indicated that the gender distribution of completes was more skewed toward woman than what one would expect by chance. For example, after the first 5000 cases were collected, it was observed that completes were approximately 60% female and 40% male for the total sample, and 57% female, 43% male in households with married or cohabitating persons).

Concerns have been raised in the literature that the 'next birthday' method of within household selection may not yield true probability samples because of two sources of error: 1) interviewers may accept the person answering the phone as the respondent to reduce interviewer effort and save callback time, or 2) persons answering the phone may indicate that they have the next birthday (even when this is not the case). Because women are more likely to answer the telephone, the resulting gender distribution of respondents becomes skewed. Training of interviewers addressed the first type of error; interviewers were re-trained about the importance of random selection within households approximately 1/3 the way through data collection.

To address the second possible type of error, the project team (with the consent of DHS) decided to experiment with an alternative method of within household selection that might improve the gender distribution[7]. This method preserves the probability sample within households while being minimally intrusive for the respondent who answers the phone. When there is only one adult in the household that person is automatically included in the sample. If there are more than one adult in the household, the computer samples the person on the phone with a probability of 1/(number of adults in the household). If the adult who answered the phone is selected there is no need to go to the next step of the screening process. If the adult who answered the phone is not selected and the number of adults in the household is two, than the other adult is selected. If there were three or more adults within the household (and the screener is not chosen) the "'next birthday technique" was used to pick one of other adults who did not answer the phone. If the most recent birthday was not known or the next birthday was shared by more than one person within the household, the system requested a list of household members by age and gender. A respondent was then chosen by the CATI system (for example, the male who is 24 years old). This selection method has been demonstrated to be technically equivalent to the use of a "random respondent selection grid" [8]. It is also less burdensome for both the respondent and the interviewer.

To date, there is not sufficient research evidence to definitely demonstrate that this method results in improved probability sampling within households. Thus, it was decided that it was better to complete an experiment to test the method, rather than to assign all remaining sample to the new method. Approximately 8592 cases were allocated to the experiment, with 38% to the experimental group (new method) and the remainder to the old method. The final sample resulted in 1086 completes from the experimental group. The results of this experiment for improving the gender distribution of the sample will be presented in subsequent research.

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[7] Rizzo, Louis, J. Michael Brick and Inho Park. 2004. "A Minimally Intrusive Method For Sampling Persons in Random Digit Dial Surveys" *Public Opinion Quarterly* 68:2:267-274.

[8] O'Rourke, D, and Blair, J. 1983. "Improving Random Respondent Selection In Telephone Surveys" *Journal of Marketing Research*, 20: 428-432.

IV. American Indian Strata

While the survey was in the field, the community of Red Lake experienced a tragedy that lead to revised data collection. On March 21, 2005 a student entered Red Lake High School and, following a shooting spree, left 10 people dead (including himself) and 12 others wounded.

The project team decided to temporarily suspend data collection in the region. Continuing data collection at

Table 3 Red Lake Shooting Incident Changes in Data Collection Protocol	
DATE	**RESPONSE**
3/21/05 (5:30 p.m)	Pulled all 218 Area Codes except Duluth and eastern part of 218 Area Code
3/24/05	Plotted on State of MN map areas to include - started by putting back out in the field areas most distant from Red Lake
3/24/05-4/12/05	Continued to add back communities and areas leaving a circle around Red Lake area
4/13/05-4/24/05	Continued to re-introduce sample to the field, except Red Lake itself
4/25/05	Red Lake returned to the field

the time would have been insensitive to the feelings of persons directly or indirectly affected by the tragedy and would have resulted in a high number of non-responses in the area. The revised data collection protocol devised after the tragedy in Red Lake is described in Table 3.

V. Weighting

Given the stratified sampling design, the sampled elements must be weighted to account for the differential probabilities of selection, prior to data analyses. The aim of weighting survey data is to make the selected respondents representative of the population. This is accomplished by weighting respondents relative to their probability of selection into the sample. This process is made more difficult by the fact that not all the respondents have the same probability of inclusion into the sample. The probability of selection varied by: (1) stratum (i.e., Latino surname, Hmong surname, American Indian over-sample area, and other geographic areas), (2) number of phone lines in household, and (3) the number of adults living in a household. Each of these is discussed in more detail below. Weighting the respondents relative to their probability of selection into the sample accomplishes two key goals: (1) having the sampled respondents represent the population of Minnesota, and (2) controlling for the fact that the respondents did not all have the same probability of selection into the sample.

Basic Probability

An important assumption in our weighting scheme is that within each stratum each phone number has an equal probability of selection. Then the basic probability is equal to:

Probability of selecting a phone number (PSPN) = *(total number of phone numbers selected into the sample) / (total number of phone numbers from which the sampled numbers were drawn)*

The total number of phone numbers from which the RDD sampled numbers were drawn was determined by how many "100 banks" were used by the vendor (Genesys Marketing Systems Group) minus those telephone numbers allocated to a surname stratum. All possible numbers from an (area code + exchange) combination were broken down into intervals of 100 (for example, 612-673-0000 to 612-673-0099). If there was a listed telephone number within the interval of 100 numbers, then all the numbers within the 100 bank were eligible to be sampled. The denominator was, therefore, the number of banks used for sampling within the state multiplied by 100, minus those numbers selected to be in the surname strata. The total number of phone numbers selected into the sample was determined by counting the telephone numbers actually called as part of the survey.[9]

Efficiency Rate Adjustment
The probability of selecting a phone number within a stratum is further adjusted by the efficiency rate. For the purpose of weighting, the efficiency is defined as the total number of completed surveys, divided by the total number of phone numbers in the sample.

> ***Efficiency rate adjusted probability of selecting a phone number*** $=$ *(efficiency rate) * (probability of selecting a phone number)*

Table 4 contains the total number of telephone numbers in each strata eligible to be sampled, the number selected and fielded in each stratum, and the number of completed surveys within each strata. This information can be used to calculate the efficiency-rate-adjusted probability of selecting a telephone number. The inverse of this is the basic starting weight that can be assigned to each case within a stratum to obtain a weighted response rate.

Table 4: Probability of Selecting a phone number and basic weight

Stratum Number	Stratum (S)	Total Phone Numbers in Stratum	Numbers Selected Into the Sample	# of Completed Surveys (C)	Efficiency Rate Adjusted Probability of Selecting a Phone Number	Basic Weight (BW)
1	Northeast	300096	2543	1093	0.00364	275
2	Mideast	506935	2629	1090	0.00215	465
3	Minneapolis	217843	3754	1497	0.00687	146
4	Saint Paul	184229	3285	1288	0.00699	143
5	Suburban Metro	2156941	8529	2965	0.00137	727
6	Southeast	359759	2736	832	0.00231	432
7	Southwest	611187	2594	1052	0.00172	581
8	Midwest	378901	2678	1070	0.00282	354
9	Northwest	260301	2526	997	0.00383	261
10	Black/African American Oversample	375535	4886	1452	0.00387	259
11	American Indian Oversample	49460	2930	977	0.01975	51
12	Hispanic Surname Oversample	26746	1950	929	0.03473	29
13	Hmong Surname Oversample	7965	1680	479	0.06014	17
14	Asian Surname Oversample, Non Hmong	19671	1400	572	0.02908	34
15	Olmsted Oversample	94220	864	598	0.00635	158

As shown on Table 4, for purposes of weighting we combined elements from the Southeast region that were from Olmsted county with the Olmsted county over-sample.

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[9] Genesys' screening process screens out business numbers through cross-listing the numbers with listed businesses, and Genesys dials the remaining numbers to screen out additional business lines and disconnected numbers as well.

Phone Line Adjustment

The efficiency rate adjustment is not equal to the probability of selecting any one household because households have an unequal number of phone lines leading to them. We can use the number of phone lines connected to a household to adjust a household's probability of selection into the sample.[10] Information regarding the number of residential phone lines in each respondent's home is collected as part of the interview and it is used to make the following adjustment to the efficiency rate adjusted probability of selecting a phone number:

Probability of selecting = *(number of phone lines within a selected household) ***
a household   *(efficiency rate adjusted probability of selecting a phone number)*

Basic Person Probability

The purpose of the weighting scheme was to develop person weights. Within each household only one adult was selected for an in-depth interview. In general, adults in households with more adults have a smaller probability of being included than adults living by themselves. The ultimate probability of selecting a person is equal to:

Probability of selecting = *(probability of selecting a household) ***
a person   *(1/the number of adults living in the household)*

Basic Person Weight

The basic person weight is equal to the inverse probability of selecting a person, or:

Basic person weight = *1/probability of selecting a person*

Post-stratification

The goal of post-stratification is to adjust the person weights to match known population distributions of a given group.

Post-stratified weight = *(basic person weight of the person in a group) ***
((known population distribution for group) / (sum of the basic person weights in a post-stratified grouping))

Post-stratifying the basic person weights adjusts for differential survey non-response by making the sum of person weights equal to known population distributions. For the Minnesota Needs Assessment Survey we set the population total to the current US Census Bureau

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[10] This number was not allowed to exceed three, even though some households have more than three phone lines. This is to reduce the heterogeneity of the weights and follows standards of survey sampling. See Lepowski,. 1988. "Telephone Sampling Methods in the United States." Pp. 73-98 in *Telephone Survey Methodology*, edited by Robert Groves et al. New York: John Wiley & Sons.

population estimate for the Minnesota population aged 18 and over on July 1, 2003: 3,813,143[11]. Table 5 contains the post-stratification proportions we used to adjust the data for the gender distribution, racial distribution, and regional distribution in the US Census Bureau population estimates for July 1 2003.[12] We first set the weights equal to the regional proportions for the 10 geographic regions that formed the survey strata, then the 14 age categories, then the five race/ethnicity categories, then the 2 gender categories [13]. The composition of these categories and their percentage share of the 2003 Minnesota adult population are shown in Table 5.

Telephone Service Interruption Adjustment

We used a two year average from the 2003-2004 Current Population Survey Annual Social and Economic Supplement (CPS) to estimate the number of adults living in households without telephones in Minnesota to perform the non-telephone coverage adjustment on the data. The rationale for this adjustment is that those people who lacked phone service for a week or longer during the past year are very similar to those who do not have service. For example, research indicates that people who did not lack phone service differ with respect to health insurance coverage from those who did or those who did not have phones at all. According to the CPS two year average 2.1% of adults in Minnesota live in households without phone service and therefore 2.1% is added to the weight of those who lacked phone service for a week or longer and 2.1% is subtracted from those who did not lack phone service for a month or longer (see Davern, et al. 2004 for a detailed description of this technique as applied to state telephone surveys of health insurance coverage)[14].

As all these adjustments are sequential and the earlier adjusted numbers can change with each additional adjustment, we made one final adjustment using the post-stratification cells in Table 5 for age, and race and two final adjustments for region. After this all the percentage totals from the weighted data were very close (plus or minus .2% for all estimates, and less than .1% for the vast majority of estimates) to Census Bureau nubmers.

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[11] Estimates from 2004 that include race/ethnic distribution of the Minnesota adult population are not yet available from the US Census Bureau.

[12] This follows the method to estimate population controls used by the recent Minnesota Health Access Survey, funded by the Department of Health, State of Minnesota.

[13] Consistent with method developed for the Minnesota Health Access Survey in cooperation with the Minnesota Department of Health (Health Economics Program)

[14] Davern, Michael, James Lepkowski, Kathleen Thiede Call, Noreen Arnold, Tracy L. Johnson, Karen Goldsteen, April Todd Malmov and Lynn A. Blewett. 2004. "Telephone Service Interruption Weighting for State Health Insurance Surveys." *Inquiry 41(3): 280-290.*

Table 5: Comparison of Sample Distribution Pre- and Post-Stratification with Census Estimates of the Minnesota Adult (18 and over) Population by Region, Age, Race, and Gender

	Census[15]	Pre-Stratification	Post-Stratification
REGION			
Hennepin	22.5	23.1	22.2
East Central	10.4	9.5	10.5
West Central	6.3	6.8	6.3
North East	6.7	5.6	6.7
North West	3.9	5.1	3.9
Olmsted	2.6	1.8	2.6
Ramsey	10.0	9.1	9.9
South East	6.9	6.5	6.9
South West	10.3	11.7	10.3
Metro	20.6	20.7	20.6
TOTAL	100.0	100.0	100.0
AGE GROUP			
Age			
18 to 24 years	13.7	9.0	13.8
25 to 29 years	8.4	7.8	8.4
30 to 34 years	9.2	8.5	9.3
35 to 39 years	9.9	9.6	9.9
40 to 44 years	11.2	11.3	11.2
45 to 49 years	10.4	11.9	10.5
50 to 54 years	8.9	11.3	9.0
55 to 59 years	6.9	8.6	6.9
60 to 64 years	5.3	6.3	5.3
65 to 69 years	4.1	4.7	4.2
70 to 74 years	3.7	4.0	3.6
75 to 79 years	3.2	3.4	3.2
80 to 84 years	2.4	2.1	2.4
85+ years	2.5	1.5	2.4
TOTAL	100.0	100.0	100.0
RACE/ETHNICITY			
Latino	2.7	2.9	2.7
White only, Non-Latino	89.4	90.1	89.3
African American only, Non-Latino	3.3	2.8	3.3
Asian only	2.9	1.5	2.9
American Indian only	9	.8	.9
Two or more races and other	.8	1.9	.8
TOTAL	100.0	100.0	100.0
GENDER			
Male	49.1	40.5	48.9
Female	50.9	59.5	51.1
TOTAL	100.0	100.0	100.0

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[15] Based on US Census Bureau estimates of the Minnesota adult population as of July 1, 2003. The Minnesota adult population estimate is 3,813,143.

Working with the Weighted Data

Use the person weight variable (personwt) when analyzing the Minnesota Needs Assessment data to control for all the differential probabilities of selection that were both by design, due to random error, coverage error and due to non-response error. In addition, when analyzing the data also make sure to use the strata variable (strata) and the survey commands that control for complex survey designs in Stata, SAS, SPSS, or SUDAAN. Doing so will not alter the point estimate but will (in almost all cases) increase the size of the standard error to adjust for the complex survey design.

VI. Response Rate:

Table 6 describes the final dispositions and response rates for sampled elements in the DHS-funded study (N=16530). Disposition codes and calculation of response rates are consistent with those outlined by the American Association for Public Opinion Research (AAPOR)

Table 6. Final Dispositions and Response Rates		
Disposition		**Frequency**
1.100	Complete	16839
1.200	Partial	52
2.111	Household -level refusal	5370
2.112	Known respondent refusal	3065
2.210	Respondent Never Available	641
2.320	Unable/incompetent	289
2.330	Language	864
3.120	Always busy	374
3.130	No answer	2888
3.140	Ans device/unknown house	1697
3.160	Technical phone problems	133
4.100	Out of sample	508
4.200	Fax/data/child line	2819
4.300	Non-working/discon#	5491
4.420	Cell phone	434
4.510	Bus/gov/office	3228
4.520	Institution	288
4.700	No eligible respondent	3
Response Rates		
	RR1	52%
	RR4	55%

Calculation of Response Rates:

RR=Response Rate

I=Completed interview (1.1)

P=Partial interview (1.2)

R=Refusal and Breakoff (2.1*)

NC=Non-contact (2.2*)

O=Other (2.3*)

UH=Unknown if household

occupied/HU (3.1*)

UO=Unknown, other (3.2*)

E=Estimated proportion of cases of

unknown eligibility that are eligible.[16]

$$RR1 = \frac{I}{(I + P) + (R + NC + O) + (UH + UO)}$$

$$RR4 = \frac{(I + P)}{(I + P) + (R + NC + O) + e(UH + UO)}$$

Table 7. Response Rates by Strata		
Strata	**RR1**	**RR4**
Northeast	58%	60%
Mideast	55%	57%
Minneapolis	54%	57%
Saint Paul	54%	57%
Suburban Metro	48%	51%
Southeast	59%	60%
Southwest	58%	60%
Midwest	57%	60%
Northwest	55%	58%
Black/African American Over-sample	43%	49%
American Indian Over-sample	54%	58%
Hispanic Surname Over-sample	66%	67%
Hmong Surname Over-sample	37%	37%
Asian Surname Over-sample	51%	52%
Olmsted County	51%	54%

While there a number of methods for calculating e, for the purposes of this report we choose the most conservative approach, according to AAPOR guidelines. Thus, e is estimated by calculating the proportion of eligible cases among those with a known determination of eligibility.

Table 7 shows RR1 and RR4 for each strata. For the total sample, RR1=52% and RR4=55%   Table 8 shows the various measures of response rate, cooperation rates and refusal rates, calculated according to AAPOR standards.

The weighted response rate (see Table 3)

$$= \frac{\Sigma (RR_s \times (C_s \times BW_s)}{\Sigma (C_s \times BW_s)} = .52 \text{ (RR1)}; .55 \text{ (RR4)}$$

Table 8 provides an overview of measures of participation.

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[16] There are a number of methods for calculating e. We have used a conservative method (compared to the computation proposed in the sampling plan). The "estimate of e is based on the proportion of eligible households among all numbers for which a definitive determination of status was obtained " (http://www.aapor.org/Calculator.xls).

Table 8. Measures of Participation (Unweighted)	
Response Rate 1	
I/(I+P) + (R+NC+O) + (UH+UO)	0.52
Response Rate 2	
(I+P)/(I+P) + (R+NC+O) + (UH+UO)	0.52
Response F Rate 3	
I/((I+P) + (R+NC+O) + e(UH+UO))	0.55
Response F Rate 4	
(I+P)/((I+P) + (R+NC+O) + e(UH+UO))	0.55
Cooperation Rate 1	
I/(I+P)+R+O)	0.64
Cooperation Rate 2	
(I+P)/((I+P)+R+0))	0.64
Cooperation Rate 3	
I/((I+P)+R))	0.66
Cooperation Rate 4	
(I+P)/((I+P)+R))	0.67
Refusal Rate 1	
R/((I+P)+(R+NC+O) + UH + UO))	0.26
Refusal Rate 2	
R/((I+P)+(R+NC+O) + e(UH + UO))	0.28
Refusal Rate 3	
R/((I+P)+(R+NC+O))	0.31
Contact Rate 1	
(I+P)+R+O / (I+P)+R+O+NC+ (UH + UO)	0.82
Contact Rate 2	
(I+P)+R+O / (I+P)+R+O+NC + e(UH+UO)	0.87
Contact Rate 3	
(I+P)+R+O / (I+P)+R+O+NC	0.98

VII. Data Cleaning

Initial data cleaning was done by the Survey Center throughout data collection. The Survey Center primarily checked open-ended text fields and, where appropriate, edited the answers to fit into the existing response options on the survey. After the survey left the field, the project team further analyzed the open-ended text fields, and where appropriate edited responses. The project team also checked for logical inconsistencies in the data and checked skip patterns. The project team checked the algorithm for defining respondents who met the screening criteria for alcohol or substance use.

Imputation

      In survey research there is a substantial amount of missing data for certain types of items (e.g., income) because of two reasons: (1) survey respondents either refusing to answer the question or providing a 'don't know' response for some reason; (2) errors in interviewer procedures or computer programs causing some respondents to skip questions that they should have answered.

      For the Minnesota survey data, we will use "hotdeck" imputation for some variables. Hotdeck is a process by which a respondent's valid value for a specific variable is assigned to another respondent who does not have a valid value for this variable. The respondent with the valid value is called a "donor" and a person with a missing value is called a "recipient." For example, if the donor is 35 years old, then the recipient (respondent with missing age) is given a value of 35 and the donor maintains the age of 35.

      The process of selecting a donor is the most important component of the hotdeck procedure. Potential donors are sectioned into homogeneous groups called "cells" defined by many parameters. For example, all white, unemployed, college educated, males over the age of 65 with a valid value for the specific variable can be placed into one cell, while all non-white, unemployed, college educated, males over 65 can be placed into another cell. Recipients are matched to these homogenous cells of donors based on their characteristics. A random donor selected from the matching group supplies his/her value to the recipient.

      The characteristics used to group the respondents should be highly correlated with the variable being imputed. For example, when imputing income, donors are matched with recipients based on highest educational level because education is highly correlated with income. The variables chosen to match the donors and the recipients form the basis of a "model" for predicting the imputed variable. A good imputation procedure should provide unbiased estimates of the mean and variance of the variable by correcting for potential distributional differences between people with and without reported data. The basic underlying assumption is that the value of the variable being estimated is not conditional on (i.e., moderated by) the missing data mechanism. For example, all those respondents with missing smoking data do not have a different relationship between smoking and other covariates than all the respondents with reported data.

      Although properly specified imputation can alter basic distributional summary statistics (means and variances) from the statistics calculated using complete cases only, it should not transform the relationships among variables. If there was a relationship between two variables in the reported data it should be the same in the imputed data, and no new relationships should appear after the imputation. The basic idea of model-based (particularly hotdeck) imputation is to use the existing relationships within the reported data to adjust for distributional differences among those who are likely to report data and those who are less likely.

      The hotdeck is limited in the number of "variable levels" it can have. For example, the variable "highest degree attained" can be broken down into three variable levels (or cells) for the hotdeck; less than high school, high school diploma and college degree. The number of hotdeck cells is equal to the product of the number of variable levels used to match donors with recipients. If there are too many variable levels used in the hotdeck, then many of the cells will not be populated with donors. The more variable levels that are used (i.e., the more hotdeck cells), the more donors are needed for the hotdeck to work.

    The models for imputation were as follows:

a) Income: imputation based on education, age, sex, race, number of adults in household, and residence in metro area or not
b) Missing Alcohol Questions (Time since last drank 4/5+ drinks on same occasion, number of days in past month had 4/5+ drinks; ever gone on a binge, time since last went on a binge) due to skip problem: imputation based on age, gender, race, time since last drank, frequency of drinking and whether they had 4/5+ drinks in the past year
c) Missed Alcohol Screen: (impute diagnostic and behavior questions): imputation based on age, gender, race, ever had 4 /5+ drinks in past year, ever gone on a binge, ever thought had a problem with alcohol
d) Missed Drug Screen: (impute diagnostic and behavior questions): imputation based on age, gender, race, alcohol screen, type of drug, when last used, frequency of use, thought had a problem with drug.

VIII. Measures

The survey team began by modifying the questions used in the State Treatment Needs Assessment Program, an interview protocol developed by the Center for Substance Abuse Treatment to assess need for substance use treatment within states. The full survey is provided in a separate document; only measures used in this report are described in detail below.

1.   Demographic Information: Demographic information included gender, age, race/ethnicity, education, employment status, region of residence and household income. Respondents were asked to report their age in years; if they refused, they were asked to report their age in categories (less than 20, 20 to 29 etc.). For those who did not want to report their age in years, but answered the categorical question, age was assigned as the midpoint of the categorical response.

Similarly, respondents were asked to report their annual household income (including salaries or other earning, interest, retirement income etc.) in dollars. For those who refused, categorical response options were offered (less than $25,000, more than $25,000 etc.). Those who answered the categorical question were assigned the midpoint of the category as their household income. As in other studies, many respondents (N=1492) refused to report their household income. For these respondents, household income was imputed as described in the data cleaning section of this report.

Consistent with standards used by the Census bureau, questions about ethnicity and race were asked separately. The survey instrument allowed respondents to report multiple racial identities (for example, one could self-identify as Asian and White). Responses to questions about ethnicity and race were combined to create mutually exclusive categories. Latino ethnicity was assigned first, thus, the remainder of the categories (White, African American, Asian, American Indian, and Multiple Race and other denote persons who do not self-identify as Latino. The number of persons who self-identified as a race other than those listed was too small (N=10) to permit separate analyses.

2. Cigarette Use: Respondents who indicated that they had ever smoked at least 100 cigarettes in their life were categorized as meeting the criteria for lifetime cigarette use. Those who indicated that they now smoked every day or smoked at least one cigarette in the past 30 days were categorized as smoking in the past month.

3. <u>Alcohol Use</u>:   Respondents who indicated that they had ever drank twelve or more drinks in any year of their life were categorized as meeting the criteria for lifetime use of alcohol.. We also distinguish between respondents who indicated that they last had a drink in the past year and those who last drank in the past month.

A measure of binge drinking was also computed. The NSDUH defines binge drinking as 5 or more drinks on one occasion. The Minnesota survey did not include the information necessary to directly parallel the NSDUH measure. In the Minnesota survey, binge drinking in the past year is defined as consuming 4 or more drinks for women, and 5 or more drinks for men on one occasion.

Heavy drinking was defined as having consumed 4 or more drinks for women and 5 for more drinks for men on at least 5 occasions in the past 30 days.

4. <u>Drug Use</u>: Respondents were asked if they has ever used 10 specific types of illegal drugs: marijuana or hash, powder cocaine, crack cocaine, heroin, methamphetamine, other stimulants or 'uppers', hallucinogens, club drugs, opium or khat. To measure potential prescription drug abuse, respondents were asked about if they ever used three types of prescription drugs (pain relievers, tranquilizers or sedatives) "on your own – that is, either outside prescribed use or that you took for the experience or the feeling they caused. Those who indicated that they had used the drug were asked further questions about recency and frequency of use. They were also asked if they ever thought they had a disorder with their use of the drug.

5. <u>Substance Abuse or Dependence</u>: Substance abuse or dependence was defined consistent with criteria from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). DSM-IV is a compilation of diagnostic criteria for various mental disorders. It distinguishes between substance dependence and abuse, with dependence being the more severe form of disorder.

To be eligible for the questions used to construct the diagnostic measures, respondents had to screen positive on either the alcohol or drug screener. A positive alcohol screen required drinking once a week or more in the past year and responding 'yes' to one of the following questions: 1) ever had a problem with alcohol or binged in the past 12 months; 2) averaged 3 or more drinks per occasion or had 4 or more drinks at least one in the past 12 months (for females); 3) averaged 4 or more drinks per occasion or had 5 or more drinks in the past 12 months (if male).

Positive drug screens required using any of the illegal or prescription drugs once a month or more. Persons who screened positive for alcohol use or drug use were then asked a series of questions about symptoms and behaviors that may be indicative of abuse or dependence Disorders.

A diagnosis of dependence requires meeting three or more of the seven criteria that include symptoms such as tolerance, withdrawal, disorders in the fulfilling role requirements at work or with family, and failed attempts to control substance use. We operationalized the definition of dependence consistent with that done with similar questions in Iowa's state survey of drug and alcohol use.[17] The specific criteria are listed on Table 9.

Table 9
DSM-IV Criteria: Substance Dependence
(3 or more of following symptoms)
1. Tolerance: Item: E3: Using same amount of alcohol/drug had less effect or took more to feel the same effect [yes]
2. Withdrawal: symptoms when drug/alcohol wearing off Items: E9a through E9j [yes for at least one symptom] E10 Took drug/alcohol to cure these problem [yes] [yes to either]
3. Take substance in larger amount than intended Item: (E2): [yes]
4. Efforts to cut down unsuccessful E7: Wanted to stop using or cut down more than once, but found you couldn't E8: Made rules about where, when, or how much you would use than broke rules more than once [yes to either]
5. Spent a lot of time using alcohol/drug, getting over its effects or obtaining it Item: E1 [yes]
6. Impaired Role Performance Item E4: Use of substance often kept you from going to school, taking care of children, or taking part in recreational activities
7. Continued use despite physical/emotional problems likely caused by use of alcohol/drugs Items: E5: Use of alcohol/drug cause you to have emotional or psychological problems; bu continued to use in spite of this [E51] E6: Use of alcohol/drug cause you have physical health problem; but continued to use in spite of this [E51] [yes to either]

A diagnosis of substance abuse requires meeting at least one of the following criteria in the absence of a dependence diagnosis: continued use despite recurrent familial, social, and occupational disorders; recurrent use in physically hazardous situations; recurrent substance-related legal disorders; and recurrent substance use resulting in a failure to fulfill major role obligations. Again, we operationalized the definition of abuse consistent with the method used in Iowa; the specific criteria are listed in Table 10.

Measures of alcohol and drug abuse and dependence were computed separately. Substance abuse was defined as either alcohol or drug abuse. Substance dependence was defined as either drug abuse or dependence.

6. Need for Substance Use Treatment: Need was defined consistent with the measure used in NSDUH and includes persons who either met the criteria for substance abuse or dependence in the past year or who used specialty treatment services in the past year. Specialty treatment is

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[17] Lutz, Gene M., Park, Ki-Hyung, Mayfied, Jamie, and Philipp, Michael. 2004. Iowa 2002 SNAP: State Treatment Needs Assessment Program for Adult Substance Use. Iowa: Center for Social and Behavioral Research, University of Northern Iowa.

defined as any treatment or counseling for alcohol or drug use not including support groups such as Alcoholic Anonymous or Narcotics Anonymous.

7. <u>Mental Health</u>: Two measures of mental health were included: a) a screener for possible depression, and b) a measure of serious mental illness.

   a) Depression Screener

The two-item Patient Health Questionnaire (PHQ-2).[18] depression screener was used (Kroenke et al. 2003). The questions ask respondents how often in the past two weeks they had been "bothered by having very little interest or pleasure in doing things" or "been bothered by feeling down, depressed or hopeless" In the Minnesota survey, the response set was modified to

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Table 10
DSM-IV Criteria: Substance Abuse
(Does not meet Dependence Criteria and at least one of the following criteria associated with recurrent use of drugs/alcohol))

1. Failure to perform role obligations:
Item: E4: Use of substances often kept you from working, going to school, etc. [1+times]]
2. Participation in hazardous activiites
Items:
F1: Accidental injury requiring medical care associated with use of drugs/alcohol [1+times
F5: Drive after drinking/drug use [2+times]
D8: Injected drugs past year [1+times]
3. Legal Problems
Items:
F6: Arrested for driving under the influence of drugs/alcohol [1+times]
F7 & F8: Arrested and booked for drunkenness or other liquor law Violations/or for possession or sale of drugs [2+times]
F9: Arrested and booked for other violations of law associated with use of alcohol/drugs [2+ times]
F10: On probation or parole associated with use of alcohol/drugs [2+ times]
4. Continued use despite social/interpersonal problems
Items:
F4: Friends/family/others complain about use of alcohol/drugs [2+times]
F2: Get into physical fights due to alcohol/drugs [2+ times]
F3: Involved in serious arguments involving alcohol/drugs [2+ times]

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allow 5 possible responses from 'not at all' to 'nearly every day'. To be consistent with the PHQ-2, the categories of 'some days' and 'several days' were collapsed to yield a 4-point response scale, ranging from 0 to 3. Items were summed, and consistent with guidelines, a score of 3 or above was defined as a positive screen.

   b) Serious Mental Illness: The K6 measure of serious mental illness (SMI) was included[19]. The measure has been used in prior studies such as the NSDUH to estimate past-year SMI by asking respondents to recall their feelings during their worst month of the past year. Pre-testing indicated that respondents had difficulty recalling the worst month. At the request of DHS, this measure was changed to ask only about the month prior to interview; therefore, it measure SMI during the past month. The questions ask about how often in the past month (from 'none of the time' to 'all of the time') respondents felt depressed, hopeless, nervous, that every thing was an effort, restless or worthless. In the current survey, the 6-item scale has excellent reliability; Cronbach's alpha exceeds .80. As well, factor analysis indicated that the six items loaded on one factor. Items were recoded to a '0-4' scale, with 4 representing the highest score. Items were

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[18] Kroenke et al. 2003. The Patient Health Questionnaire-2 Validity of a Two-Item Depression Screener. Medical Care, 11: 1284-1292.

[19] Kessler et al. 2003. Screening for Serious Mental Illness in the General Population. Archives of General Psychiatry, 60:184-189.

summed to arrive at a symptom scale ranging from 0-24.   Consistent with guidelines, scores of 13 or above were used to define past-month SMI.

　　　c) Treatment for Mental Health: Treatment for mental health disorders was defined as having "seen a mental health provider, such as a psychiatrist, psychologist, social work, psychiatric nurse or counseled for a emotional or mental health disorder."   Respondents who indicated that they had received such treatment, were asked about recency of use.

8.   Body Mass Index

Body Mass Index (BMI) is defined consistent with standards of the World Health Organization (WHO, 2000)[20]. BMI is defined as weight (kg) / height (m)$^{2.}$ Underweight is defined as BMI < 18.5; Normal weight is 18.5$\leq$ BMI < 25; Overweight is defined as $25 \leq$ BMI < 30, and obesity as BMI $\geq$ 30.

9. Region:

　　Two measures of region of residence were computed.

　　The first classifies the state into seven regions:

　　　　Northeast:(Aitkin, Carlton, Cook, Itasca, Koochiching Lake, Saint Louis)

　　　　East Central: (Benton, Chisago, Isanti, Kanabec, Mille Lacs, Morrison, Pine, Sherburne, Stearns, Wright)

　　　　Metro: (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington)

　　　　Southeast: ((Dodge Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, Winona)

　　　　Southwest: (Big Stone, Blue Earth, Brown, Chippewa, Cottonwood, Faribault, Jackson, Kandiyohi, Lac Qui Parle, Le Sueur , Lincoln, Lyon, Martin, McLeod, Meeker, Murray, Nicollet, Nobles, Pipestone, Redwood, Renville, Rock, Sibley, Swift, Waseca, Watonwan, Yellow Medicine)

　　　　West Central: (Cass, Clay, Crow Wing, Douglas, Grant, Otter Tail, Pope, Stevens, Todd, Traverse, Wadena, Wilkin)

　　　　Northwest: (Becker, Beltrami, Clearwater, Hubbard, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake, Roseau)

A second measure, (metro vs non-metro) was also created: the metropolitan region is classified

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[20] World Health Organization. 2000. Obesity: preventing and managing the global epidemic. In *WHO Technical Report Series, No. 894*. Geneva: World Health Organization.

as outlined above, non-metro includes all other regions.

IX.   Translation of the Instrument

The initial translation was completed in three steps. First, standard questions which have been translated into Spanish by other organizations were used whenever possible. The original STNAP questionnaire was available in Spanish. The mental health questions were also available in Spanish. Second, the Survey Center employed a Spanish translator who translated the remainder of the questions and also reviewed the questions we received from other organizations.   Other Spanish speaking staff also reviewed the translations. The completed translation was sent to a community translator who is a native Spanish speaker who has reviewed and edited Spanish translations for several of previous studies. Third, the community and staff translator met to resolve any differences about proper translation.