ALCOHOL, TOBACCO AND PREGNANCY: THE BELIEFS AND PRACTICES OF MINNESOTA WOMEN

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EXECUTIVE SUMMARY

PURPOSE AND SURVEY SAMPLE

Women of child-bearing age in Minnesota were surveyed regarding their use of alcohol and tobacco, and their beliefs about such use during pregnancy. The survey is part of a statewide effort conducted by the Minnesota Department of Health to prevent fetal alcohol syndrome, fetal alcohol effects, and drug exposed infants in Minnesota. This prevention effort has three components: research, professional education and public awareness. Research strongly suggests that of the drugs that are most damaging to the developing fetus, alcohol and tobacco are the greatest culprits. The statewide survey is intended to provide a current portrait of the beliefs and behavior of 18 to 45 year old women concerning the use of alcohol and tobacco during pregnancy. It is expected that the survey results will be useful in guiding prevention strategies.

A representative sample of 1,017 Minnesota women age 18 to 45 were surveyed by telephone between October 30, 1993 and January 9, 1994. The sample was drawn proportionately by region of the state to insure geographic representativeness. The women surveyed tended to be married (65%), high school graduates (96%), and employed (81%). Most had contact with health care providers, 86 percent having visited a doctor or health care clinic within the past 12 months. Two-thirds of those surveyed had been pregnant at least once in their lives for five or more months.

KEY FINDINGS

1. What are the current alcohol and tobacco use patterns among women of child-bearing age in Minnesota?

Sixty-two percent of the women surveyed were current drinkers (i.e., they drank alcohol in the past 30 days). Most current drinkers were light to moderate drinkers, only 4 percent having drunk 30 or more drinks in the past month. Twenty-two percent of current drinkers reported binge drinking in the past 30 days (i.e., having five or more drinks on an occasion). Binge drinkers and those who drank more heavily tended to be younger (under age 25), never married, less educated (not a high school graduate) and in blue collar occupations.

Sixty-one percent of the women surveyed had tried cigarettes, 45 percent were regular smokers at some time during their lives, and 27 percent were current smokers. Higher rates of current smoking were found among younger women, the previously married, the less educated, and those in blue collar and service industry occupations. Of current smokers, 51 percent reported smoking 10 or fewer cigarettes per day, 39 percent smoked 11 to 20, and 10 percent smoked 21 or more. Current smokers were not more likely to be current drinkers, nor vice versa.

2. Among Minnesota women of child-bearing age, do alcohol and tobacco use patterns change in any way during pregnancy? If so, how?

Survey results indicate that awareness of the dangers of alcohol and tobacco use during pregnancy is widespread among women of child-bearing age. About one-quarter (24%) reported drinking alcohol during their most recent pregnancy and almost all of these women drank lightly, nine in 10 averaging one drink per week or less. Only 1 percent reported binge drinking during pregnancy.

Similarly, slightly less than one-quarter (22%) reported smoking during their most recent pregnancy, and most who did smoke tended to smoke lightly -- over six in 10 reported smoking 10 or fewer cigarettes per day. Only about 1 percent of the women surveyed reported smoking more than a pack of cigarettes per day during pregnancy. We should caution, however, that alcohol and tobacco use are self-reported and may be subject to underreporting.

High proportions of women who were drinking and smoking prior to pregnancy reported reducing or stopping while pregnant. Ninety-three percent of those who were drinking prior to their most recent pregnancy reported reducing or stopping during the pregnancy. Eighty percent of smokers reported reducing or stopping during their most recent pregnancy. Those who smoked during pregnancy tended to be younger (especially 18 to 20), to be currently unmarried, to have less education (especially those who had not completed high school), and to have blue collar or service industry jobs. Many women reduced or stopped their alcohol or tobacco use during pregnancy without being advised by their doctors to do so. Nevertheless, those who were specifically advised by their doctors not to use alcohol or tobacco while pregnant were more likely to stop their use of these substances.

3. What do Minnesota women of child-bearing age know and believe about alcohol/tobacco use during pregnancy?

Most of the women surveyed believed that daily drinking, binge drinking, and daily cigarette smoking during pregnancy were extremely likely to cause harm to the newborn. About one-third felt that occasional drinking or occasional smoking during pregnancy were extremely likely to cause such harm.

Most women correctly believed that harm to the newborn would be the same regardless of whether a pregnant woman drank beer, wine or alcohol. However, 61 percent wrongly believed that crack/cocaine use during pregnancy is causing harm to the largest number of newborns in the United States. Alcohol and tobacco, in fact, cause harm to larger numbers of newborns.

4. What is the social climate or social norms regarding alcohol use during pregnancy in Minnesota?

Most of the women surveyed said that the people close to them (parents, spouse, family and friends) would be concerned if they drank during pregnancy. Furthermore, seven in 10 women reported that almost none of the women they knew drank alcohol during pregnancy. However, those who knew more women who drank during pregnancy, or who had people close to them who were less concerned about drinking during pregnancy, were more likely to drink themselves while pregnant.

Women differed somewhat in their opinions about the degree to which people should discourage or prohibit pregnant women from drinking. Nearly two-thirds agreed that neither friends nor bartenders should serve alcoholic drinks to pregnant women. Most women agreed that they should warn a pregnant friend drinking at a bar not to drink, but only one-third said that they should so warn a pregnant stranger.

IMPLICATIONS OF THE SURVEY RESULTS

Despite widespread awareness of the risks, survey findings suggest a number of areas of concern regarding alcohol and tobacco use during pregnancy among Minnesota women. These concerns or issues have implications for professional education, public information strategies, prevention programs and future research.

Professional Education

The advice or counsel of the doctor appears to make a difference in reducing or stopping alcohol and tobacco use during pregnancy. Yet many women are still not advised to reduce or stop by their doctors or health care providers. Since almost all of the women surveyed were in regular contact with health care providers, the health care system is a potentially effective means of disseminating information or warnings on this issue. Health care professionals should also be made aware of higher risk groups for alcohol/tobacco use during pregnancy (e.g., younger women, the less educated) so that they can make special efforts to reach these groups.

Public Information Strategies

Public information campaigns may want to concentrate on delivering more specific messages about alcohol/tobacco use during pregnancy to a public that is already quite knowledgeable about the general issue. Specific messages suggested by the survey findings are as follows:

- Drinking early in pregnancy can be harmful to the fetus. It could be beneficial (especially for heavier drinkers and binge drinkers) to stop drinking when planning or trying to become pregnant.

- Heavy drinking and heavy smoking during pregnancy cause harm to more newborns than cocaine use, although cocaine use is clearly dangerous too.
- Binge drinking can be especially dangerous while pregnant.

Prevention Programs

Programs to prevent alcohol/tobacco use during pregnancy need to begin early because drinking and smoking are common among teens. Prevention efforts might seek to discourage advertisers of alcohol and tobacco products from targeting young women and/or seek to counter the messages of such advertising. A priority for prevention programs should be high school dropouts. This group of women was found to be a high-risk group for both smoking and drinking during pregnancy.

Future Research

Further research is needed on high-risk groups for alcohol/tobacco use during pregnancy (e.g., teens, high school dropouts). We need to have a better understanding of how to reach these groups and what prevention approaches are likely to be most effective with them. More study of alcohol/tobacco use patterns during pregnancy in racial/ethnic minority groups may also be helpful to prevention efforts. The current study was unable to address this potentially important area.

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CHAPTER I: INTRODUCTION TO THE SURVEY

Women of child-bearing age in Minnesota were surveyed regarding their use of alcohol and tobacco, and their beliefs about such use during pregnancy. The survey is part of a statewide effort conducted by the Minnesota Department of Health to prevent fetal alcohol syndrome (FAS), fetal alcohol effects (FAE), and drug exposed infants in Minnesota. This prevention effort has three components: research, professional education and public awareness.

BACKGROUND

Ranked with Down's Syndrome and spina bifida as the most common known causes of mental retardation, in utero exposure to alcohol is the most prevalent cause of preventable mental retardation. The tragedy is that FAS and FAE are permanent and irreversible. There are no cures and no effective methods of treatment. The hope lies in the fact that FAS/FAE are totally preventable. This is also true for drug-exposed infants.

The Fetal Alcohol Syndrome, Fetal Alcohol Effects and Drug-Exposed Infants Prevention Program at the Minnesota Department of Health is funded by the State Legislature. The purpose of the program is to prevent FAS and FAE and to reduce the number of drug-exposed infants in Minnesota. The program has three emphases: research, professional education and public awareness. The statewide survey of women of child-bearing age is one of the research projects to be funded with the current appropriation. A fuller description of the program is provided in Appendix A.

The survey was identified as a priority research project for the program through a six-month planning process. The planning process included input from the Healthy Roots Coalition, the Maternal/Child Substance Abuse Council and the Minnesota Department of Health FAS Work Group. Members of these groups include health, social services and educational professionals as well as adoptive parents of FAE children.

Research strongly suggests that of the drugs that are most damaging to the developing fetus, alcohol and tobacco are the greatest culprits. Though the use of all drugs is of concern, often their use occurs in tandem with that of alcohol and/or tobacco. The primary focus of the survey is on the use of alcohol among women of childbearing age in Minnesota. A secondary focus is on their use of tobacco.

The tragedy of fetal alcohol syndrome has received growing attention in the past few years. Nevertheless, we know very little about how women of childbearing age in Minnesota use alcohol and tobacco, what they know about FAS/FAE, nor do we have a clear idea of their knowledge and beliefs about the use of alcohol and tobacco during pregnancy, or where they get their information about drinking during pregnancy. In addition, our social climate encourages the use of alcohol and

often works against making healthy decisions to not use alcohol in a given situation or for a given reason.

The FAS, FAE and Drug-Exposed Infant Prevention Program operates under the assumption that women want to do their best to have a healthy baby. Lack of knowledge or faulty information about the hazards of substance use during pregnancy, a non-supportive social environment, or tobacco/alcohol dependency are barriers that may keep some women from engaging in healthy practices during pregnancy. The survey is intended to provide a current portrait of the knowledge, beliefs and behavior of 18 to 45 year old women concerning the use of alcohol and tobacco during pregnancy. It is expected that the survey's findings will be useful in guiding prevention efforts on this issue.

SURVEY QUESTIONS

The survey was designed to address the following questions:

1. What are the current alcohol and tobacco use patterns among women of child-bearing age in Minnesota?
2. Do these patterns change in any way during pregnancy? If so, how?
3. What do Minnesota women of child-bearing age know and believe about alcohol/tobacco use during pregnancy?
4. What is the social climate or the social norms regarding alcohol use during pregnancy in Minnesota?

SURVEY METHODS

Survey Sample

The sample for the survey was designed with the aim of obtaining a representative sample of Minnesota women of child-bearing age living in households with telephones. A random digit sample of telephone numbers across the state was drawn. The sample was drawn proportionately by region of the state to insure geographic representativeness of the sample. One woman age 18 to 45 was surveyed in each selected household where one or more 18 to 45 year old women resided. Younger females (13 to 17 year olds) were excluded because information about their alcohol and tobacco use was already available from other studies (i.e., Minnesota Student Survey, Minnesota Department of Education, 1989-1992). Furthermore, obtaining parental consent to survey minors would have been difficult in a telephone survey.

Telephone survey interviews were successfully completed with 1,017 women. The interviews were conducted between October 30, 1993 and January 9, 1994. Eighty percent of those selected for the survey sample completed the interview.

Survey Instrument

The survey instrument is a structured telephone interview designed to gather information about alcohol and tobacco use by women of child-bearing age, and knowledge, beliefs and social norms regarding such use during pregnancy. (The survey instrument is included in Appendix B.) The instrument includes questions drawn from previous surveys as well as newly created questions. Questions about the use of alcohol and tobacco during pregnancy focus upon the most recent pregnancy that lasted five or more months. It was decided to focus on pregnancies of this length because it is likely that after five months the woman intends to carry the pregnancy to full term. This intention may affect the behaviors in which the woman engages related to trying to have a healthy newborn.

The survey instrument was field tested prior to being finalized. Interviewers were thoroughly trained in the study procedures and in the administration of the survey instrument. Quality control techniques were used to ensure that the interviews were done accurately and completely. See Appendix C for a detailed description of the sampling design and survey methods.

Limitations of the Survey

Figures derived from the survey are subject to sampling error. With a sample size of slightly over one thousand (i.e., 1,017), sampling error is estimated at plus or minus 3 percent. That is, we can be 95 percent confident that the true figure in the population is within 3 percent above or below the figure obtained from the sample. For example, survey results indicated that 27 percent of women age 18 to 45 smoked cigarettes in the past month. We can be 95 percent confident that the true figure is between 24 and 30 percent. Sampling error will generally be larger for figures derived from subgroups of the sample (e.g., women age 18 to 24, those who didn't complete high school, women who used alcohol during pregnancy). Hence, caution is advised in drawing conclusions based on figures from such subgroups.

In addition to sampling error, a couple of other notes of caution about the accuracy of survey results should be mentioned. First, despite anonymity and confidentiality of respondents' answers, underreporting of alcohol consumption may occur in surveys of this type because of the social undesirability of particular responses. Reporting of alcohol use during pregnancy may be especially influenced by this social desirability factor, and consequently, may not always be accurate. The degree to which underreporting occurred, if it occurred at all, cannot be estimated. Second, some of the survey questions ask respondents to recall behavior or events that occurred

five, ten or more years ago. Recall over such lengthy periods of time may be prone to inaccuracies.

Comparisons to the 1990 Census suggest that the sample is quite representative of Minnesota women of child-bearing age, except that younger women appear to be slightly underrepresented. This apparent underrepresentation should be kept in mind as it may affect some of the figures obtained from the survey that are age-related (for example, current rates of binge drinking among women of child-bearing age).

Finally, it is important to remember that because this is a household-based telephone survey, women of child-bearing age living in households and other places (e.g., institutions, homeless shelters) without telephones are excluded from the survey. Very few households in Minnesota are without telephones, however. According to the 1990 Census, 98 percent of the households in Minnesota have telephones.

ORGANIZATION OF THE REPORT

The report is organized into nine chapters. This first chapter is an introductory chapter that has provided a brief overview of the purpose, background and methods of the survey. Chapter II offers a demographic portrait of the women surveyed. It also briefly describes their access and use of health care. Chapter III describes current drinking patterns among women of child-bearing age with some information on past use of alcohol, including age when they first drank alcohol. Chapter IV describes current patterns of cigarette smoking among women of child-bearing age and lifetime prevalence of smoking. Drinking patterns during most recent pregnancy are described in Chapter V among the women who have ever been pregnant for five or more months (two-thirds of the sample). Results are presented concerning the number and characteristics of women who drank while pregnant, the amount they drank, the changes that occurred in drinking due to pregnancy, and the nature/frequency of doctors' advice about drinking during pregnancy and its effect. Results regarding cigarette smoking during most recent pregnancy are presented in Chapter VI. This includes number and characteristics of women who smoked during pregnancy, number of cigarettes smoked, changes in smoking due to pregnancy, and doctor's advice and its effect. Chapter VII describes women's beliefs about the harm caused to newborns by use of alcohol, tobacco and cocaine during pregnancy. Chapter VIII presents results regarding the behavior and beliefs about drinking during pregnancy of other people whom the women surveyed knew, and results concerning the social norms surrounding drinking during pregnancy. The final chapter, Chapter IX, offers general conclusions drawn from the survey, and presents implications of survey results for professional education, public information strategies, prevention programs, and future research.

CHAPTER II: DEMOGRAPHIC PROFILE AND HEALTH CARE UTILIZATION

DEMOGRAPHIC CHARACTERISTICS

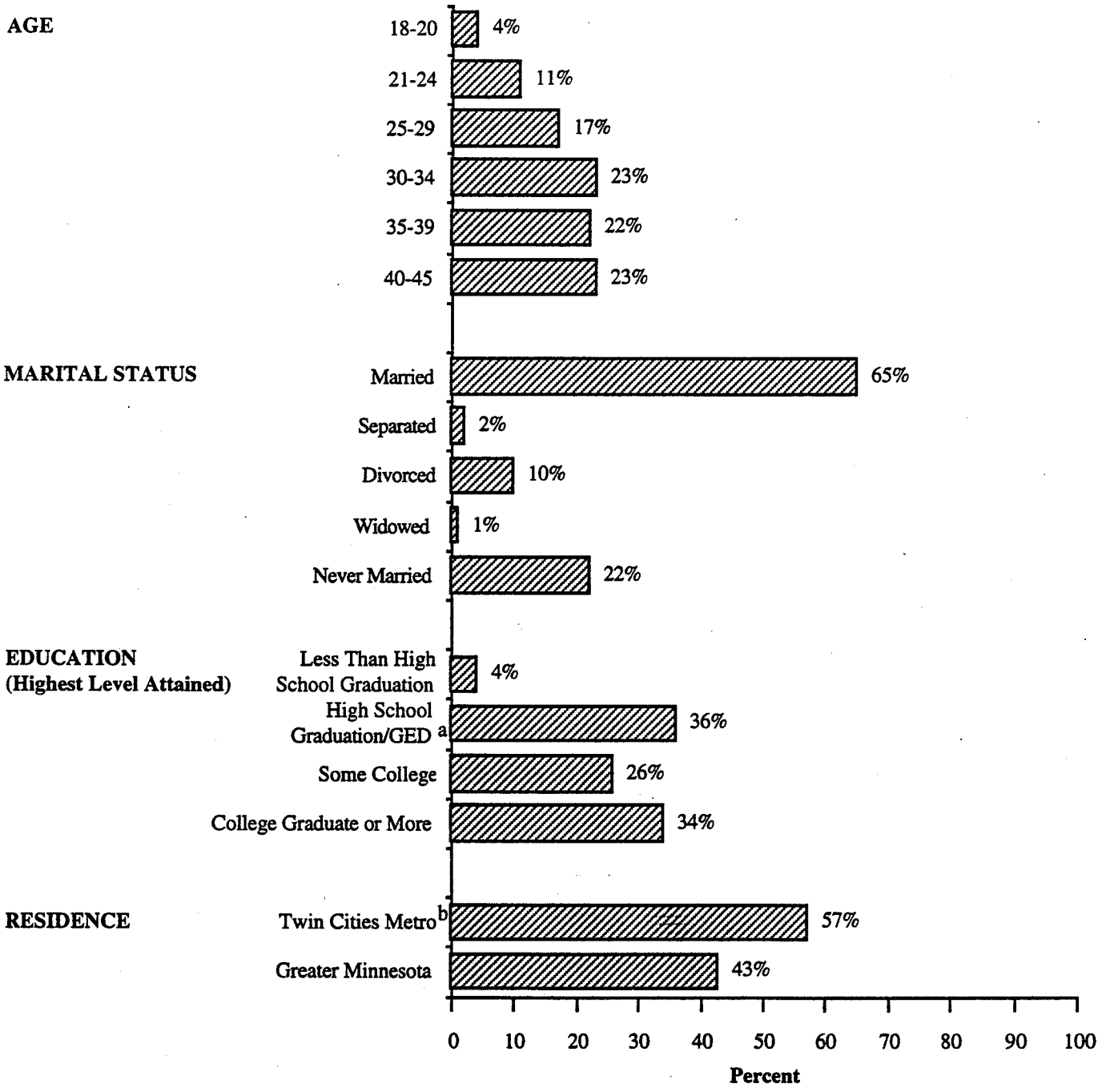
Figure 2.1 provides a demographic profile of the women surveyed. Women included in the survey had to be of child-bearing age. This was defined as between 18 and 45 years old. There were more women at the older end of this age range than at the younger end. The average (mean) age of the women surveyed was 33. Over two-thirds of the women surveyed (68%) were age 30 and older, including 23 percent who were age 40 to 45. Only 4 percent of the women surveyed were under age 21. The higher numbers of women at older ages reflects the post World War II "baby boom" phenomenon. Women age 30 and older in the survey were born during the baby boom period (i.e., 1946 to 1964).

Most women (65%) were married, 22 percent had never married, and 13 percent were previously married -- 10 percent divorced, 2 percent separated and 1 percent widowed.

Only 4 percent of the women surveyed did not have a high school diploma or equivalency degree. Sixty percent of the women had attended college, including 34 percent who were college graduates. Eight percent had post-graduate degrees. As a whole, the women surveyed had relatively high education levels compared to women nationally. This probably is due to the age group surveyed (predominantly baby boom generation) and the comparatively high education levels found in Minnesota.

Finally, Figure 2.1 shows that over half the women surveyed (57%) lived in the Twin Cities Metropolitan Area, while 43 percent lived in areas of the state outside the Metro Area (i.e., greater Minnesota).

FIGURE 2.1
Demographic Profile of the Women Surveyed (N=1,017)

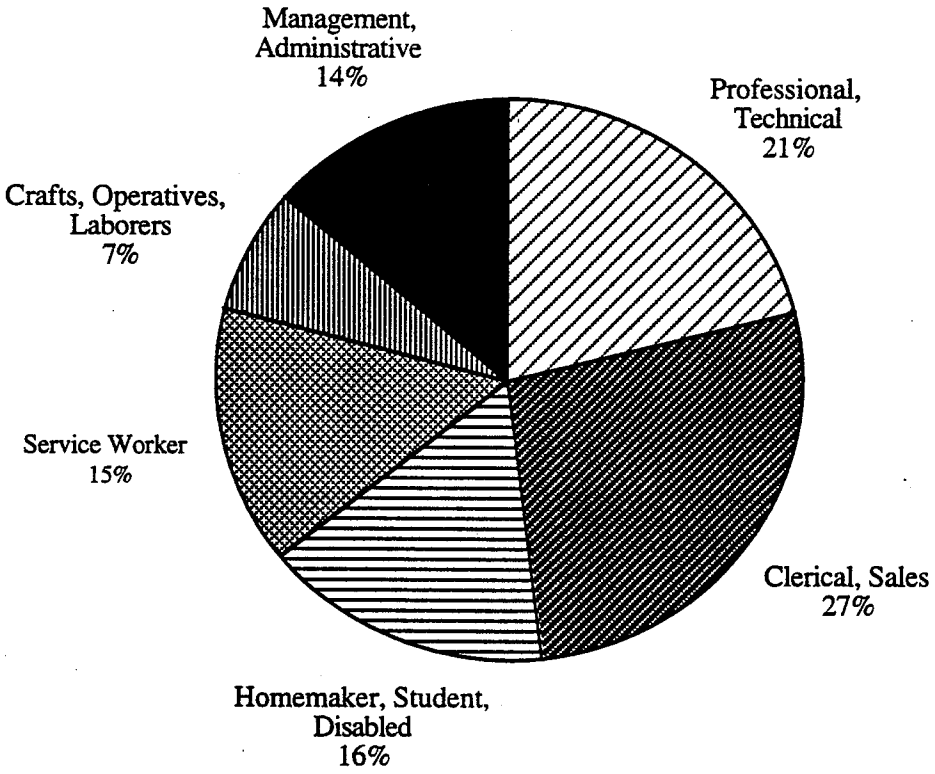


a Includes women who attended vocational or business school after high school.

b Seven-county metropolitan area.

Eighty-one percent of the women were currently employed. This included 57 percent who were working full time, 22 percent who were working part time, and 2 percent who were in temporary or seasonal positions. Of the remaining 19 percent, 3 percent said they were not currently employed, 11 percent were homemakers, 4 percent were students, and 1 percent were disabled. The major occupational categories into which the women's current or most recent jobs fell are shown in Figure 2.2. Fourteen percent had managerial or administrative occupations, 21 percent had professional or technical occupations, 27 percent had clerical and sales occupations, 15 percent were service workers and 7 percent had traditional blue collar occupations (crafts/trades, operatives, laborers). The most frequently mentioned specific occupations were secretaries, food service workers (e.g., cooks, waitresses), health technologists/technicians, registered nurses, elementary and secondary school teachers, and bookkeepers.

FIGURE 2.2
Occupation (Current or Most Recent) of Women Surveyed (N=1,015)

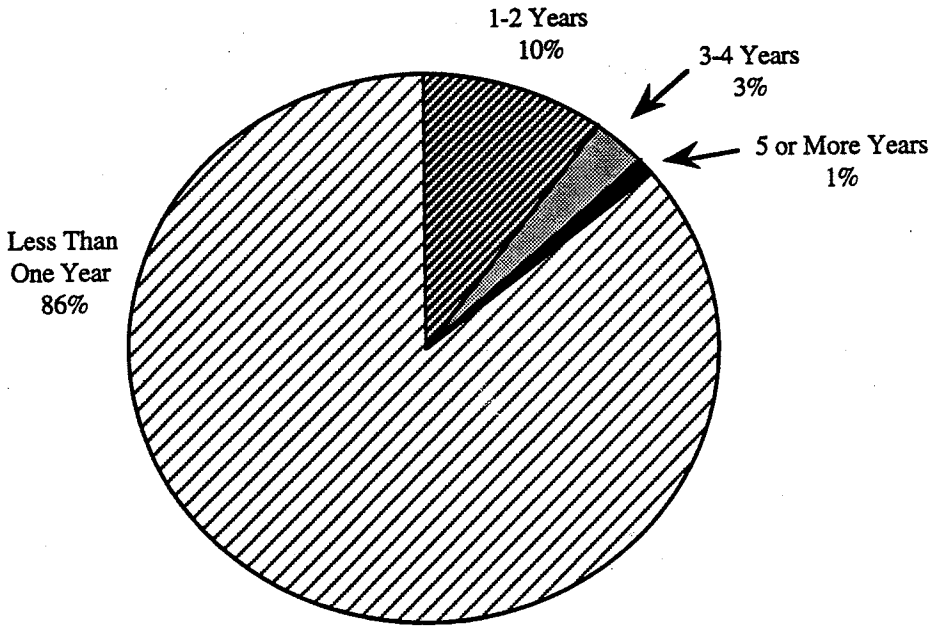


HEALTH CARE UTILIZATION

Ninety-one percent of the women surveyed said they had health care insurance for themselves. Among these women, 81 percent had private health insurance (including HMO coverage), 8 percent had Medical Assistance, and 2 percent had Minnesota Care. Thirteen percent of all the survey respondents said that there was a time within the last year when they needed to see a doctor but couldn't due to the cost. Not surprisingly, those most likely to say this were women who lacked health insurance.

Eighty-six percent of the women had visited a doctor or health care clinic within the past year, and 96 percent had done so within the past two years (see Figure 2.3). Almost all (98%) of the women surveyed had had a Pap smear (a test for cancer of the cervix). Sixty-two percent had this test within the last year, 26 percent had it one to two years ago, 7 percent had it three to four years ago, and 3 percent had it five or more years ago. The Pap smear is a preventive medical visit and is a potential opportunity for preventive education on the risks of alcohol and tobacco use during pregnancy.

FIGURE 2.3
Length of Time Since Last Visit to a Doctor or Health Care Clinic (N=1,016)



SUMMARY

Demographic Characteristics

- Among the women surveyed of child-bearing age (ages 18 to 45), 68 percent were age 30 or older. The higher number of women at older ages within the child-bearing age range reflects the post World War II "baby boom" phenomenon.
- Most of the women surveyed were married (65%).
- Educational attainment levels were quite high -- 34 percent of the women were college graduates and only 4 percent had not completed high school.
- A high proportion of women were currently employed (81%) including 57 percent who were employed full time.

Health Care Utilization

- Nine percent of the women surveyed had no health care insurance.
- Ninety-six percent had visited a doctor or health care clinic within the past two years, and 86 percent had done so within the last year.
- Eighty-seven percent reported having a Pap smear within the past two years, and 62 percent reported having one within the last year.

CHAPTER III: DRINKING PATTERNS AMONG WOMEN OF CHILD-BEARING AGE

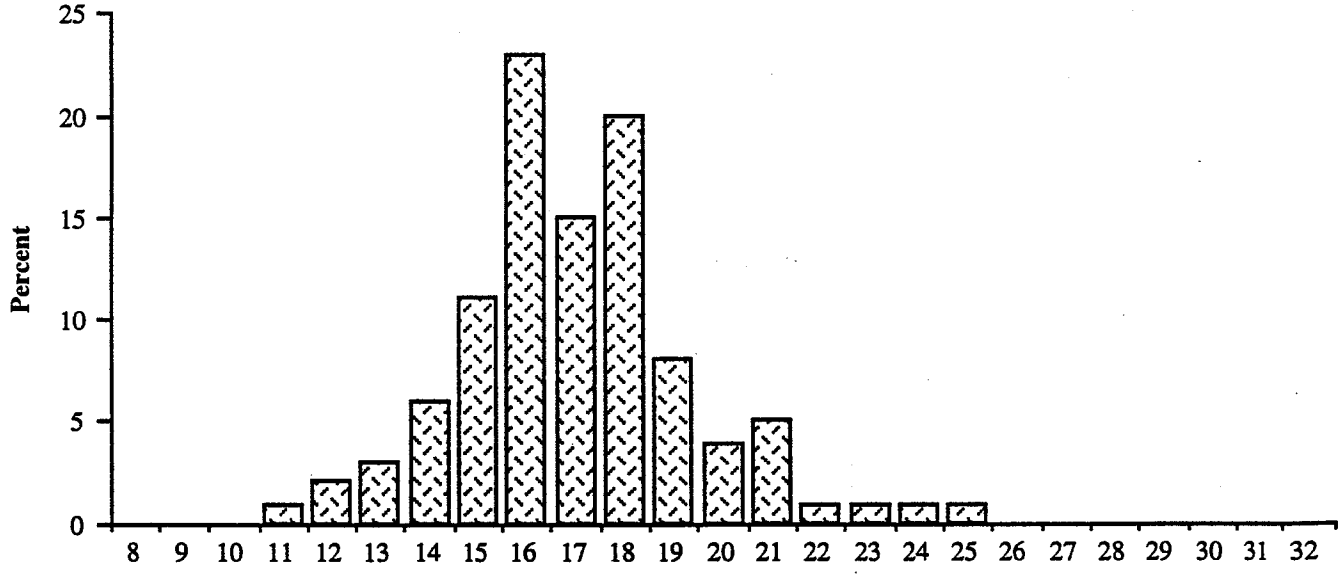
AGE FIRST DRANK ALCOHOL

Figure 3.1 shows the age at which women reported having their first drink of alcohol. (This didn't include sips given to them as a child nor alcohol used during religious services.) The average age at which women had their first drink was 17. Over two-thirds of the women had their first drink between the ages of 15 and 18. Only 3 percent reported never having a drink of alcohol.

The age at which women have their first drink of alcohol may be declining. Table 3.1 shows that younger survey respondents reported having their first drink at earlier ages than older respondents. Those respondents who were currently age 24 or younger had their first drink at 16, on the average, compared to an average of almost 18 for those currently age 35 or older.

Throughout this report when differences are cited between or among groups, these differences are statistically significant at the .05 level.

FIGURE 3.1
Age When Had First Drink of Alcohol[a] (N=972[b])



Mean = 17.1 years, standard deviation = 2.5, range: 8 to 32 years

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a This does not include sips given while a child nor alcohol used during religious services.

b There were 35 women (3%) who reported that they had never drunk alcohol, 5 didn't know when they had their first drink and 5 refused to answer the question.

TABLE 3.1
Age at Which Women Had Their First Alcoholic Drink by Current Age

Current Age	N	Age Had First Alcoholic Drink Mean
18 - 24	149	16.2
25 - 34	386	16.6
35 - 45	434	17.8
Total	969	17.1

F (2,966) = 35.89, p< .001

CURRENT DRINKING

Sixty-two percent of the women surveyed reported drinking an alcoholic beverage in the past 30 days (see Figure 3.2). Among women who did not have a drink within the past 30 days, 17 percent had their most recent drink one to six months ago, 6 percent had it six to 12 months ago, 5 percent had it one to three years ago, and 7 percent had their most recent drink three or more years ago. The proportion of women surveyed who drank in the past 30 days is somewhat higher than national figures for women in this age range (Preliminary Estimates from the 1992 National Household Survey on Drug Abuse, U.S. Department of Health and Human Services, Public Health Service, June, 1993).

The proportions of women who drank alcohol in the past 30 days differed by demographic characteristics, as shown in column A of Table 3.2. Higher percentages of women in the following categories reported drinking in the past 30 days: never married, educational attainment level of some college or more, higher-level white collar occupation (professional/technical or managerial/administrative), and residing in the Twin Cities Metro Area.

FIGURE 3.2
Most Recent Time Had Alcoholic Drink (N=1,017)

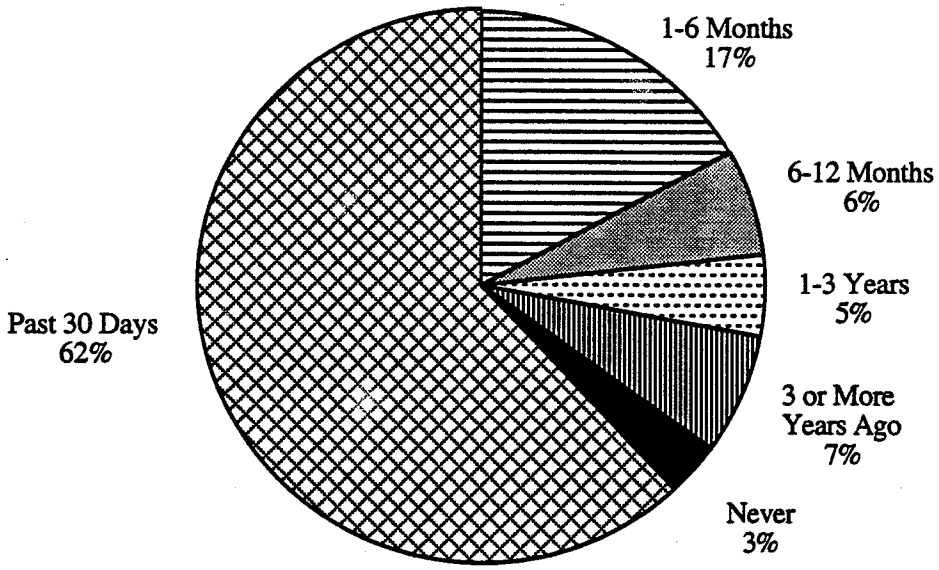


TABLE 3.2
Demographic Characteristics and Current Drinking

Characteristic		Only Respondents Who Drank in Past 30 Days A. Drank in past 30 days (N=1017)		B. Mean number of drinks in past 30 days (N=624)		C. Drank 5+ drinks on an occasion in the past 30 days (N=626)	
TOTAL		62%		8.5		22%	
Age	18 - 20	59%		12.8		42%	
	21 - 24	65%		11.1		43%	
	25 - 34	62%		8.0	**	25%	***
	35 - 45	62%		7.9		12%	
Marital Status	Married	60%		7.1		17%	
	Previously married	57%	*	8.8	***	20%	***
	Never married	70%		12.1		37%	
Education	Less than high school graduation	51%		16.1		50%	
	High school graduation/GED	55%	***	7.9	**	25%	**
	Some college or more	67%		8.4		19%	
Occupation	Professional/technical	71%		7.1		14%	
	Managerial/administrative	68%		8.6		18%	
	Clerical/sales	62%		8.5		26%	
	Crafts/operatives/laborers	54%	**	12.6	*	47%	***
	Service workers	56%		10.5		26%	
	Homemaker/student/disabled	54%		7.6		17%	
Residence	Twin Cities Metro	67%		8.8		21%	
	Greater Minnesota	56%	**	8.1		24%	

* $p < .05$

** $p < .01$

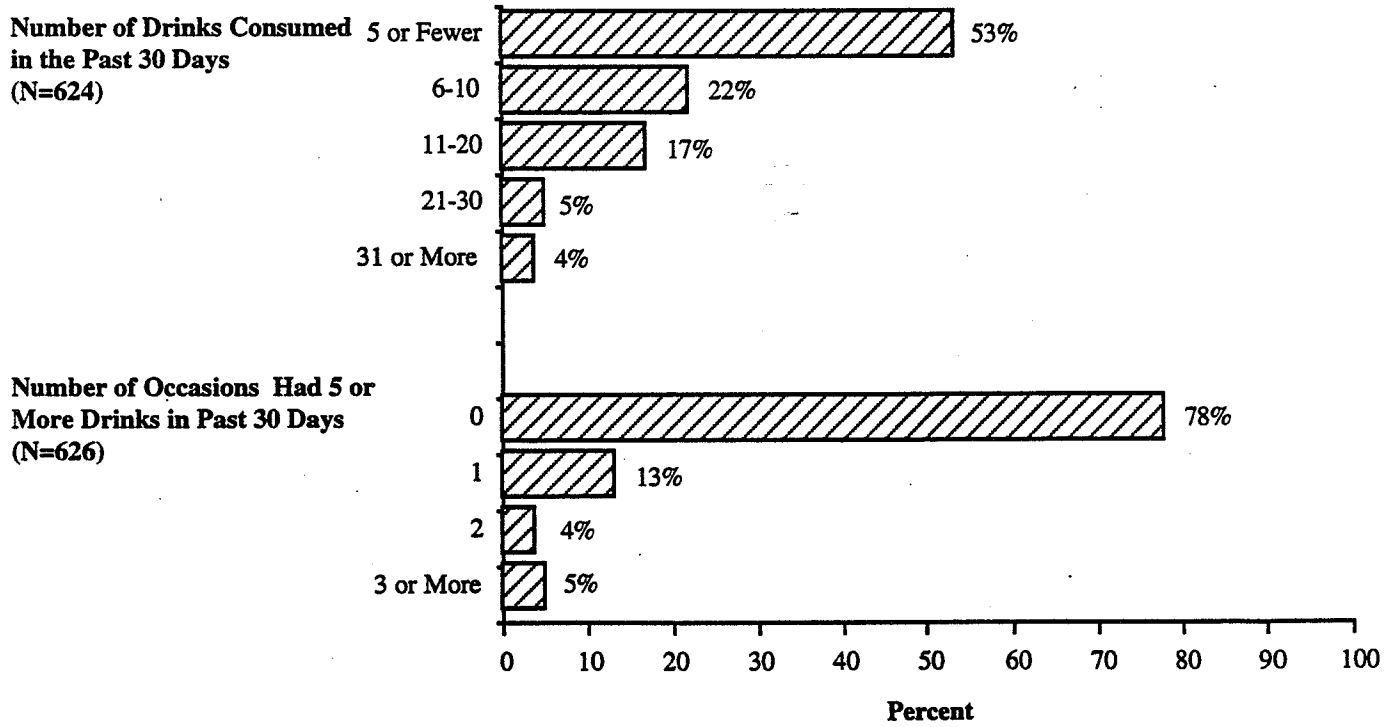
*** $p < .001$

DRINKING PATTERNS AMONG CURRENT DRINKERS

Figure 3.3 indicates the number of drinks women reported consuming in the past 30 days and the number of occasions on which they had five or more drinks during the same period. Only women who reported drinking in the past 30 days are included in the figure. Three-quarters of the women reported having 10 or fewer drinks in the past 30 days, and only 4 percent reporting having more than 30 drinks during this period.

Most of the women who drank in the past 30 days did not have five or more drinks on any occasion during that time. However, 22 percent had five or more drinks on at least one occasion in the past 30 days, including 9 percent who had done so on two or more occasions. Having five or more drinks on an occasion is considered binge drinking for purposes of this survey. The time of the year that the survey was done (i.e., during the "holiday season" months of November and December) may have resulted in a higher rate of binge drinking being found than if the survey had been had done at another time of year. The comments of several respondents suggested that although they had done binge drinking at a holiday party in the past month, this was not their usual pattern.

FIGURE 3.3
Current Drinking Patterns Among Women Who Drank in the Past 30 Days



We tested to see whether women who consumed more drinks in the past 30 days, or did binge drinking, differed demographically from other women who drank during the past 30 days (see Table 3.2, columns B and C). Results showed a similar pattern for women who consumed more drinks and women who did binge drinking. First, women who drank more or binge drank were younger. The point of differentiation seemed to be greatest between those 24 and younger and those 25 and older. For example, over four in 10 women under age 25, who drank in the past 30 days, reported binge drinking.

Never married women tended to consume more drinks and to be more likely to binge drink than married or previously married women. This finding seems consistent with the finding that younger women consume more drinks/binge drink, since never married women tend to be younger.

Consuming more drinks in the past 30 days and binge drinking were also more likely among women who had not completed high school and among women who worked in traditional blue collar occupations (e.g., crafts or trades, operatives, or laborers). About half the women in these categories reported binge drinking in the past 30 days.

It is interesting to note that college educated women, and women in higher-level white collar jobs were more likely to drink (at least one drink) in the past 30 days. Yet among women who drank in the past 30 days, it was the less educated and blue collar workers who drank more or did binge drinking.

REDUCTIONS IN DRINKING

Fifty-eight percent of the women who had ever drunk alcohol said that there was a time in the past when they drank more than they currently do. Most (67%) said that the time in the past that they had drunk more was five or more years ago. The age group that was most likely to be drinking less now than in the past was 25 to 34 year olds (64 percent reported a reduction), and 18 to 20 year olds were least likely to report a reduction (40 percent reported a reduction).

We asked those who had reported a reduction in drinking whether there was any special circumstance or event that caused them to make this reduction. Fifty-eight percent said "yes" there was a special circumstance or event. Table 3.3 indicates the circumstances/events, and their frequency, that respondents said caused them to reduce their alcohol intake. The leading reason was "maturity/grew up/out of college/more responsibilities," followed by "pregnancy/trying to become pregnant."

Four percent (n=38) of the women surveyed reported that they had been treated in an alcohol or drug treatment program. Previously married women and those who had not completed high school were more likely to have been in such a program. Also, those who had been through an alcohol/drug treatment program were much less likely to be current drinkers compared to other women who had drunk sometime during their lives (24% vs. 66%).

TABLE 3.3
Reasons Women Reduced Their Alcohol Intake at Some Time in the Past[a]

Maturity, grew up, out of college, more responsibilities	29%
Pregnancy, trying to become pregnant	26%
Health concerns	7%
Family, spending time with children	5%
Concerns about others (alcoholic friends or relatives)	4%
Went through treatment	4%
Lost desire to drink, didn't like it	4%
Marriage	4%

[a] Includes only women who said they drank more in the past than they do now and who said there was a special circumstance or event that caused them to reduce their alcohol intake (n=332).

NOTE: Other reasons mentioned by 2 percent or less were: concerns about own drinking, religious reasons, new driving laws (e.g., DWI laws), job change or working hours change, car accident, trying to lose weight, affected job performance, divorce or separation, death of friend or relative, started or changed schools, ended abusive relationship, to reduce stress, lack of tolerance for alcohol, financial reasons, legal reasons, no time, job regulations, got raped while drunk, designated driver, and moved.

SUMMARY

Age First Drank Alcohol

- The average age that women had their first drink of alcohol was 17. However, the age women begin drinking may be declining. On the average, younger women in the survey (under age 25) reported having their first drink at age 16.

Current Drinking

- Sixty-two percent of the women surveyed reported drinking in the past 30 days.

- Women who were never married, were college educated, held higher-level white collar jobs and lived in the Twin Cities Metro Area were more likely to report drinking in the past 30 days.

Drinking Patterns Among Current Drinkers

- Among current women drinkers, three-quarters reported drinking 10 or fewer drinks in the past 30 days, while 4 percent reported drinking more than 30 drinks during this period.

- Of current women drinkers, 22 percent reported binge drinking (5+ drinks) on at least one occasion in the past 30 days, including 9 percent who did this two or more times during this period. The rate of binge drinking found in the survey may be somewhat elevated because of the time of year the survey was conducted -- i.e., during the holiday season.

- Among current drinkers, women who consumed more drinks or binge drank in the past 30 days had similar demographic characteristics. They tended to be younger (under 25), never married, less educated (not a high school graduate) and in blue collar occupations.

Reductions in Drinking

- Fifty-eight percent of women who had ever drunk alcohol said there was a time in the past during which they drank more than they do now. Many of these women said that there was a special circumstance or event that caused them to reduce their drinking. "Growing up/more responsibility" and "pregnancy" were the leading reasons cited for reducing drinking.

- Four percent of the women surveyed had been in an alcohol or drug treatment program. Only 24 percent of these women were current drinkers.

CHAPTER IV: CIGARETTE SMOKING AMONG WOMEN OF CHILD-BEARING AGE

LIFETIME AND CURRENT SMOKING PREVALENCE

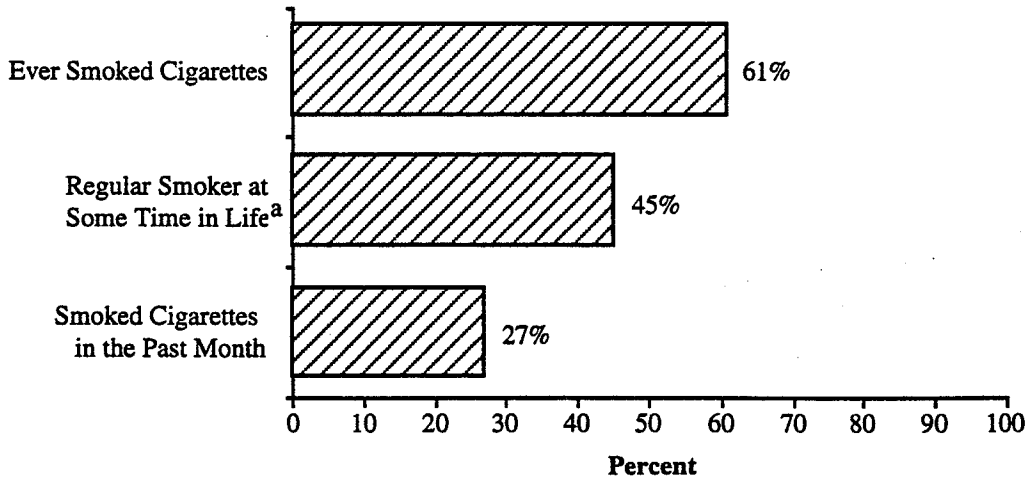
Sixty-one percent of the women surveyed reported that they had smoked cigarettes at some time in their lives. However, a smaller proportion (45%) reported smoking 100 or more cigarettes in their lives. One hundred cigarettes is considered to be the threshold between experimentation and significant use (i.e., being a regular smoker at some time during one's life). Finally, 27 percent reported smoking cigarettes in the past month (see Figure 4.1).

The demographic characteristics of those who smoked cigarettes in the past month (i.e., current smokers) are examined in Table 4.1, column A. The current prevalence of smoking declined with age. Among women 18 to 20, 41 percent were current smokers compared to 23 percent among women age 35 and older. Compared to national figures, it appears that a higher proportion of women under 25 are smokers in Minnesota and a lower percentage of those 25 and older are smokers (Preliminary Estimates from the 1992 National Household Survey on Drug Abuse, U. S. Department of Health and Human Services, Public Health Service, June, 1993).

Half of previously married women were current smokers compared to one-third of never married women and one-fifth of married women.

Current smoking rates decreased as education levels increased. Rates were highest among those who had not completed high school (51%) and lowest among those who had attended college (21%). Occupations with the highest percentages of current smokers were blue collar and service industry occupations. Professional and technical workers had the lowest percentages of current smokers. The occupation and education data seem consistent with each other since occupations requiring higher levels of education had lower rates of smoking.

FIGURE 4.1
Cigarette Smoking Among the Women Surveyed (N=1,017)



[a] Smoked 100 or more cigarettes in lifetime.

TABLE 4.1
Demographic Characteristics and Current Smoking

Characteristic		A. Smoked cigarettes in past month (N=1017)		B. Only those who smoked in past month: Mean number of cigarettes smoked per day (N=274)	
TOTAL		27%		13.0	
Age	18 - 20	41%		8.2	
	21 - 24	36%		10.6	
	25 - 34	27%	**	13.8	*
	35 - 45	23%		13.9	
Marital Status	Married	20%		12.9	
	Previously married	50%	***	15.7	**
	Never married	33%		10.7	
Education	Less than high school graduation	51%		16.5	
	High school graduation/ GED	34%	***	14.3	**
	Some college or more	21%		11.2	
Occupation	Professional/technical	15%		10.2	
	Managerial/administrative	26%		13.9	
	Clerical/sales	27%		10.3	
	Crafts/operatives/laborers	37%	***	15.6	**
	Service workers	35%		13.7	
	Homemaker/student/disabled	32%		16.4	
Residence	Twin Cities Metro	27%		11.3	
	Greater Minnesota	27%		15.4	***

* $p < .05$

** $p < .01$

*** $p < .001$

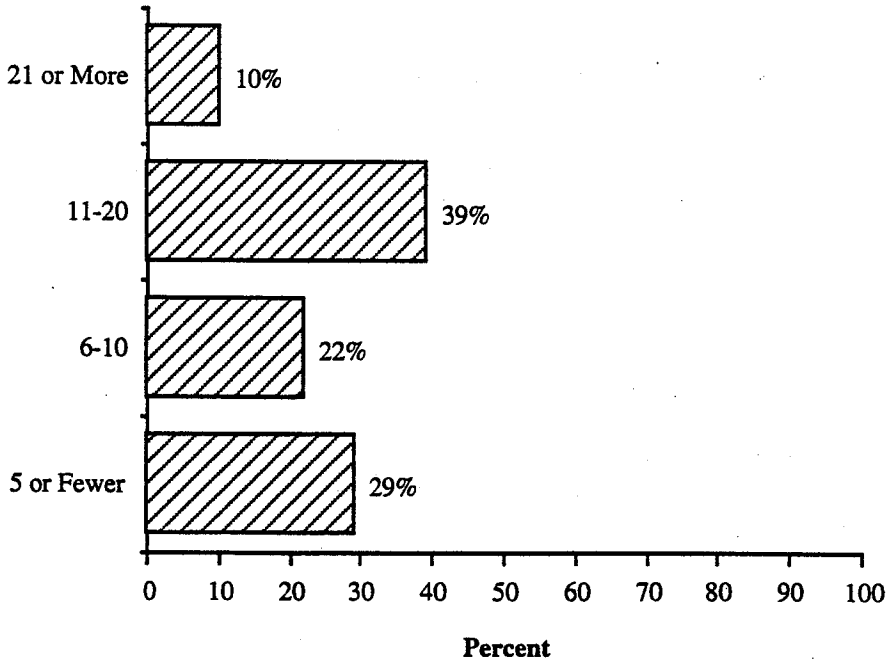
SMOKING PATTERNS

Women who smoked cigarettes during the past month were asked how many cigarettes they smoked per day, on the average. Fifty-one percent reported smoking 10 or fewer cigarettes per day, 39 percent smoked 11 to 20, and 10 percent smoked 21 or more (see Figure 4.2). Table 4.1, column B, indicates the number of cigarettes smoked per day (among those who smoked in the past month) by demographic characteristics. Heavier smokers tended to be older (age 25 or older), previously married, less educated and live in greater Minnesota. Women in blue collar occupations or who were in the "homemakers, students or disabled" category tended to be heavier smokers.

Results from Table 4.1 indicate that the less educated (especially those who have not completed high school) and the previously married are two groups of women with higher rates of cigarette smoking. Women in these groups were both more likely to smoke (about half were current smokers), and if they smoked, to smoke more heavily. With regard to age, however, the pattern was not consistent. Younger women were more likely to be current smokers but older women who were smokers tend to smoke more heavily.

Eighteen percent of the women surveyed were both current smokers and current drinkers. However, there was no significant association found between current smoking and current drinking. That is, women who smoked in the past month were not more likely to drink in the past month and vice versa.

FIGURE 4.2
Among Women Who Smoked in the Past Month, Average Number of Cigarettes Smoked Per Day (N=274)



SUMMARY

- Sixty-one percent of the women surveyed had tried smoking cigarettes, 45 percent had been regular smokers at some time during their lives, and 27 percent were current smokers (i.e., smoked in the past month).
- Higher rates of current smoking were found among younger women, the previously married, the less educated, and those in blue collar and service industry occupations.
- Of current smokers, 51 percent reported smoking 10 or fewer cigarettes per day, 39 percent smoked 11 to 20, and 10 percent smoked 21 or more.
- Heavier smokers tended to be older, previously married, less educated, and living in greater Minnesota.
- Current smokers were not more likely to be current drinkers, nor vice versa.

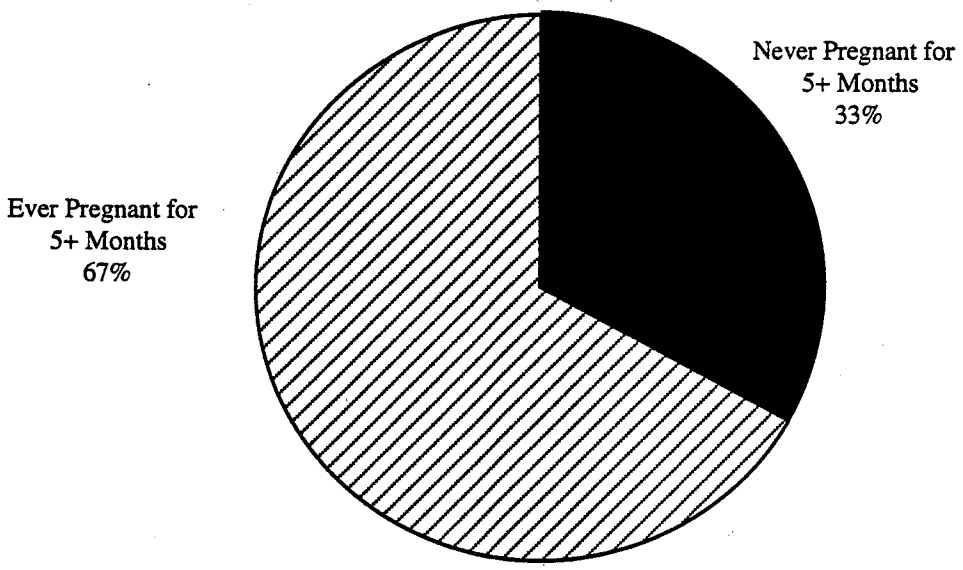
CHAPTER V: DRINKING DURING MOST RECENT PREGNANCY

PREGNANCIES AMONG THE WOMEN SURVEYED

The survey findings reported in this chapter refer to the most recent pregnancy of five or more months. Recall that this length was chosen because there is a high likelihood that the woman intends to carry the pregnancy to full term after reaching this point.

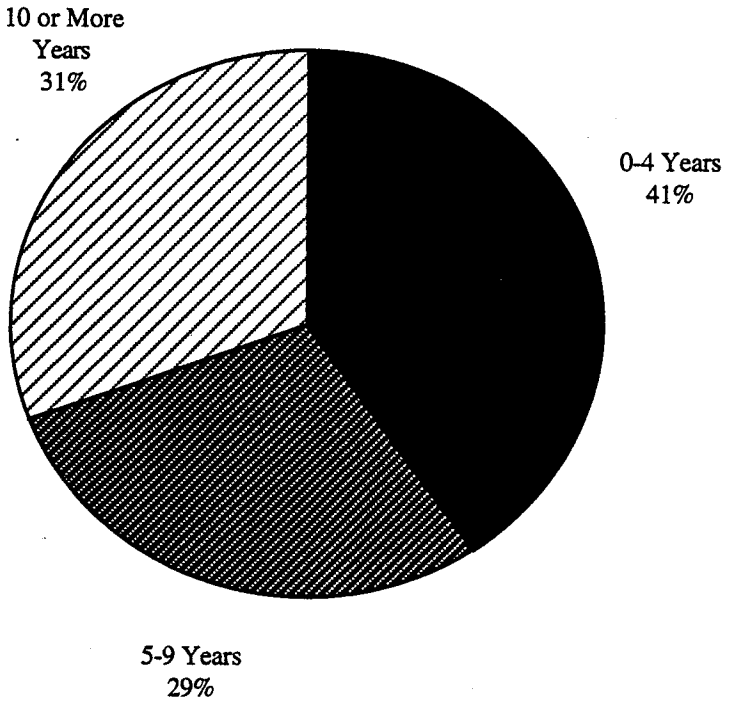
Sixty-seven percent of the women surveyed (n=686) had been pregnant at least once for five or more months (see Figure 5.1). Among these women the average number of pregnancies of this length was 2.3. Twenty-six percent had been pregnant once for five or more months, 41 percent, twice, 22 percent, three times, and 12 percent, four or more times.

FIGURE 5.1
Women Ever Pregnant for Five or More Months (N=1,016)



Among women who had been pregnant at least once for five or more months, 41 percent had their most recent pregnancy of this length less than five years ago, including 2 percent who were five or more months pregnant at the time of the survey. Twenty-nine percent had their most recent pregnancy of this length five to nine years ago and 31 percent had it 10 or more years ago (see Figure 5.2).

FIGURE 5.2
Number of Years Ago of Most Recent Pregnancy of Five or More Months[a]

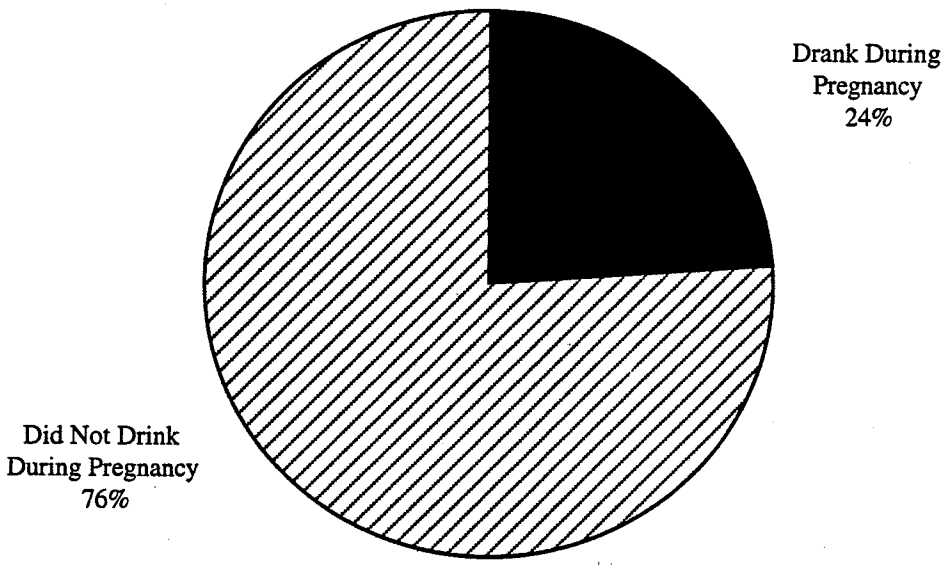


a Includes only those who were pregnant for 5 or more months at least once (n=686).

DRINKING PATTERNS DURING MOST RECENT PREGNANCY

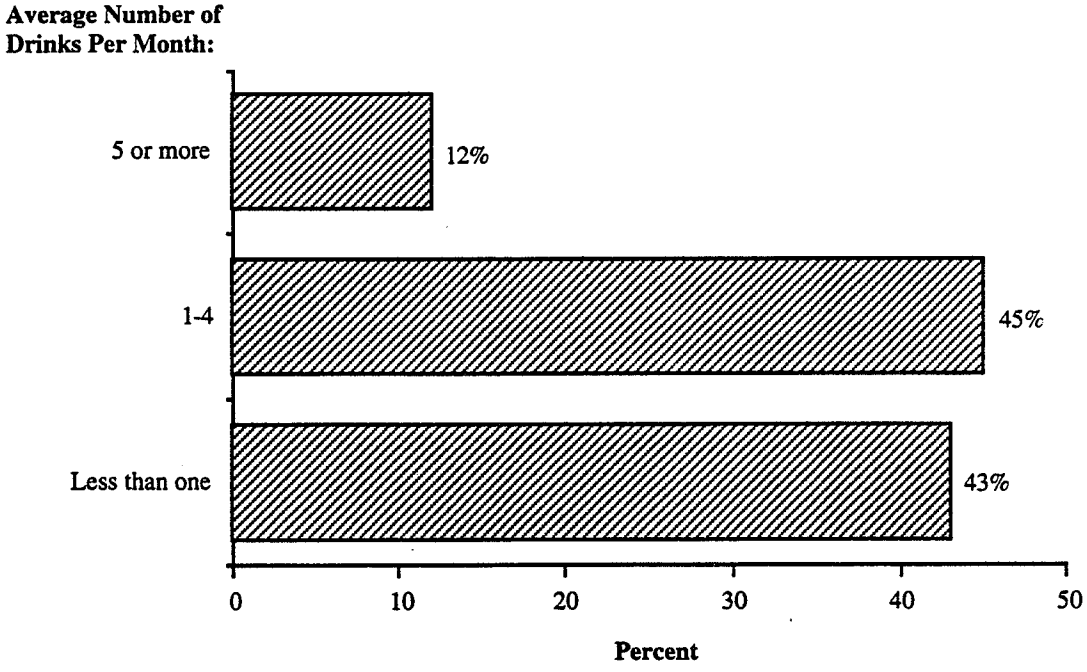
Twenty-four percent of the women reported drinking alcohol during their most recent pregnancy (see Figure 5.3). Whether or not women drank during their most recent pregnancy was not related to their demographic characteristics (age, marital status, education, occupation or place of residence). It was also not associated with how long ago they had their most recent pregnancy. However, women who were current drinkers (i.e., drank in the past 30 days) were more likely to drink during their most recent pregnancy than women who weren't current drinkers (32% vs. 15%).

FIGURE 5.3
Women Who Drank Any Alcoholic Drinks During Most Recent Pregnancy of Five or More Months (N=686)



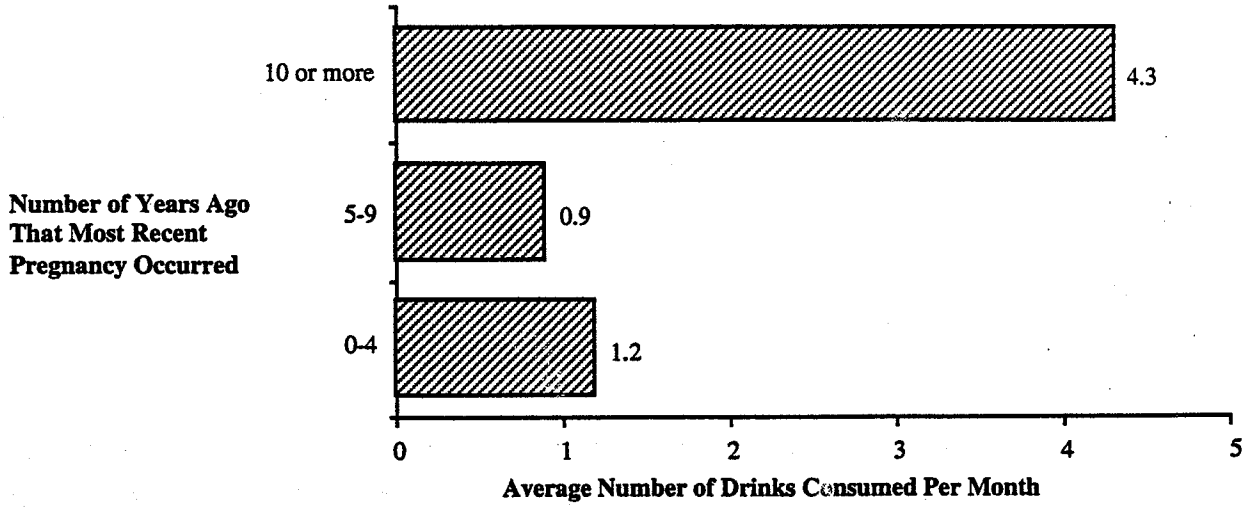
Among women who drank any alcohol during their most recent pregnancy, 43 percent reported consuming less than one drink per month, on the average, during the pregnancy, 45 percent reported consuming one to four drinks per month, and 12 percent reported consuming five or more drinks per month (see Figure 5.4). Women who had their most recent pregnancy 10 or more years ago tended to consume more drinks per month during the pregnancy than women who had their most recent pregnancy a shorter time ago. Hence, whether a woman drank any alcohol during pregnancy was not related to how long ago the pregnancy occurred, but among women who drank during pregnancy, the amount drunk was higher for pregnancies occurring a longer time ago (see Figure 5.5).

FIGURE 5.4
Number of Drinks Per Month During Most Recent Pregnancy[a]



a Includes only those who drank during their most recent pregnancy of five or more months (n=164).

FIGURE 5.5
Number of Drinks Consumed Per Month During Most Recent Pregnancy by Number of Years Ago That It Occurred[a]



F (2,161) = 3.50, p < .05.

a Includes only those who drank alcohol during their most recent pregnancy of five or more months (n=164).

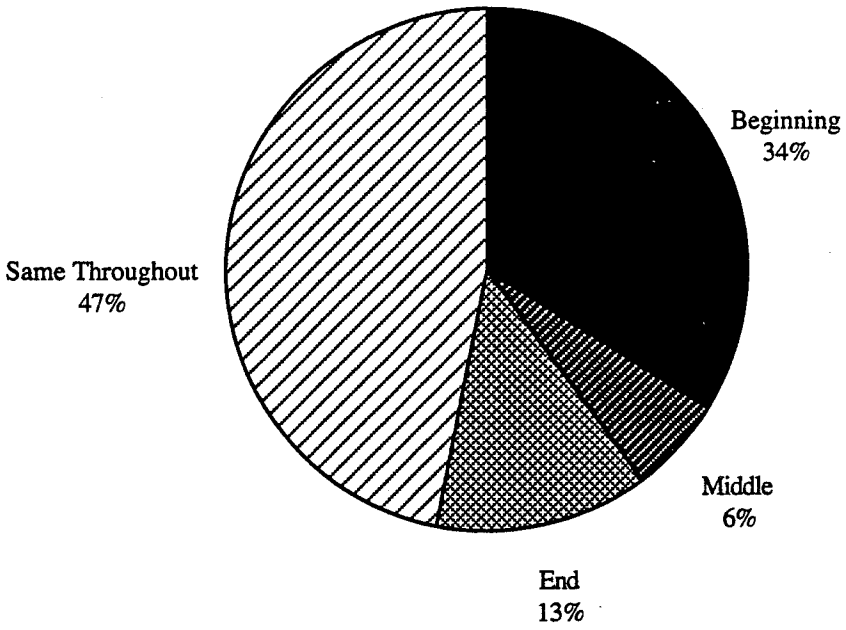
Among women who drank during pregnancy, the amount consumed per month was not associated with demographic characteristics, with one exception. Women who were previously married at the time of the survey drank more during their most recent pregnancy than women who were married or never married -- an average of 3.1 drinks per month compared to 0.9 for married women and 1.2 for never married women. It should be noted that the marital status of these previously married women may have been different at the time of their pregnancy -- i.e., many of them may have been married at the time of their pregnancy.

Only 5 percent (n=8) of the women who drank during their most recent pregnancy reported having five or more drinks on an occasion during the pregnancy. Hence, binge drinking during pregnancy was rare among the women surveyed. Most pregnant women (79%) who drank averaged only one drink per day on the days they drank, 15 percent averaged two drinks, and 6 percent averaged three to four drinks.

Among women who drank during their most recent pregnancy, 34 percent drank more at the beginning of the pregnancy, 6 percent more in the middle, 13 percent more at the end, and 47 percent the same throughout (see Figure 5.6). One reason why some women drank more at the beginning is that they stopped drinking once they realized they were pregnant. Nevertheless, those who said that they drank the same throughout the pregnancy did not report drinking significantly larger amounts during pregnancy than women who drank more at the beginning, middle or end of their pregnancies. The women who drank the same throughout the pregnancy were also not different demographically from the other women.

The 1989 Minnesota Household Survey of Drug and Alcohol Use Among Adults found a higher rate of drinking during most recent pregnancy than the current survey -- 41 percent vs. 24 percent (Research News, Minnesota Department of Human Services, Chemical Dependency Division, January, 1993.) However, the 1989 survey also found that most women who drank while pregnant drank very lightly.

FIGURE 5.6
Period During Most Recent Pregnancy When Women Drank More[a]



[a] Includes only those who drank alcohol during their most recent pregnancy of five or more months (n=163).

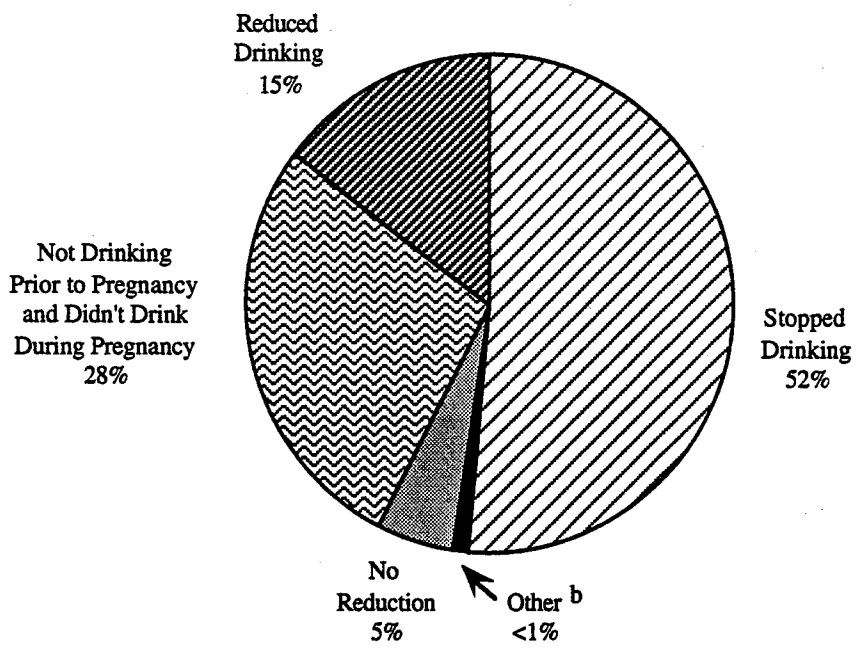
CHANGES IN DRINKING DUE TO PREGNANCY

Figure 5.7 indicates changes or stability in drinking during the most recent pregnancy for women who ever drank alcohol. Fifty-two percent stopped drinking during the pregnancy, 15 percent reduced the amount they were drinking, 28 percent were not drinking prior to the pregnancy and didn't drink during the pregnancy, and 5 percent made no reduction in their drinking while pregnant. Of those who were drinking prior to their pregnancy, 93 percent either reduced or stopped their drinking while pregnant. Those who didn't reduce their drinking during pregnancy tended to be light drinkers. They did not drink any more per month during pregnancy than those who reduced their drinking (average of 2.4 and 2.5 drinks per month, respectively). Those who reduced or stopped drinking during pregnancy did not differ demographically from those who continued to drink the same amount during pregnancy.

It should also be noted that among those who reduced or stopped their drinking during pregnancy, most (93%) apparently did so after they realized they were pregnant rather than prior to their pregnancy (7%) because they were planning to become pregnant.

Most (79%) of the women who reduced or stopped their drinking during their most recent pregnancy resumed (i.e., started or increased) their drinking after their pregnancy ended. However, the length of time after the pregnancy ended that they resumed drinking varied. Twenty-nine percent resumed within four weeks after the pregnancy ended, 20 percent did so within five to eight weeks, another 20 percent within nine to 16 weeks, and 31 percent after 17 or more weeks.

FIGURE 5.7
Change/Stability in Drinking During Most Recent Pregnancy of Five or More Months[a]



a Includes only women who ever drank alcohol (n=661).

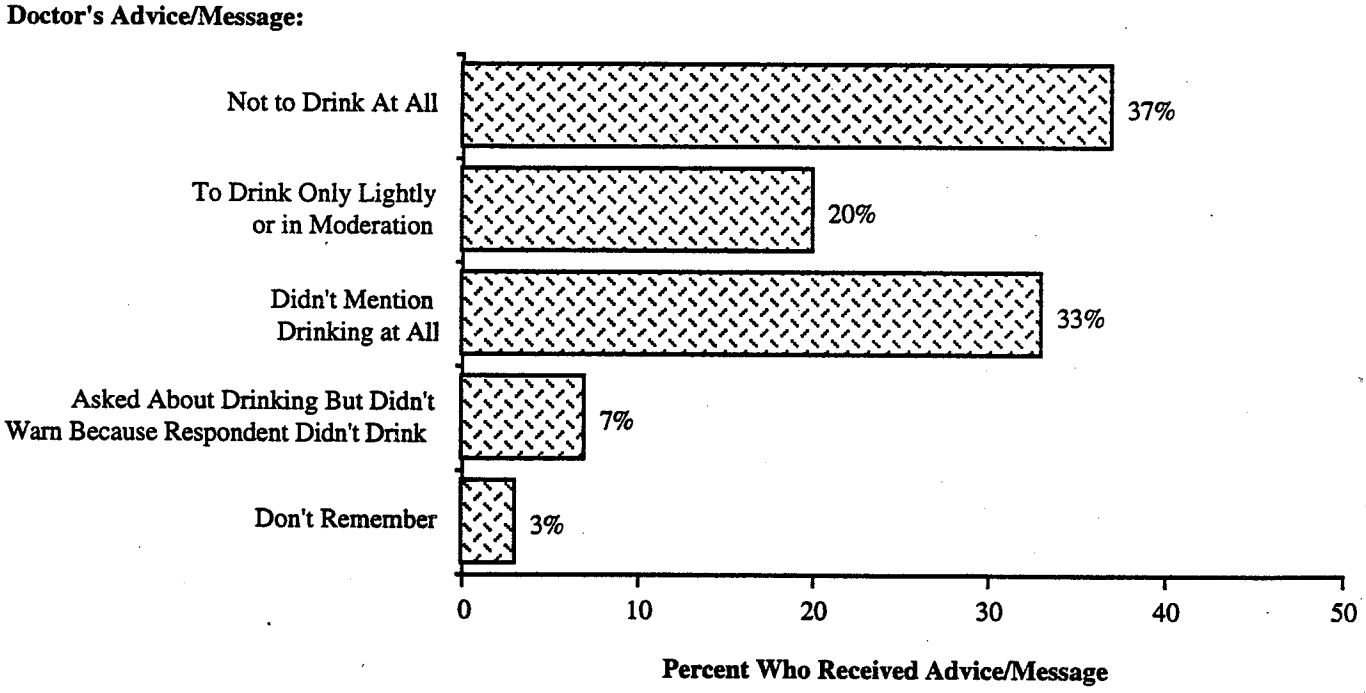
b Includes one respondent who started drinking during pregnancy, and one who decreased her drinking early in the pregnancy and, then, increased it.

DOCTOR'S ADVICE AND DRINKING DURING MOST RECENT PREGNANCY

Ninety-five percent of the women said they visited a doctor within the first three months of their most recent pregnancy. Five percent visited within four to six months, and only one respondent didn't visit a doctor at all. Most of the women (89%) visited the doctor nine or more times during the pregnancy, including 36 percent who visited the doctor 15 or more times.

We asked respondents whether their doctor or health care provider had advised them about drinking during their most recent pregnancy. Thirty-seven percent said the doctor advised them not to drink at all, 20 percent said the doctor advised them to drink only lightly or in moderation, and 33 percent said the doctor didn't mention drinking at all (see Figure 5.8). Women who had been pregnant a shorter time ago were more likely to be advised by their doctors not to drink. For example, among those whose most recent pregnancy occurred within the past four years, 49 percent were advised by their doctors not to drink at all and the doctor didn't mention anything about drinking for 23 percent.

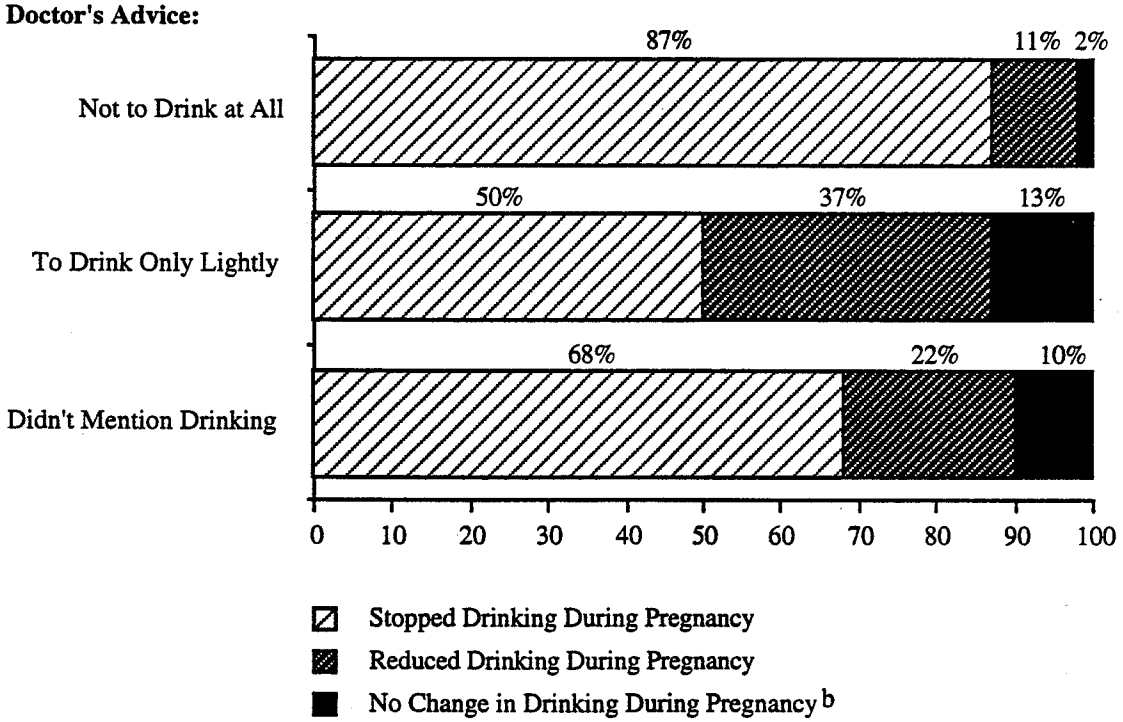
FIGURE 5.8
Doctor's Advice Regarding Drinking During Most Recent Pregnancy of Five or More Months (N=686)



Doctors' advice seemed to influence women's drinking during pregnancy. Among women who were drinking prior to their most recent pregnancy, Figure 5.9 shows the proportions who stopped, reduced or maintained their drinking during pregnancy according to what their doctor told them. Those who were told not to drink at all during pregnancy were the most likely to stop drinking while pregnant. Those who were told to drink only lightly or in moderation were the most likely to reduce their drinking. However, most of those to whom the doctor said nothing about drinking still reduced or stopped their drinking, suggesting that awareness of the hazards of drinking during pregnancy is widespread apart from doctors' counsel. There may be other reasons, too, for reducing or stopping alcohol consumption such as changing taste preferences in foods or beverages brought about by the pregnancy.

Finally, 55 percent of the women who had never been pregnant said that their doctor or health care provider had advised them to avoid drinking alcohol should they become pregnant.

FIGURE 5.9
Doctor's Advice and Drinking During Most Recent Pregnancy[a]



Chi square (4) = 46.51, p < .001

a Includes only those who were drinking prior to their most recent pregnancy of five or more months (n=444).

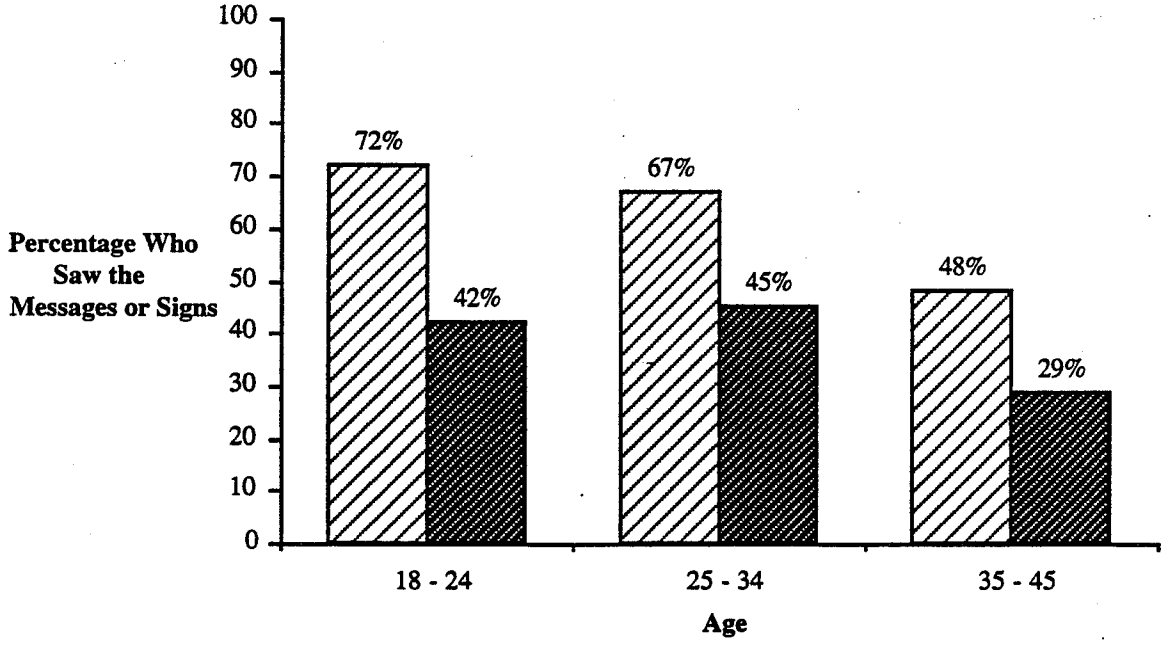
b Includes one respondent who started drinking during pregnancy, and one who decreased her drinking early in the pregnancy and, then, increased it.

WARNING SIGNS AND MESSAGES ABOUT DRINKING DURING PREGNANCY

Fifty-seven percent of all those surveyed (or 59 percent of those who had ever drunk alcohol) said they had seen messages on bottles of beer, wine or liquor warning pregnant women not to drink. Among those who had ever drunk alcohol, younger women and those who had never been married were more likely to have seen these messages. With regard to age, 72 percent of those under 25 had seen such messages compared to 67 percent of 25 to 34 year olds and only 48 percent of 35 to 45 year olds (see Figure 5.10). Seventy-two percent of never married women had seen the messages compared to 56 percent of married and previously married women.

Thirty-six percent of all those surveyed (or 37 percent those who had ever drunk alcohol) said that they had seen signs in bars, restaurants or liquor stores warning pregnant women not to drink. Again, those 35 and older were less likely to see these signs than those under 35 -- 29 percent vs. 44 percent (see Figure 5.10).

FIGURE 5.10
Age and Seeing Warning Signs/Messages About Drinking During Pregnancy[a]



[a] Only those who had ever drunk alcohol are included in this analysis.

SUMMARY

Pregnancies Among the Women Surveyed

- Two-thirds of the women surveyed had been pregnant sometime during their lives for five or more months.
- Among these women, 41 percent had their most recent pregnancy of five or more months less than five years ago, 29 percent had it five to nine years ago, and 31 percent had it 10 or more years ago.

Drinking Patterns During Most Recent Pregnancy

- About one-quarter (24%) reported drinking alcohol during their most recent pregnancy of five or more months.
- Those who drank during their pregnancy tended to drink lightly. Forty-three percent said they consumed less than one drink per month during pregnancy, 45 percent averaged one to four drinks per month, and 12 percent averaged five or more drinks per month.
- Binge drinking during pregnancy was rare. Only 5 percent (n=8) of the women who drank during pregnancy reported binge drinking (which is 1 percent of all the women who were pregnant).
- Those who had their most recent pregnancy 10 or more years ago were not more likely to drink during the pregnancy, but if they drank, they tended to drink more than women who were pregnant a shorter time ago.
- Women who drank during their most recent pregnancy were similar demographically to those who didn't.
- Current drinkers were more likely to have drunk during their most recent pregnancy.

Changes in Drinking Due to Pregnancy

- Of those who were drinking prior to their most recent pregnancy, 93 percent either reduced or stopped drinking while pregnant.
- Most women who reduced or stopped drinking during pregnancy apparently did not do so until after they realized they were pregnant rather than doing so prior to pregnancy because they were planning to become pregnant.
- Those who did not reduce their drinking during pregnancy tended to be light drinkers. They did not drink any more during pregnancy than those who reduced their drinking.
- Most (79%) of the women who reduced or stopped their drinking during pregnancy resumed (i.e., started or increased) their drinking after the pregnancy ended.

Doctor's Advice and Drinking During Most Recent Pregnancy

- Ninety-five percent reported visiting a doctor within the first three months of their most recent pregnancy, and 5 percent visited within four to six months.

- Of women who visited their doctors during pregnancy, 37 percent said the doctor advised them not to drink at all, 20 percent advised them to drink only lightly, 33 percent didn't mention drinking at all, 7 percent asked about drinking but didn't warn them because they don't drink, and 3 percent couldn't remember if the doctor said anything about drinking.

- Those who were pregnant a shorter time ago were more likely to be advised by their doctors not to drink at all during pregnancy.

- Doctors' advice seemed to influence women's drinking during pregnancy. Those who were told not to drink during pregnancy were the most likely to stop while those who were told to drink only lightly were the most likely to reduce their drinking. However, most of those to whom the doctor said nothing about drinking still reduced or stopped their drinking while pregnant.

- Fifty-five percent of women who had never been pregnant had been advised by their doctors to avoid drinking alcohol should they become pregnant.

Warning Signs and Messages About Drinking During Pregnancy

- Fifty-seven percent of all those surveyed had seen messages on bottles of beer, wine and liquor warning pregnant women not to drink.

- Thirty-six percent had seen signs in bars, restaurants or liquor stores warning pregnant women not to drink.

- Women under age 35 were more likely to have seen these messages and signs than women 35 and older.

CHAPTER VI: CIGARETTE SMOKING DURING MOST RECENT PREGNANCY

SMOKING BEHAVIOR DURING MOST RECENT PREGNANCY

Twenty-two percent of the women surveyed reported smoking cigarettes during their most recent pregnancy (see Figure 6.1). Again, study findings regarding smoking and pregnancy refer to the most recent pregnancy of five or more months. Of those who smoked during their most recent pregnancy, 64 percent smoked 10 or fewer cigarettes per day, 31 percent smoked 11 to 20, and 5 percent smoked 21 or more (see Figure 6.2).

FIGURE 6.1
Cigarette Smoking During Most Recent Pregnancy of Five or More Months (N=686)

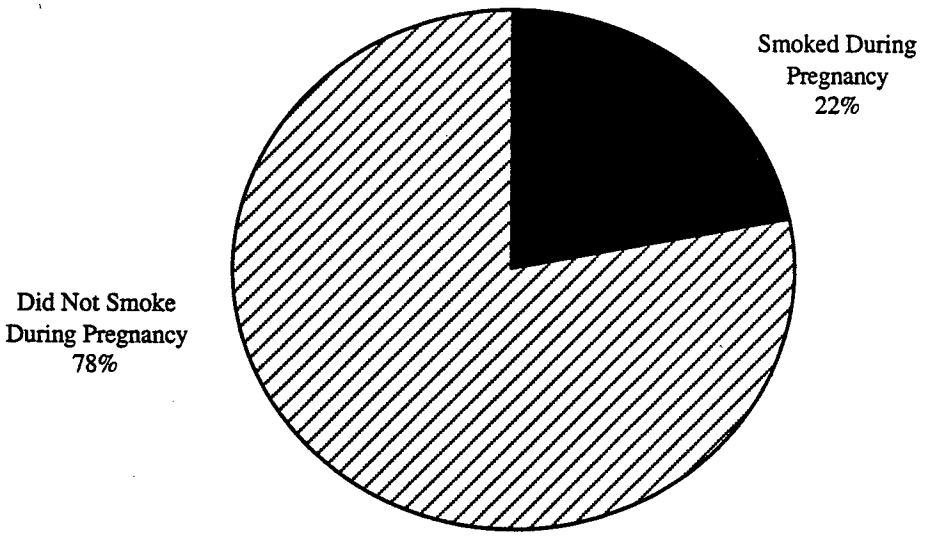
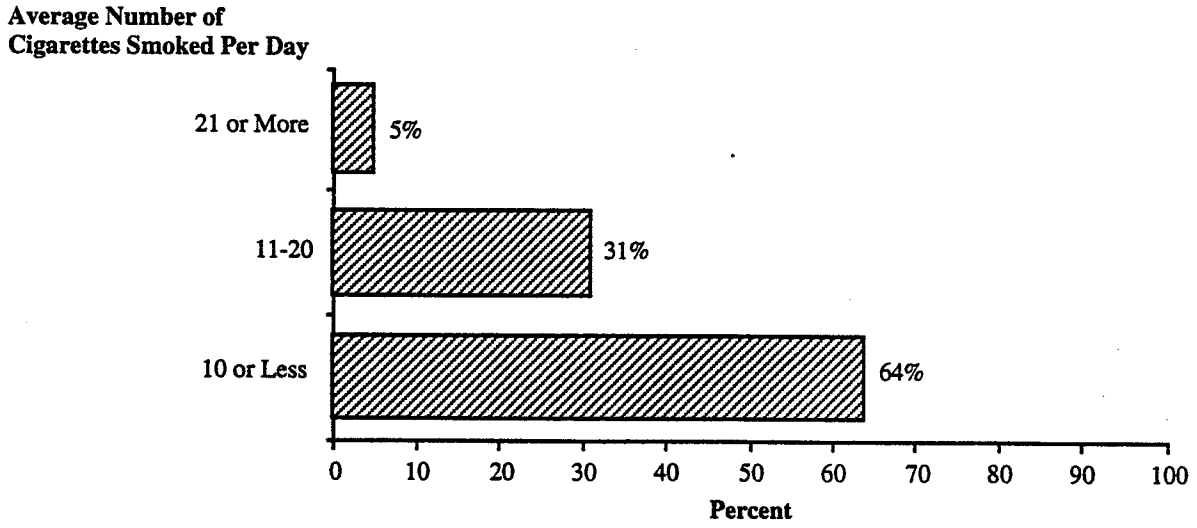


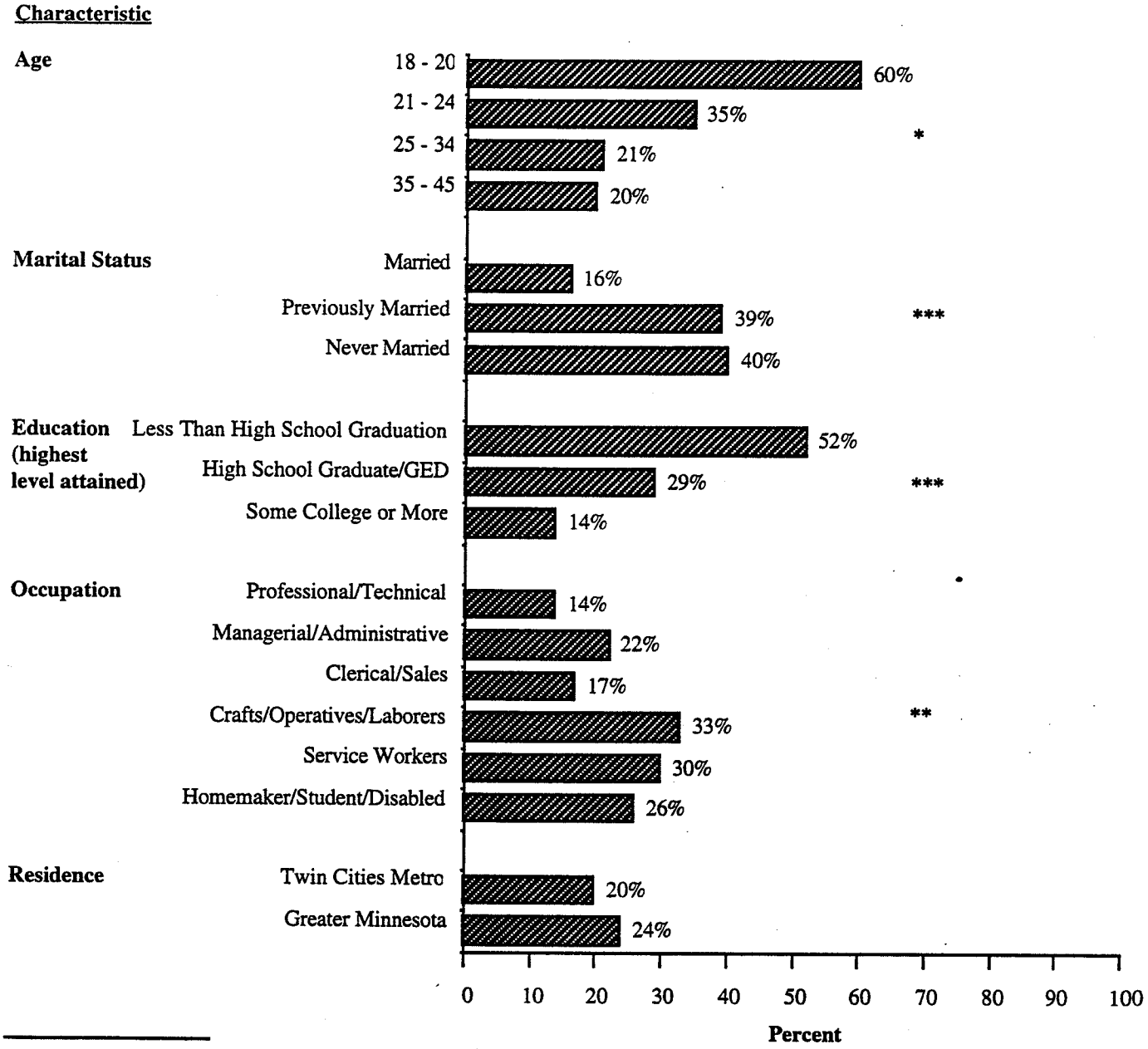
FIGURE 6.2
Number of Cigarettes Smoked Per Day During Most Recent Pregnancy[a]



a Includes only those who smoked cigarettes during their most recent pregnancy of five or more months (n=148)

Those who smoked during their most recent pregnancy tended to be younger, to be unmarried, to have less education and to have blue collar or service industry jobs (see Figure 6.3). Eighteen to 20 year olds were three times more likely to smoke during pregnancy than 35 to 45 year olds (60% vs. 20%). Those who were currently unmarried (never married or previously married) were more than twice as likely to smoke during pregnancy as currently married women. Over half (52%) of women who had not completed high school smoked during their most recent pregnancy compared to 14 percent of the women who had attended college. Furthermore, among women who smoked during pregnancy, women who didn't complete high school smoked more cigarettes per day (17, on the average) than women who were high school graduates (10, on the average).

FIGURE 6.3
Smoking During Most Recent Pregnancy and Demographic Characteristics (N=686)



* $p < .05$

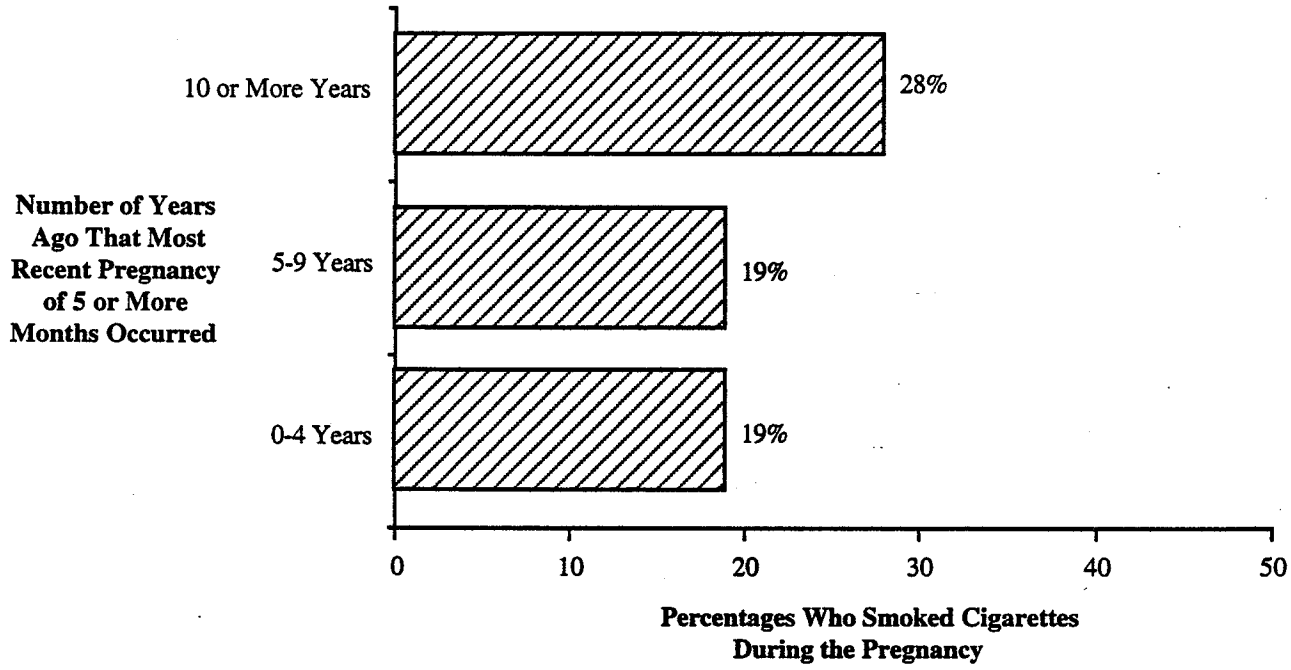
** $p < .01$

*** $p < .001$

Women were more likely to smoke during their most recent pregnancy if it occurred a longer time ago. Hence, women who had their most recent pregnancy 10 or more years ago had a higher rate of smoking than those who were pregnant a shorter time ago (see Figure 6.4). However, among those who smoked during pregnancy, it did not appear that women who were pregnant a longer time ago smoked more heavily during pregnancy than those who were pregnant more recently.

Not surprisingly, current smokers were more likely to smoke during their most recent pregnancy than current non-smokers. Among women who had ever been regular smokers, 62 percent of current smokers smoked during their most recent pregnancy compared to 21 percent of current non-smokers.

FIGURE 6.4
Smoking During Most Recent Pregnancy by Number of Years Ago That It Occurred (N=686)

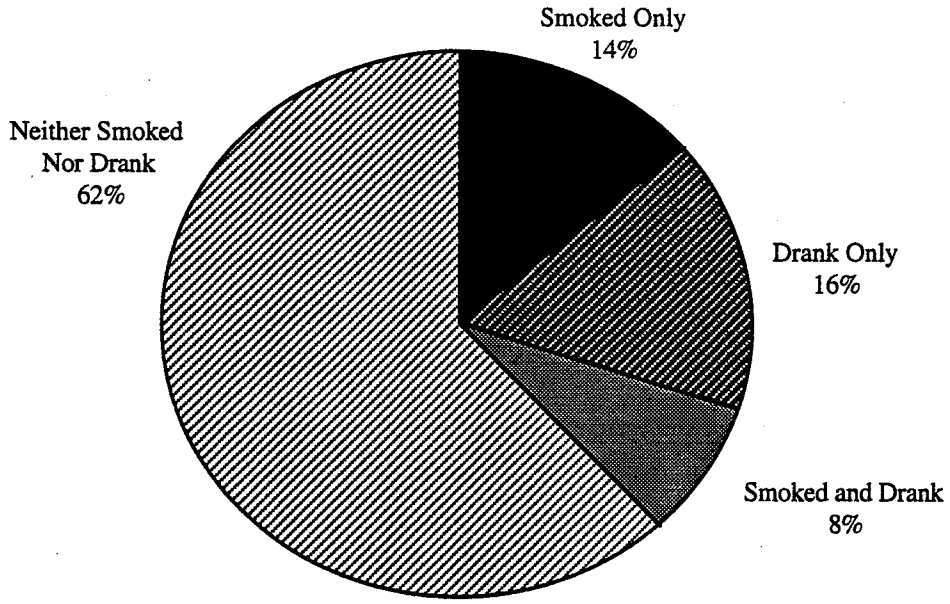


Chi square (2) = 6.30, $p < .05$.

Figure 6.5 shows the proportion of women who both smoked and drank during pregnancy, smoked only, drank only, and neither smoked nor drank. Over six in 10 women (62%) neither smoked nor drank, 14 percent smoked only, 16 percent drank only, and 8 percent both smoked and drank during pregnancy. Although the overlap between smoking and drinking was not large, those who smoked during pregnancy were slightly more likely to drink during pregnancy than those who didn't smoke, and vice versa.

The 1989 Minnesota Household Survey of Drug and Alcohol Use Among Adults also found an association between smoking and drinking during pregnancy (Research News, Minnesota Department of Human Services, Chemical Dependency Division, January, 1993). This 1989 survey found a somewhat higher rate of smoking among pregnant women than the current survey (30% vs. 22%). However, the prevalence of smoking during pregnancy among women under 25 appeared to be slightly higher in the current survey.

FIGURE 6.5
Smoking and Drinking During Most Recent Pregnancy of Five or More Months (N=686)



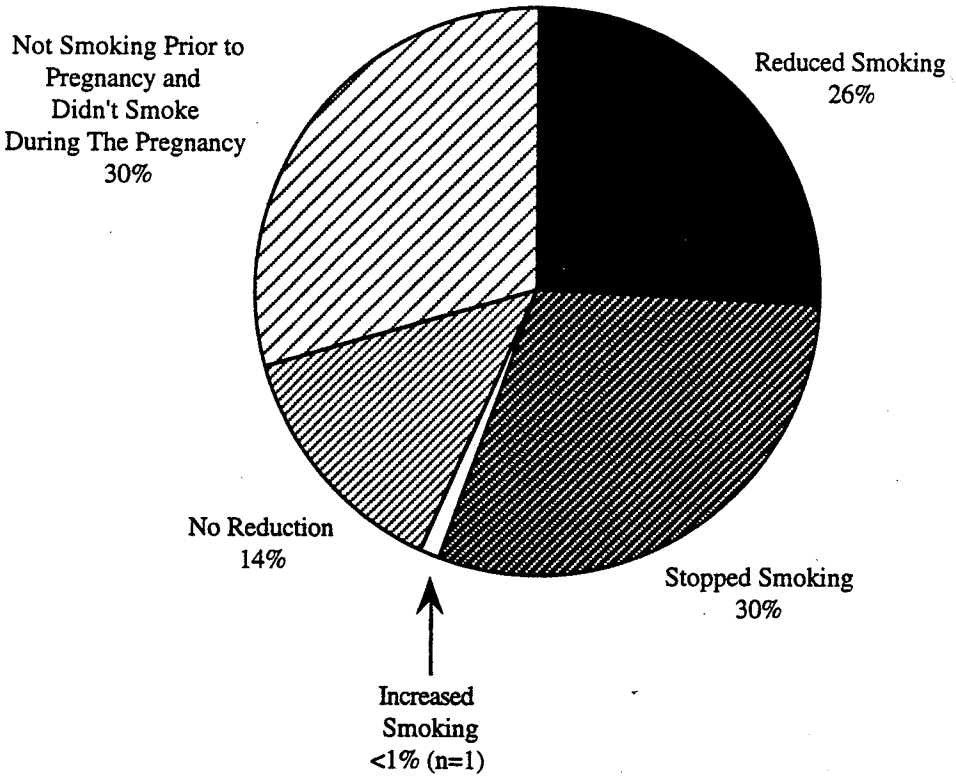
CHANGE IN SMOKING DUE TO PREGNANCY

Figure 6.6 shows change/stability in cigarette smoking during most recent pregnancy among women who had ever been regular smokers (i.e., smoked 100 or more cigarettes in their lives). Thirty percent of these women stopped smoking during the pregnancy, 26 percent reduced the number of cigarettes they were smoking, 30 percent were not smoking prior to the pregnancy and didn't smoke during the pregnancy, and 14 percent made no reduction in their smoking while pregnant. Of those who were smoking prior to the pregnancy, 80 percent either reduced or stopped their smoking while pregnant. Among women who reduced or stopped their smoking during pregnancy, 93 percent apparently did so when they realized they were pregnant while 7 percent did so prior to the pregnancy because they were planning to become pregnant.

We compared women who continued to smoke the same amount during their most recent pregnancy with women who reduced or stopped. These two groups did not differ significantly in demographic characteristics nor in the length of time since their most recent pregnancy. Women who did not reduce their smoking during pregnancy smoked an average of nearly a pack of cigarettes per day (i.e., 18 per day), while women who reduced during pregnancy averaged less than half a pack per day (i.e., 8 per day).

Almost three-quarters (73%) of those who reduced or stopped smoking during their most recent pregnancy resumed (i.e., started again or increased) smoking after the pregnancy ended. About half (52%) resumed within four weeks after the pregnancy ended. Twenty-two percent resumed smoking after five to eight weeks, 11 percent after nine to 16 weeks, and 14 percent after 17 weeks or more. Nevertheless, women who reduced or stopped smoking during their most recent pregnancy were slightly less likely to be smoking currently than women who didn't reduce or stop (69 percent and 83 percent, respectively, said they had smoked in the past month).

FIGURE 6.6
Changes in Cigarette Smoking During Most Recent Pregnancy of Five or More Months[a]



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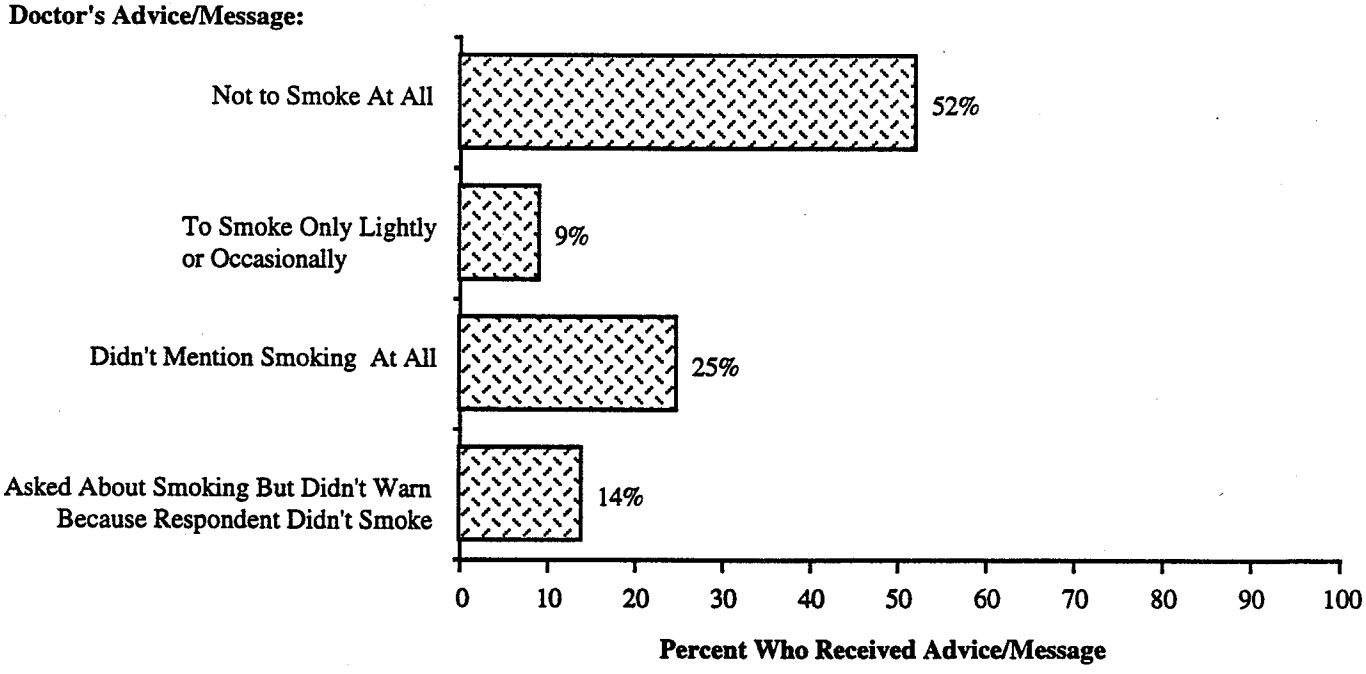
a Includes only those who smoked 100 or more cigarettes in their lives (n=337).

DOCTOR'S ADVICE AND SMOKING DURING MOST RECENT PREGNANCY

The women surveyed were asked whether their doctor or health care provider advised them about smoking cigarettes during their most recent pregnancy. Recall that 95 percent of the women visited a doctor within the first three months of the pregnancy and the remaining 5 percent visited the doctor within the next three months. Figure 6.7 indicates the nature of the doctor's advice women said they received. Only women who were regular smokers at some time in their lives are included in the figure. About half (52%) of the women said the doctor told them not to smoke at all, 9 percent said the doctor told them to smoke only lightly or occasionally, and 25 percent said the doctor didn't mention anything at all about smoking. The remaining 14 percent said the doctor asked about smoking but didn't warn them because they didn't smoke at the time. Women who had been pregnant a shorter time ago were slightly more likely to be advised by their doctors not to smoke. For example, among those whose most recent pregnancy occurred within the past four years, 58 percent were advised by their doctors not to smoke at all, and the doctor didn't mention anything about smoking for 17 percent.

FIGURE 6.7
Doctor's Advice Regarding Smoking During Most Recent Pregnancy of Five or More Months[a]

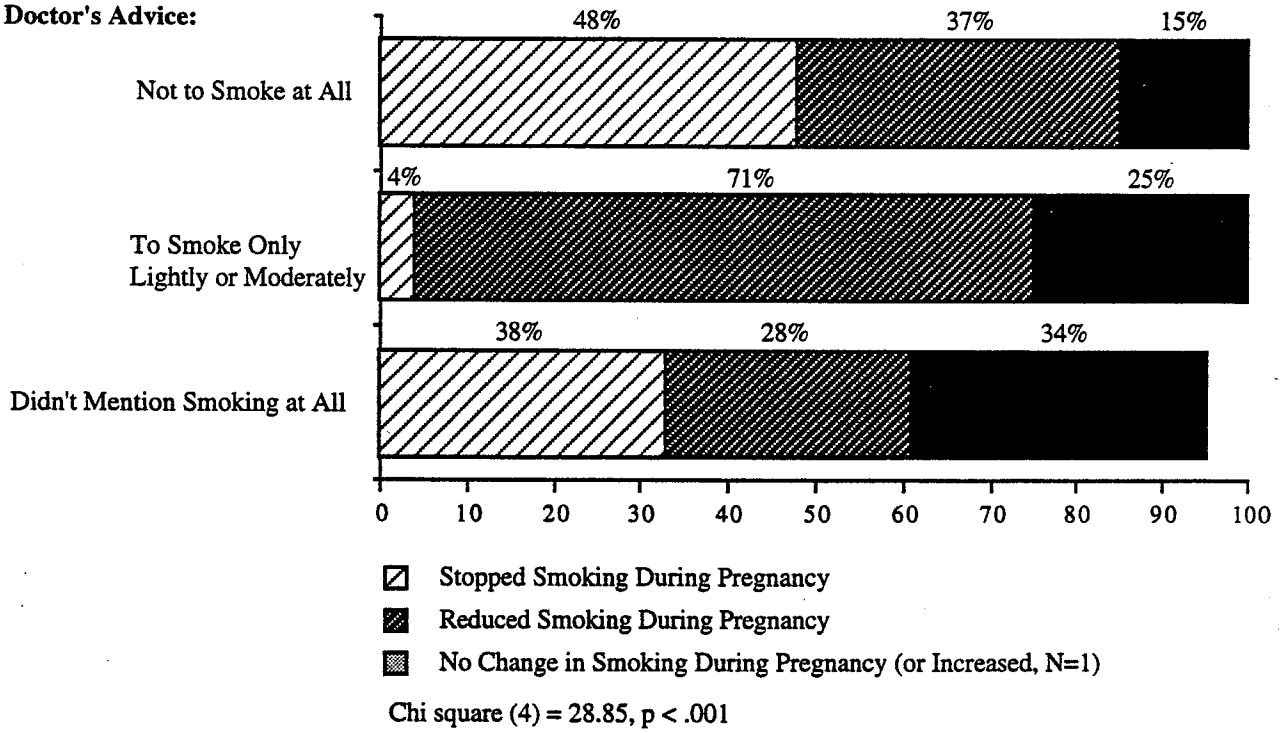


a Includes only those who smoked 100 or more cigarettes in their lives (n=334). One respondent who said the doctor told her it was okay to smoke during pregnancy is excluded from the graph.

Figure 6.8 strongly suggests that doctors' advice affects smoking during pregnancy. Among women who were smoking prior to their most recent pregnancy, 34 percent continued to smoke the same amount during pregnancy if the doctor said nothing about smoking, compared to 25 percent of those who were told by the doctor to smoke only lightly, and 15 percent of those who were told not to smoke at all. Almost half (48%) of those who were told not to smoke at all stopped smoking during pregnancy and 37 percent reduced their smoking. Most (71%) of those who were told to smoke only lightly by their doctors reduced their smoking, but only 4 percent stopped smoking while pregnant. Among those to whom the doctor said nothing about smoking, 38 percent stopped smoking and 28 percent reduced their smoking during pregnancy, suggesting that many women were aware of the dangers of smoking during pregnancy even though they weren't warned by their doctors.

Among women who had never been pregnant, 58 percent said a doctor or health care provider had advised them to avoid smoking should they become pregnant. The percentage that had been advised was slightly higher (64%) among the subgroup of never pregnant women who were regular smokers at some time in their lives.

FIGURE 6.8
Doctor's Advice and Smoking During Most Recent Pregnancy[a]



[a] Includes only those who were smoking prior to their most recent pregnancy of five or more months (n=225).

SUMMARY

Smoking Behavior During Most Recent Pregnancy

- Twenty-two percent of the women surveyed reported smoking cigarettes during their most recent pregnancy.
- Of those who smoked while pregnant, 64 percent smoked 10 or fewer cigarettes per day, 31 percent smoked 11 to 20, and 5 percent smoked 21 or more.
- Those who smoked during pregnancy tended to be younger (especially age 18 to 20), to be currently unmarried, to have less education (especially those who had not completed high school), and to have blue collar or service industry jobs.
- Among those who smoked during pregnancy, women who had not completed high school tended to smoke more heavily.
- Women who had their most recent pregnancy 10 or more years ago were more likely to smoke while pregnant than women who were pregnant a shorter time ago.
- Eight percent of the women both smoked and drank during their most recent pregnancy.

Changes in Smoking Due to Pregnancy

- Of those who were smoking cigarettes prior to their most recent pregnancy, 80 percent either reduced or stopped smoking while pregnant.
- Nearly three-quarters of those who reduced or stopped smoking during their most recent pregnancy resumed smoking (started again or increased) after the pregnancy ended.

Doctors' Advice and Smoking During Most Recent Pregnancy

- Among women who were regular smokers at some time in their lives, 52 percent were told by the doctor during their most recent pregnancy not to smoke at all, 9 percent were told to smoke only lightly or occasionally, 25 percent weren't told anything about smoking, and 14 percent were asked about smoking by the doctor but not warned because they were not smoking at that time.
- Those who were pregnant a shorter time ago were more likely to be advised by their doctors not to smoke at all during pregnancy.
- Doctors' advice seemed to affect women's smoking during pregnancy. Women who were told not to smoke at all by their doctors were the most likely to quit smoking during pregnancy. Those who were told to smoke only lightly were the most likely to reduce their smoking during pregnancy. Nevertheless, many women stopped or reduced their smoking during pregnancy even though they hadn't been advised by their doctors to do so.
- Sixty-four percent of never pregnant women who were regular smokers at some time in their lives had been advised by their doctors to avoid smoking should they become pregnant.

CHAPTER VII: KNOWLEDGE AND BELIEFS ABOUT SUBSTANCE USE DURING PREGNANCY

BELIEFS ABOUT HARM CAUSED BY SUBSTANCE USE DURING PREGNANCY

The women surveyed were asked to rate a series of items describing use of substances by a pregnant woman. They were to rate each item according to the likelihood that harm would be caused to the baby before it was born using a 5-point scale, where 1 meant not at all likely that harm would be caused and 5 meant extremely likely. Figure 7.1 indicates the percentage of women who rated each item as extremely likely to cause harm.

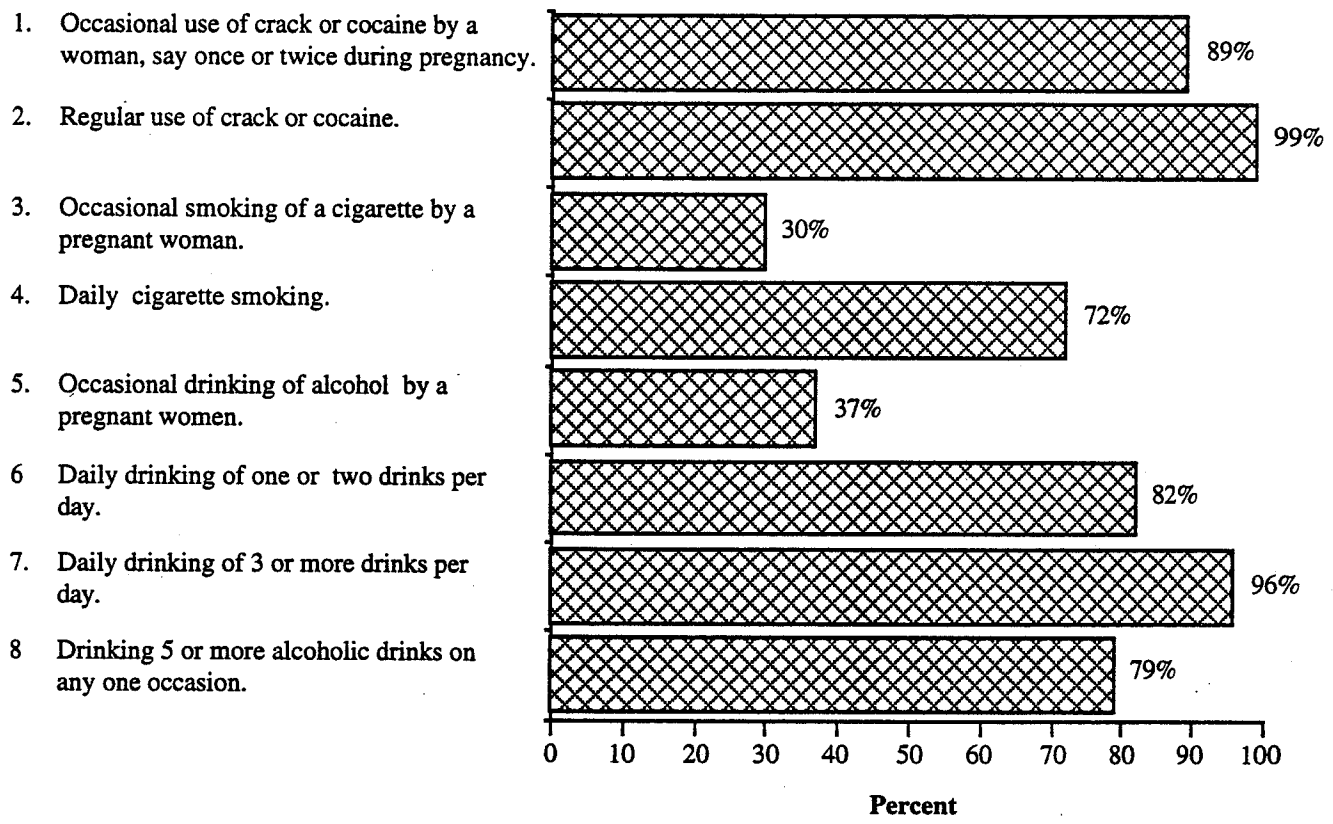
Most women rated the following things, if done during pregnancy, as extremely likely to cause harm to the baby: occasional or regular use of crack/cocaine, daily cigarette smoking, daily drinking, and binge drinking (five or more drinks on an occasion). Among those who thought binge drinking during pregnancy would be harmful, 55 percent felt it would be more harmful if done early in the pregnancy, 2 percent felt it would be more harmful if done in the middle, 2 percent more harmful if done at the end, and 41 percent felt the harm would be the same regardless of when it occurred during the pregnancy.

Approximately one-third of the women rated occasional cigarette smoking and occasional drinking during pregnancy as extremely likely to cause harm to the baby. Current smokers and those who smoked during pregnancy tended to rate occasional smoking during pregnancy as less likely to cause harm to the newborn. Current drinkers and those who drank during pregnancy tended to rate occasional drinking during pregnancy as less likely to cause harm to the newborn. Ratings on these two items did not differ much by demographic characteristics. However, previously married women had a slight tendency to rate occasional smoking or drinking during pregnancy as less harmful than other women.

Over eight in 10 women (83%) correctly believed harm to the newborn would be the same regardless of whether a pregnant woman drank beer, wine or liquor. Most of the remaining women (15%) said that liquor would cause the most harm. Answers to the question did not differ by demographic characteristics.

FIGURE 7.1
Beliefs About Likelihood of Harm Being Caused to Baby by Use of Substances During Pregnancy (N=1,017)

Percentage saying that it is extremely likely that the behavior described will cause harm to the baby before it is born.[a]



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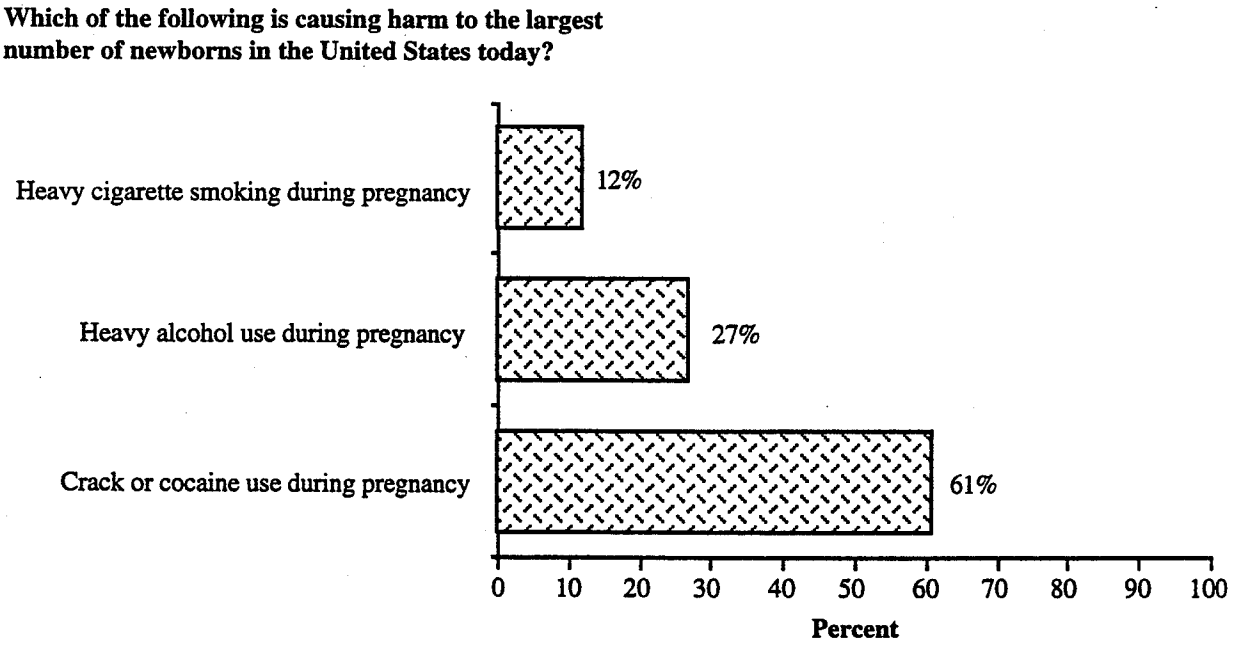
[a] Respondents rated each item on a 5-point scale, ranging from 1, not at all likely to cause harm to the baby to 5, extremely likely to cause harm.

TYPE OF SUBSTANCE USE THOUGHT TO CAUSE HARM TO THE LARGEST NUMBER OF NEWBORNS

Women were asked to indicate which of the following is currently causing harm to the largest number of newborns in the United States: heavy cigarette smoking, heavy alcohol use, or crack/cocaine use during pregnancy. Most women (61%) said that crack or cocaine use during pregnancy was causing harm to the largest number of newborns, although the research evidence doesn't support this view. Twenty-seven percent said heavy alcohol use was causing harm to the largest number and 12 percent said heavy smoking (see Figure 7.2). Women who had attended college were more likely to say heavy alcohol use or heavy smoking during pregnancy were causing harm to the largest number of newborns compared to women who had not attended college (see Figure 7.3). Answers to the question did not differ by age, marital status or place of residence (Metro area vs. greater Minnesota).

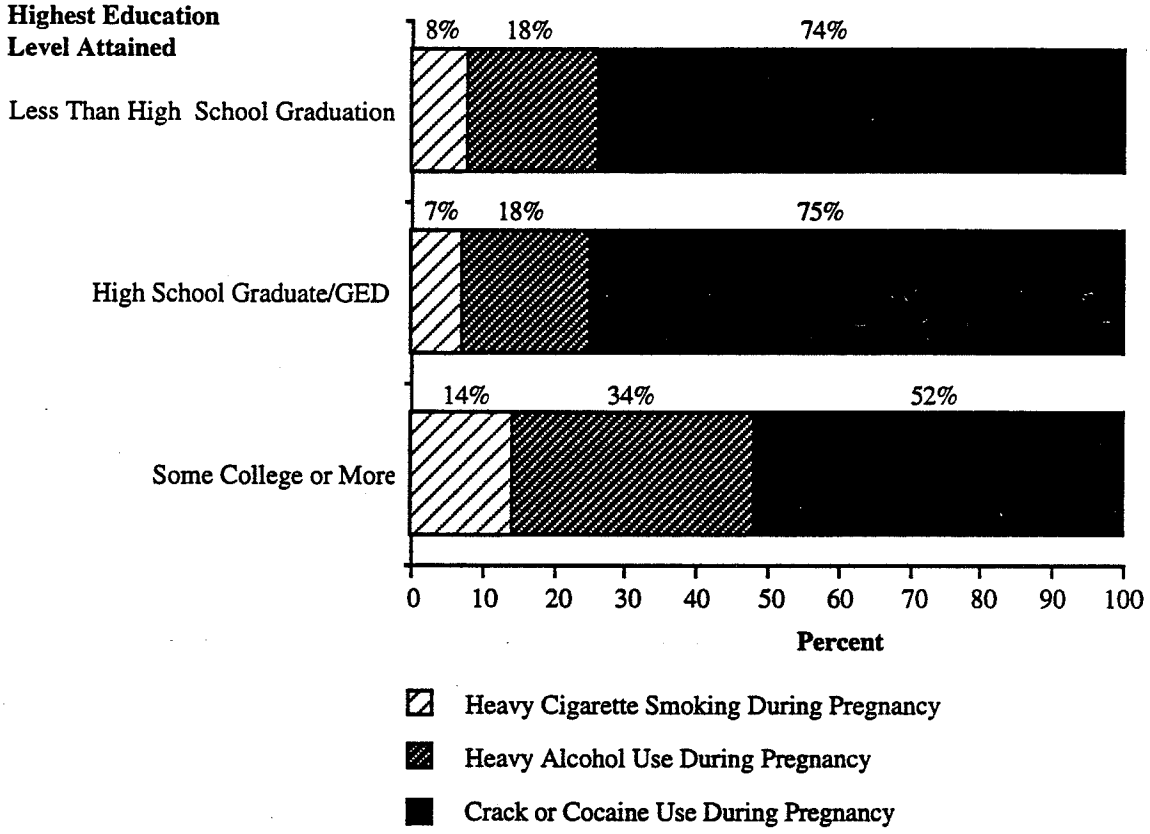
Women who smoked cigarettes during their most recent pregnancy were less likely to say that heavy cigarette smoking is causing harm to the largest number of newborns compared to those who didn't smoke during pregnancy (2% vs. 15%). Current smokers were also less likely than non-smokers to say that heavy cigarette smoking during pregnancy is causing harm to the largest number of newborns. Current drinkers and those who drank during their most recent pregnancy did not differ from others in their answers to what was causing harm to the largest number of newborns.

FIGURE 7.2
Type of Substance Use Thought to Cause Harm to the Largest Number of Newborns (N=1001)[a]



[a] There were 16 women who answered "don't know" who are excluded from the graph.

FIGURE 7.3
Type of Substance Use Thought to Cause Harm to the Largest Number of Newborns by Respondent's Educational Level (N=1,001)



SUMMARY

Beliefs About the Harm Caused by Substance Use During Pregnancy

- Most women felt the following things, if done during pregnancy, were extremely likely to cause harm to the newborn: occasional or regular use of crack/cocaine, daily cigarette smoking, daily drinking and binge drinking.

- About one-third felt that occasional smoking or occasional drinking during pregnancy were extremely likely to cause harm to the newborn. Current drinkers and those who drank during their most recent pregnancy tended to rate occasional drinking during pregnancy as less harmful to the newborn. Similarly, current smokers and those who smoked during their most recent pregnancy tended to rate occasional smoking during pregnancy as less harmful to the newborn.

- Most women (83%) correctly believed that harm to the newborn would be the same regardless of whether a pregnant woman drank beer, wine or liquor.

Type of Substance Use Thought to Cause Harm to the Largest Number of Newborns

- Sixty-one percent said that crack/cocaine use during pregnancy is causing harm to the largest number of newborns in the United States, although the research evidence doesn't support this view. Twenty-seven percent said heavy alcohol use was causing the most harm, and 12 percent said heavy smoking.

- Women who had attended college were more likely to say heavy alcohol use or heavy smoking during pregnancy were causing harm to the largest number of newborns compared to women who had not attended college.

- Current smokers and those who smoked during their most recent pregnancy were less likely to say that heavy smoking is causing harm to the largest number of newborns. However, current drinkers and those who drank during pregnancy did not differ from others in their answers to what was causing harm to the largest number of newborns.

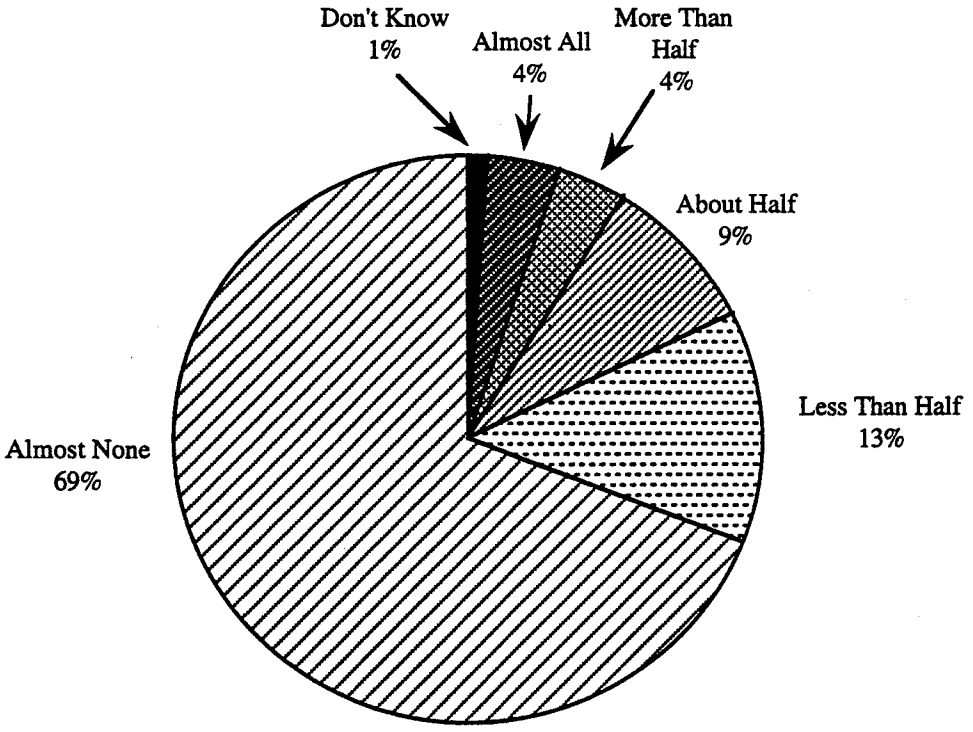
CHAPTER VIII: SOCIAL NORMS AND BEHAVIORS REGARDING DRINKING DURING PREGNANCY

BEHAVIOR AND BELIEFS OF THOSE KNOWN TO RESPONDENT

Survey respondents were asked to indicate how many of the women they knew drank alcohol at least occasionally while they were pregnant: almost all of them, more than half, about half, less than half, or almost none of them. Nearly seven in 10 (69%) answered almost none of them, 13 percent said less than half, 9 percent said half, 4 percent said more than half, and 4 percent said almost all of them (see Figure 8.1). Those who said almost none of the women they knew drank during pregnancy were less likely to have drunk during their own pregnancy than those who knew more women who drank during pregnancy -- 18 percent and 41 percent of these two groups, respectively, reported drinking during their most recent pregnancy.

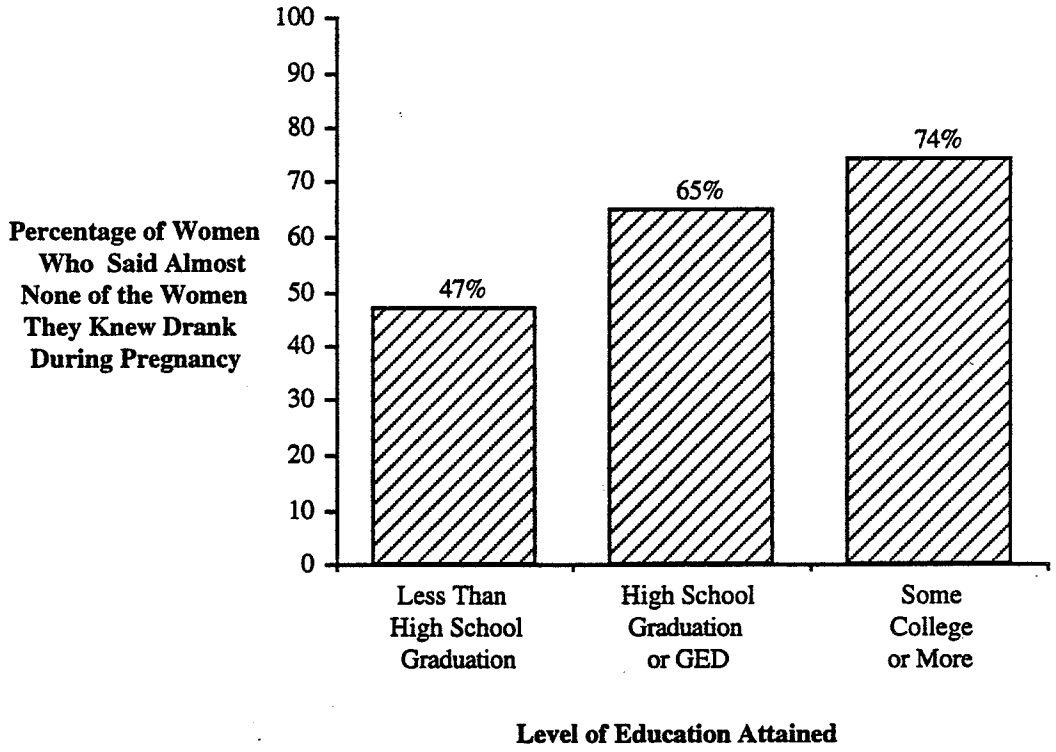
FIGURE 8.1
Drinking During Pregnancy Among Women the Respondent Knows (N=1,017)

Of the women the respondent knows, how many drink alcohol at least occasionally while they are pregnant?



Women with less education, especially those who didn't complete high school, were more likely to know women who drank during pregnancy. As Figure 8.2 indicates, 47 percent of those who had not completed high school said almost none of the women they knew drank during pregnancy compared to 65 percent of high school graduates who didn't attend college, and 74 percent of those who attended college. How many women respondents knew who drank during pregnancy was not associated with any other demographic characteristics.

FIGURE 8.2
Education Level and Knowing Women Who Drank During Pregnancy (N=1,007)



Respondents were asked whether other people around them would be concerned if they drank alcohol while pregnant. The people asked about included the respondent's mother, father, spouse or partner (if applicable), other close family members and close friends. Nearly all the respondents said that these people would be concerned. As Table 8.1 indicates, 85 to 92 percent of the respondents said that these people would be concerned across the five categories of people about whom we asked. Those respondents who said that one or more of the people asked about would not be concerned were more likely to drink during pregnancy, and if they drank, to drink slightly more. Never married women were more likely to say that all the people close to them would be concerned about them drinking during pregnancy.

TABLE 8.1
Concern of Family and Friends About Drinking While Pregnant (N=1,017)

Percentage who said the following people would be concerned if they (respondent) drank alcohol during pregnancy:

1.	Mother	88%
2.	Father	85%
3.	Spouse/Partner (if applicable)	92%
4.	Other Family Members Respondent Is Close To	90%
5.	Close Friends	90%

SOCIAL NORMS REGARDING DRINKING

Respondents were asked whether they strongly agreed, agreed, disagreed or strongly disagreed with a series of statements about drinking related behaviors and warnings. The percentages of women who agreed (i.e., strongly agreed or agreed) with each statement are shown in Figure 8.3. Almost two-thirds of the women (65%) agreed with the following two statements: "A bartender should refuse to serve alcohol to a woman who is obviously pregnant" and "When a person is offering alcoholic drinks to a group of friends, that person should only offer soft drinks to a friend who is pregnant." Women were about evenly divided (47% agreed) regarding whether "when a person is out with a friend who is pregnant, that person should also avoid drinking alcohol."

Only one-third of the women agreed that "when you see an obviously pregnant woman drinking alcohol at a bar who is not someone you know, you should warn her not to drink." Those who agreed that the pregnant woman should be warned were divided about whether they actually would warn her. In contrast, nearly nine in 10 women agreed (87%) that "when you see an obviously pregnant friend drinking alcohol at a bar, you should warn her not to drink." And most (82%) who agreed the friend should be warned said they actually would warn her.

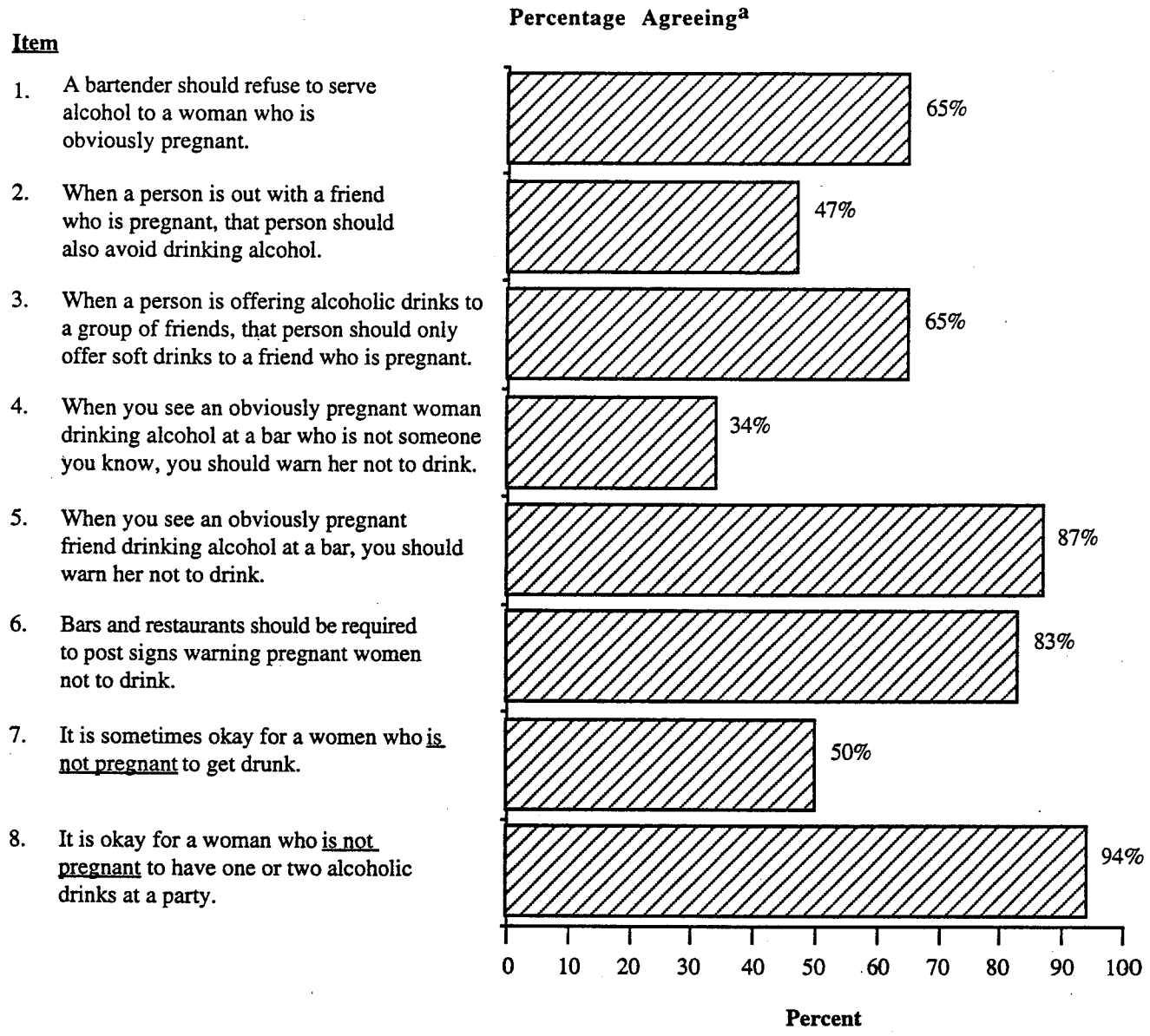
About eight in 10 agreed (83%) that "bars and restaurants should be required to post signs warning pregnant women not to drink." Women who had seen these signs in bars, restaurants or liquor stores were slightly more likely to agree that such signs should be required than women who hadn't seen them (91% vs. 79%).

Women were evenly divided (50% agreed) about whether "it is sometimes okay for a woman who is not pregnant to get drunk." However, over nine in 10 agreed (94%) that "it is okay for a woman who is not pregnant to have one or two alcoholic drinks at a party."

The first six items in Figure 8.3, all of which deal with behavior or warnings to discourage pregnant women from drinking, were combined into a scale. Scores on the "Drinking During Pregnancy Opinion" Scale were obtained by summing the scores to each of the items which were scored as follows: strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1. Hence, scores could range from six to 24, with higher scores indicating stronger endorsement of behaviors or warnings discouraging pregnant women from drinking.[1] The distribution of scores on the scale is shown in Figure 8.4 (mean = 16.9, standard deviation = 3.2).

[1] The Drinking During Pregnancy Opinion Scale was constructed based on a principal components factor analysis with varimax rotation of the eight items in Figure 8.3. Two factors emerged. The first factor contained the first six items in Figure 8.3 (loadings ranged from .60 to .78) and explained 38.5 percent of the total variance. The second factor contained the last two items (loadings of .75 and .81) and explained 16.4 percent of the total variance. The Drinking During Pregnancy Opinion Scale was created from the six first items. Internal consistency reliability for the scale was acceptable (Cronbach's alpha = .81).

FIGURE 8.3
Opinions About Drinking-Related Behaviors (N=1,017)



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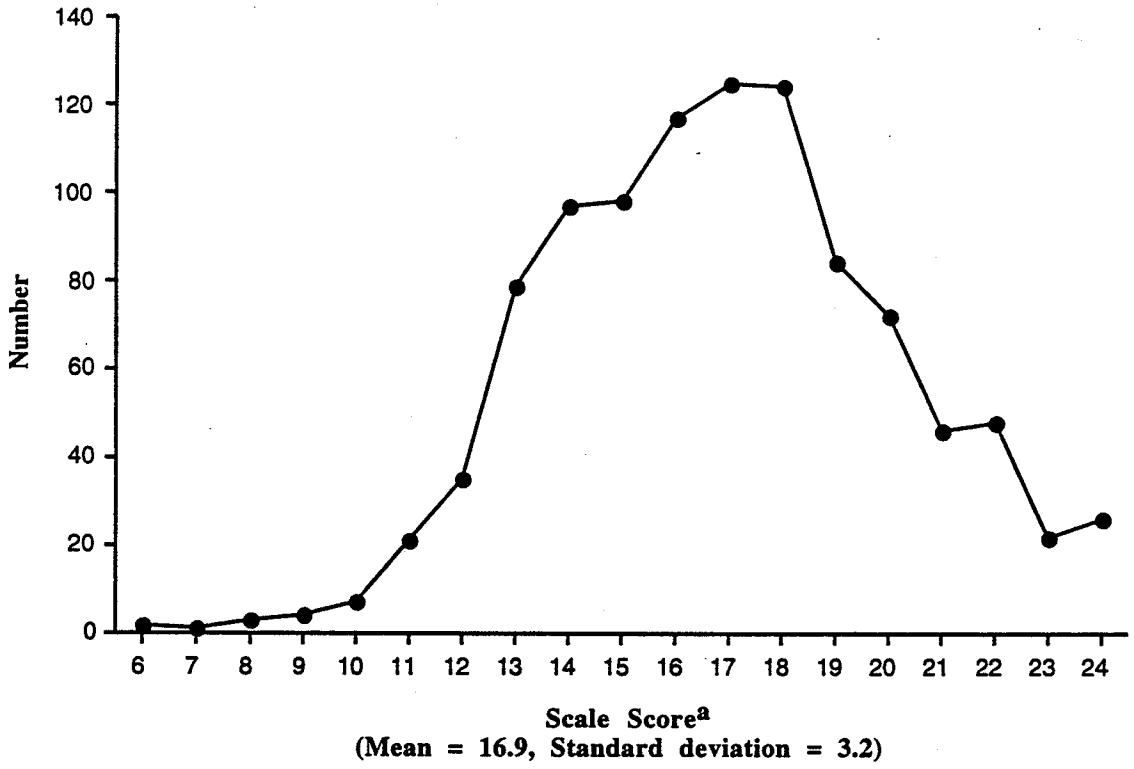
[a] Respondents indicated whether they strongly agreed, agreed, disagreed, or strongly disagreed with each item. The percentage who strongly agreed or agreed is reported.

FIGURE 8.4
Distribution of Scores on the Drinking During Pregnancy Opinion Scale (N=1,011)



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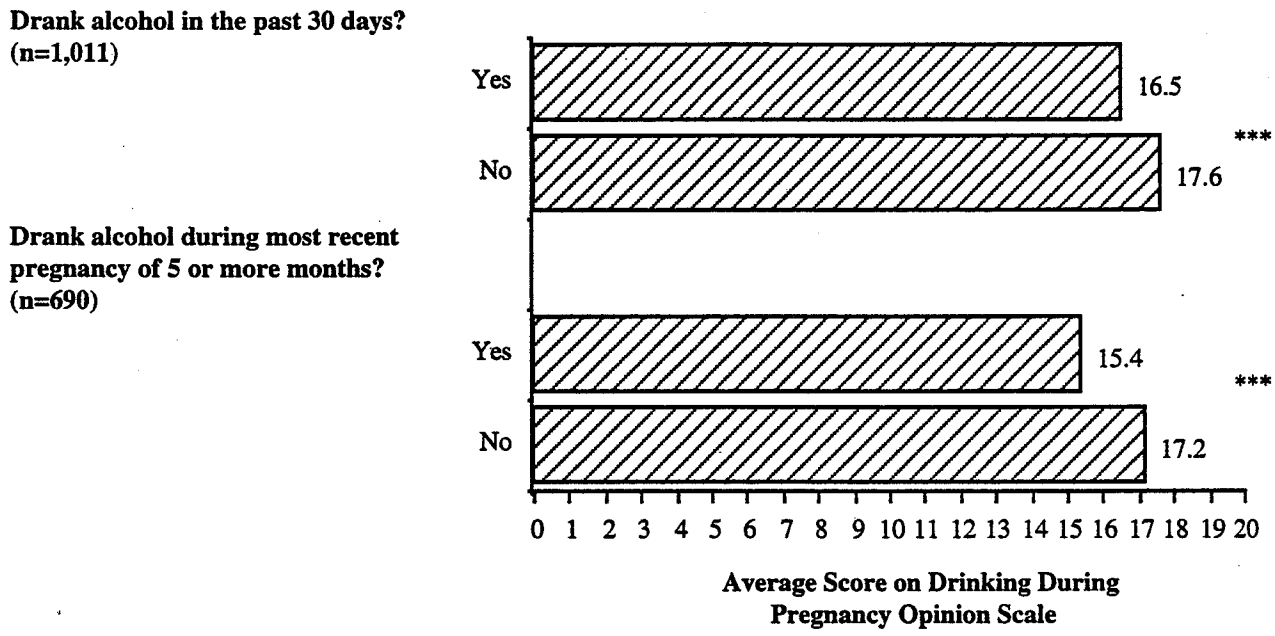
[a] Scores on the scale were obtained by summing the scores to each of the six items included in the scale. Each of the items was scored as follows: strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1.

Those who did not drink during their most recent pregnancy tended to score higher on the Drinking During Pregnancy Opinion Scale -- that is, they were somewhat more likely to endorse behaviors and warnings that discourage pregnant women from drinking. Similarly, women who were not current drinkers (i.e., did not drink alcohol in the past 30 days) tended to score higher on the scale (see Figure 8.5).

Scores on the Drinking During Pregnancy Opinion Scale differed slightly by age and marital status. Those under age 25 tended to have higher scores than those 25 and older -- mean scores of 17.9 and 16.7, respectively. Never married women tended to score higher than married/previously married women -- mean scores of 17.5 and 16.7, respectively. Hence, never married and younger women were slightly more likely to endorse behaviors and warnings that discourage pregnant women from drinking.

FIGURE 8.5
Drinking and Scores on the Drinking During Pregnancy Opinion Scale



*** $p < .001$.

SUMMARY

Behavior and Beliefs of Those Known to Respondent

- About seven in 10 women reported that almost none of the women they knew drank alcohol during pregnancy.
- Those who knew more women who drank during pregnancy were more likely to drink themselves during pregnancy.
- Less educated women, especially those who had not completed high school, were more likely to know women who drank while pregnant.
- Most women said that the people close to them (parents, spouse, family and friends) would be concerned if they drank during pregnancy.
- Women who reported that some people close to them would not be concerned if they drank during pregnancy were more likely to drink while pregnant.

Social Norms Regarding Drinking

- Women differed in their opinions about the degree to which people should engage in behaviors that discourage or prohibit pregnant women from drinking.
- Nearly two-thirds (65%) agreed that neither friends nor bartenders should serve alcoholic drinks to pregnant women.
- Most women agreed that they should warn a pregnant friend drinking at a bar not to drink, but only one-third said that they should so warn a pregnant stranger.
- Those women who did not drink during their most recent pregnancy or don't drink currently were more likely to endorse behaviors or warnings that discourage pregnant women from drinking.
- Never married and younger women (under age 25) were slightly more likely to endorse behaviors and warnings that discourage pregnant women from drinking.

CHAPTER IX: CONCLUSIONS AND IMPLICATIONS

OVERALL CONCLUSIONS

Women age 18 to 45 years old in Minnesota were surveyed regarding their use of alcohol and tobacco, and their beliefs about such use during pregnancy. This was a statewide telephone survey of a representative sample of 1,017 women of child-bearing age conducted in late 1993. The women surveyed tended to be married (65%), high school graduates (96%), and employed (81%). Most had contact with health care providers, 86 percent having visited a doctor or health care clinic within the past 12 months. Two-thirds of those surveyed had been pregnant at least once in their lives for five or more months.

Generally speaking, survey results indicate that awareness of the dangers of drinking alcohol and smoking tobacco during pregnancy is widespread among Minnesota women of child-bearing age. Evidence for this statement comes from the generally low use of these substances during pregnancy as reported by the women surveyed as well as their beliefs, and the beliefs of those around them, about the hazards of using these substances while pregnant. About one-quarter of the women reported drinking alcohol during their most recent pregnancy, and almost all of these women drank lightly, averaging about one drink per week or less. Only about 1 percent of the women surveyed did binge drinking (five or more drinks on an occasion) during their most recent pregnancy. Similarly, slightly less than one-quarter of the women reported smoking during pregnancy, and most who did smoke tended to smoke lightly -- i.e., 10 or fewer cigarettes per day. Only about 1 percent of the women reported smoking more than a pack of cigarettes per day during their most recent pregnancy. We should caution, however, that these are self-reported behaviors that may be subject to underreporting.

Further evidence for widespread awareness of the dangers of alcohol and substance use during pregnancy includes the high proportions of women who were drinking or smoking prior to pregnancy who reported reducing or stopping their use while pregnant. Ninety-three percent of those who were drinking prior to their most recent pregnancy reported reducing or stopping their drinking during pregnancy. Eighty percent of the smokers reported reducing or stopping their smoking during their most recent pregnancy. Many of these women reduced or stopped their drinking or smoking without being warned by their doctor or health care provider.

Results indicate a decline in alcohol and tobacco use during pregnancy in the past 10 years, suggesting that women's awareness of the hazards of using these substances while pregnant is rising. However, the decline in the use of alcohol during pregnancy may also be partially the result of a general decline in the prevalence of alcohol use among women of child-bearing age (Preliminary Estimates from the 1992 National Household Survey on Drug Abuse, U.S. Department of Health and Human Services, Public Health Service, June, 1993).

Most of the women surveyed believed that daily drinking, binge drinking, and daily cigarette smoking during pregnancy were extremely likely to cause harm to the newborn. Most of the women also said that the people around them (parents, spouse, family and friends) would be concerned if they drank during pregnancy.

Despite widespread awareness of the risks, survey findings suggest a couple of areas of potential concern regarding alcohol and tobacco use during pregnancy. First, alcohol use early in pregnancy before the woman realizes she is pregnant may be cause for concern, particularly in some groups. Among women who drank during pregnancy, one-third reported drinking more at the beginning of their pregnancies. Comments from some of the women indicated that this often occurred because women didn't reduce or stop drinking until after they realized they were pregnant, which might be several weeks after conception. For women who drank more heavily or did binge drinking, the risk to the fetus during the early stages of pregnancy might be significant. Younger women (under age 25) and those who hadn't completed high school were more likely to binge drink or drink more heavily. Among those groups, especially, it could be beneficial to promote the idea that one should stop drinking when one is trying to become pregnant, rather than waiting until after the pregnancy is confirmed.

With regard to cigarette smoking during pregnancy, over half of 18 to 20 year olds and those who had not completed high school smoked during pregnancy. Those who had not completed high school were a particularly high-risk group since they were not only more likely to smoke while pregnant, but tended to smoke more heavily as well. Hence, there appears to be a need for greater preventive efforts among teens and high school dropouts to reduce smoking during pregnancy.

IMPLICATIONS

Professional Education

- Most women of child-bearing age appear to be in regular contact with health care providers. Hence, the health care system is a potentially effective means of disseminating information or warnings regarding the dangers of alcohol or tobacco use while pregnant.

- The advice or counsel of the doctor appears to make a difference in reducing or stopping alcohol and tobacco use during pregnancy. Even though awareness of these issues is generally high, those who received specific advice from doctors not to drink or smoke during pregnancy tended to do these things less frequently.

- More efforts could be made by doctors or health care providers to advise pregnant women about the dangers of alcohol or tobacco use. Almost one-quarter of the women who had been pregnant in the past four years said their doctor didn't mention anything about drinking alcohol during pregnancy. Seventeen percent of those women who were regular smokers at some time in their lives and were pregnant in the past four years said the doctor didn't mention anything about smoking during their most recent pregnancy.

- Similarly, more efforts might be made to advise women who have never been pregnant about the dangers of alcohol and tobacco use during pregnancy. Only between 50 and 60 percent of these women said they had been so advised by their doctors.

- Health care professionals should be made aware of the groups at highest risk for using alcohol and tobacco during pregnancy. This awareness would enable them to make special efforts to reach these groups such as younger women and those with less education.

Public Information Strategies

- Awareness is high of the general message that alcohol (and tobacco) use during pregnancy can cause harm to the newborn. Hence, public information campaigns may want to concentrate on delivering more specific messages to a public that is already quite knowledgeable about the issue. Specific messages suggested by the survey findings are as follows:

    1) Drinking early in pregnancy can be harmful to the fetus. It could be beneficial (especially for heavier drinkers and binge drinkers) to stop drinking when planning or trying to become pregnant.

    2) Heavy drinking and heavy smoking during pregnancy cause harm to more newborns than cocaine use, although cocaine use is clearly dangerous too.

    3) Binge drinking can be especially dangerous while pregnant.

- Since most women are in regular contact with the health care system, this system is a promising avenue for dissemination of information on substance use and pregnancy.

- Most women of child-bearing age are in the labor force. Thus, providing information via the workplace or through employers is a potentially effective means, although some of the highest risk groups (teens, high school dropouts) may not be reached well using this approach.

- Signs in bars, restaurants and liquor stores warning pregnant women not to drink are only seen by slightly over one-third of the women of child-bearing age. To be a more effective public information vehicle, these signs may need to be more widely used and more prominently displayed.

Prevention Programs

- Programs to prevent alcohol/tobacco use during pregnancy need to begin early. Drinking and smoking are common during the teen years. Among 18 to 20 year old women, six in 10 were currently drinking and four in 10 were currently smoking. The age at which women begin drinking appears to be decreasing.

- The survey findings suggest that advertisers of alcohol and tobacco products are successful in making them appealing to young women. Prevention efforts might seek to discourage advertisers from targeting young women (or at least teens) or seek to counter the messages of such advertising.

- A priority for prevention programs should be high school dropouts. Although these women may be difficult to reach, they are a high-risk group for substance use during pregnancy. Non-high school completers were more likely to smoke during pregnancy, and if they did, to smoke more heavily. Half of those who had not completed high school were current binge drinkers and were more likely to have women around them who drank during their pregnancies.

Future Research

- Further study of high-risk groups for alcohol/tobacco use during pregnancy (e.g., teens, high school dropouts) should be a focus of future research efforts. For prevention efforts to succeed with these groups we need more information on such questions as:

    1) How can these groups be reached by prevention programs or campaigns?

    2) What are the factors that cause them to use alcohol or tobacco, particularly during pregnancy?

    3) What prevention approaches and what messages are likely to be successful with these groups?

- More study of alcohol/tobacco use patterns during pregnancy in racial or ethnic minority groups may be helpful to prevention efforts. The current study, being a general survey of women of child-bearing age across the state, did not address this potentially important area.

APPENDIX A

Description of the Minnesota Department of Health Fetal Alcohol Syndrome, Fetal Alcohol Effects, and Drug-Exposed Infants Prevention Program.

DESCRIPTION OF THE MINNESOTA DEPARTMENT OF HEALTH FETAL ALCOHOL SYNDROME, FETAL ALCOHOL EFFECTS AND DRUG-EXPOSED INFANTS PREVENTION PROGRAM

The Crime Bill of 1992 included an appropriation to the Chemical Abuse Prevention Resource Council (CAPRC) which is an advisory council to the Governor to plan and implement a State Alcohol and Other Drug Abuse Strategy. This appropriation was used to address several priorities identified by the CAPRC, including the prevention of fetal alcohol syndrome (FAS), fetal alcohol effects (FAE) and drug-exposed infants.

The legislation which established the program requires that activities be conducted in three broad areas:

1) Research focusing on: a) the identification of the best methods to use to determine the incidence and prevalence of FAS/FAE in Minnesota, and b) the identification of the best methods to use to prevent FAS/FAE and drug-exposed infants in Minnesota.

2) Professional education for health professionals and human services providers.

3) Conduct a statewide media campaign.

The Minnesota Department of Health has worked in collaboration with the Office of Drug Policy and Violence Prevention, the Minnesota Department of Education, the Minnesota Department of Human Services and Minnesota Healthy Roots: A Coalition for the Prevention of Maternal Substance Abuse to develop a workplan for the program and to conduct its activities. These activities are described below.

Research

1. A literature review and an annotated bibliography that examine FAS/FAE related research on: 1) alcohol use during pregnancy, 2) the epidemiology of alcohol-related birth defects (ARBD), including FAS and FAE, 3) current knowledge of the effects of alcohol on the developing fetus, and 4) recent trends in the surveillance and strategies in the prevention of the disease and treatment for pregnant women abusing alcohol.

2. An update of the 1985 report published by the Minnesota Department of Health, "Review and Cost of Alcohol Abuse in Minnesota." This report examines the direct and indirect costs associated with alcohol use in Minnesota including health care, FAS/FAE, injuries, homicides and property damage.

3. A statewide telephone survey of women of child-bearing ages (18-45) to examine their knowledge, attitudes, beliefs about and use of alcohol during pregnancy, and the kinds of support they may or may not have to make good decisions about alcohol use during pregnancy.

4. Five working conferences for health care, education and social services providers held around the state to solicit input on surveillance, or data collection, strategies for FAS/FAE. This input will yield the best methods of collecting information on the incidence and prevalence of FAS/FAE in Minnesota. During the next year, the design of the statewide data collection strategy will be completed.

5. In the next year, research activities will focus on determining which prevention methods are most effective for FAS/FAE and which are in use in Minnesota.

Professional Education

1. The five working conferences mentioned above also address this goal. In addition to providing input into data collection strategies, the conferences provided education of FAS/FAE, and training on public health data collection, its importance and implications for local and statewide programming, evaluation, research and policy development.

2. Conduct focus groups, individual interviews and surveys of health care professionals (Obstetricians, Pediatricians, Family Practice MDs, midwives, clinical nurses, public health nurses, etc.) to assess training needs. This project will determine their perceived roles in the prevention of FAS/FAE, their levels of interest in FAS/FAE, what they want to learn about FAS/FAE and how they'd like to learn it (journal articles, Grand Rounds, conferences, academic preparation, etc.). Future trainings and conferences will be planned based on this assessment.

3. Trainings and provision of technical assistance will be conducted by program staff as requested.

Statewide Media

1. The identification of a target group for the campaign: 18 - 24 year olds involved in post-secondary education in Minnesota.

2. Conduct focus groups, informal discussion groups and individual interviews with representatives of the target group, bar owners and administrators and faculty of post-secondary institutions in Minnesota to identify appropriate prevention messages, and channels of communication for the media campaign.

3. In the next year, media spots and/or educational materials will be developed and the campaign will be conducted.

APPENDIX B

SURVEY INSTRUMENT

MINNESOTA WOMEN'S HEALTH SURVEY

Hello, my name is _____ and I'm calling from the Wilder Research Center in St. Paul. The Minnesota Department of Health has asked us to speak with women between the ages of 18 and 45 to find out about their access to health care and other issues for women of child bearing ages.

A. How many women between the ages of 18 and 45 live in this household?

a. 0→→→ **(DISCONTINUE INTERVIEW, RECORD AS INELIGIBLE)**

b. 1

c. More than one→→→ ____ **(RECORD NUMBER)**

I'd like to speak to the woman between those ages who celebrated her birthday most recently.

(CONTINUE WITH THIS WOMAN IF AVAILABLE, OR ARRANGE AN APPOINTMENT)

B. Is the area in which you live a city, town, suburb, or open country?

a. city/town/suburb→→→ What is the name of your **(ANSWER FROM a.)**?

_____ _____
(RECORD NAME) **(CODE)**

b. open country

C. In what county do you live?

_____ (DISCONTINUE IF NOT NEEDED FOR QUOTA) _____
(RECORD COUNTY NAME) **(CODE)**

Your household was selected at random to be included in this survey. We're interested in your opinions and awareness of health care issues concerning women of child bearing ages. The results of this survey will be used to help health care and other service providers better inform women. It's confidential, no one will know that you participated. If there are any questions you prefer not to answer, just tell me and we'll skip over them.

My first question concerns health care and your access to it.

Section I. Health Care

1. What kind of health care insurance do you have for yourself? Do you have:
   1. private health insurance, including HMO coverage,
   2. Medical assistance,
   3. Minnesota Care, or
   4. no health insurance coverage?
   7. Refused
   8. Don't know

2. During the last 12 months, did you visit a doctor or health care clinic for any reason related to your own health?
   1. Yes
   2. No→→→
   7. Refused
   8. Don't know

   2a. How long has it been since you last visited a doctor or health care clinic for your own health:
      1. 1-2 years,
      2. 3-4 years, or
      3. 5 or more years ago?
      7. Refused
      8. Don't know
      9. NA

3. Was there a time during the last 12 months when you needed to see a doctor, but could not due to the cost?
   1. Yes
   2. No
   7. Refused
   8. Don't know

4. A Pap smear is a test for cancer of the cervix. Have you ever had a Pap smear?
   1. Yes→→→
   2. No
   7. Refused
   8. Don't know

   4a. How long has it been since you had your last Pap smear:
      1. less than one year ago,
      2. 1-2 years,
      3. 3-4 years, or
      4. 5 or more years ago?
      7. Refused
      8. Don't know
      9. NA

Section II. Health Habits

The next few questions are about some of your health habits.

5. About how old were you when you had your first drink of alcohol? This does not include sips given to you as a child, and it does not include alcohol used in religious services.

   _____ years old

   -7. Refused

   -8. Don't know

   -9. Never had a drink of alcohol →→→→ **SKIP TO Q.11**

6. When was the most recent time you had an alcoholic beverage such as beer, wine, wine cooler or liquor? Was it:

   1. within the past 30 days,
   2. within the past 6 months but more than a month ago,
   3. six months to a year ago
   4. more than a year to 3 years ago, or
   5. more than 3 years ago?

   →→→ **SKIP TO Q.10**

   7. Refused
   8. Don't know
   9. NA

7. During the past 30 days, on about how many different days did you have one or more drinks?

   _____ number of days

   -7. Refused

   -8. Don't know

   -9. NA

8. A drink is one can or bottle of beer, one glass of wine, one can or bottle of wine cooler, one cocktail, or a shot of liquor. On the days that you drank during the past 30 days about how many drinks did you usually have a day on the average?

   _____ number of drinks

   -7. Refused

   -8. Don't know

   -9. NA

9. Considering all types of alcoholic beverages, how many times in the past 30 days did you have five or more drinks on an occasion?

   _____ number of times

   -7. Refused

   -8. Don't know

   -9. NA

10. Has there ever been a time in the past when you drank more alcohol, on average, than you do now?

1. Yes→→→
2 No
7. Refused
8. Don't know
9. NA

10a. Was this:

1. less than one year ago,
2. 1-2 years,
3. 3-4 years,
4. 5-10 years, or
5. more than 10 years ago?
7. Refused
8. Don't know
9. NA

10b. Was there any special circumstance or event that ever caused you to reduce the amount you were drinking?

1. Yes→→ What was this? _____
2. No _____
7. Refused _____
8. Don't know
9. NA

11. Have you ever been treated in an alcohol or drug treatment program?

1. Yes→→→
2. No
7. Refused
8. Don't know
9. NA

11a. Was this:

1. less than 1 year ago,
2. 1-2 years,
3. 3-4 years,
4. 5-10 years, or
5. more than 10 years ago?
7. Refused
8. Don't know
9. NA

IF TREATED MORE THAN ONCE, CODE THE MOST RECENT TIME

12. Have you ever smoked any cigarettes?

1. Yes→→→→

12a. Have you smoked 100 cigarettes in your life?
   1. Yes
   2. No
   7. Refused
   8. Don't know
   9. NA

2. No→→→→ **GO TO SECTION III BELOW**
7. Refused
8. Don't know

13. Have you smoked any cigarettes in the past month?
   1. Yes
   2. No→→→→→ **GO TO SECTION III BELOW**
   7. Refused
   8. Don't know

14. On the average, how many cigarettes a day do you smoke?
   _____ number of cigarettes
   -7. Refused
   -8. Don't know
   -9. NA

Section III. Pregnancy and Health Habits

Now I would like to ask you about any pregnancies you have had.

15. Have you ever had a pregnancy that lasted at least 5 months?

1. Yes→→→

15a. Are you currently 5 or more months pregnant?
   1. Yes→→→ **SKIP TO Q17**
   2. No
   7. Refused
   8. Don't know
   9. NA

2. No→→→ **GO TO SECTION IV, PAGE 11.**

16. In what year did your most recent pregnancy of 5 or more months end?

19 ___ ___

-7. Refused

-8. Don't know

-9. NA

17. How many times have you had a pregnancy that lasted at least 5 months?

_____ number of times

-7. Refused

-8. Don't know

-9. NA

The next few questions are about your most recent pregnancy of 5 or more months. (**READ IF APPLICABLE:** This would be your current pregnancy if you are 5 or more months pregnant.)

18. How far along in the pregnancy were you when you first visited a doctor about the pregnancy? Was it:

1. within the first 3 months,
2. 4-6 months, →→
3. more than 6 months,
4. or didn't (haven't) you visited a doctor during the pregnancy?
7. Refused
8. Don't know
9. NA

18a. About how many times did you visit the doctor for the pregnancy? Was it:

1. 1 - 3 times
2. 4 - 8,
3. 9 - 14, or
4. 15 or more times?
7. Refused
8. Don't know
9. NA

(IF RESPONDENT HAS EVER SMOKED CIGARETTES (SEE Q12), ASK Q19-21. OTHERWISE SKIP TO INSTRUCTIONS BEFORE Q22.)

19. Did you smoke any cigarettes during the pregnancy?

1. Yes→→→→
2. No
7. Refused
8. Don't know
9. NA

19a. On the average, during the pregnancy, about how many cigarettes did you smoke each day?

_____ number of cigarettes

-7. Refused

-8. Don't know

-9. NA

20. When you realized you were pregnant, did you change how many cigarettes you were smoking?

1. Yes→→→

20a. In what way did you change your cigarette smoking:

1. decreased,
2. stopped,
3. started, or
4. increased?
7. Refused
8. Don't know
9. NA

2. No→→→

7. Refused
8. Don't know
9. NA

20b. Did you change prior to the pregnancy because you were planning the pregnancy?

1. Yes→→→
2. No
7. Refused
8. Don't know
9. NA

20c. In what way did you change your cigarette smoking:

1. decreased,
2. stopped,
3. started, or
4. increased?
7. Refused
8. Don't know
9. NA

21. **(IF NOT CURRENTLY PREGNANT 5 OR MORE MONTHS, ASK:)** After your pregnancy ended, did you change how many cigarettes you were smoking?

1. Yes→→→
2. No
7. Refused
8. Don't know
9. NA

21a. In what way did your cigarette smoking change:

1. decreased,
2. stopped,
3. started, or
4. increased?
7. Refused
8. Don't know
9. NA

21b. About how many weeks after the pregnancy ended did you make this change?

_____ number of weeks

-7. Refused
-8. Don't know
-9. NA

IF RESPONDENT HAS EVER HAD AN ALCOHOLIC DRINK (SEE Q5) ASK Q22. OTHERWISE GO TO SECTION IV, PAGE 11.

22. Did you have any alcoholic drinks during the pregnancy?

1. Yes→→→

22a. On the average, during the pregnancy, how many days per month did you have one or more drinks?

_____ number of days

-7. Refused
-8. Don't know
-9. NA

2. No→→→ **SKIP TO Q26**
7. Refused
8. Don't know
9. NA

23. On the days you drank during the pregnancy, about how many drinks did you usually have a day on the average?

_____ number of drinks

7. Refused
8. Don't know
9. NA

24. Considering all types of alcoholic beverages, how many times during the pregnancy did you have five or more drinks on an occasion?

_____ number of times

-7. Refused

-8. Don't know

-9. NA

25. Did you drink more at the beginning of the pregnancy, in the middle, towards the end of the pregnancy, or the same throughout?

1. Beginning
2. Middle
3. End
4. Same throughout
7. Refused
8. Don't know
9. NA

26. When you realized you were pregnant, did you change how much you were drinking?

1. Yes→→→

26a. In what way did your drinking change:

1. decreased,
2. stopped,
3. started, or
4. increased?
7. Refused
8. Don't know
9. NA

2. No→→→

7. Refused
8. Don't know
9. NA

26b. Did you change prior to the pregnancy because you were planning the pregnancy?

1. Yes→→
2. No
7. Refused
8. Don't know
9. NA

26c. In what way did your drinking change:

1. decreased
2. stopped,
3. started,
4. or increased?
7. Refused
8. Don't know
9. NA

27. **(IF NOT CURRENTLY PREGNANT 5 OR MORE MONTHS, ASK:)** After your pregnancy ended, did you change how much you were drinking?

1. Yes→→→
2. No
7. Refused
8. Don't know
9. NA

27a. In what way did your drinking change:

1. decreased,
2. stopped,
3. started, or
4. increased?
7. Refused
8. Don't know
9. NA

27b. About how many weeks after the pregnancy did you make this change?

_____ number of weeks

-7. Refused
-8. Don't know
-9. NA

Section IV. Knowledge and Beliefs

28. Next, I'm going to read you a list of things that may or may not cause harm to babies before they are born. Please tell me how likely you think it is that each one will cause harm to the baby on a scale of 1 to 5, where 1 means not at all likely and 5 means extremely likely.

How likely is it that _____ will cause harm to the baby:

	Not at all Likely				Extremely Likely	Refused	Don't Know
a. Occasional use of crack or cocaine by a woman, say once or twice during pregnancy.	1	2	3	4	5	7	8
b. Regular use of crack or cocaine.	1	2	3	4	5	7	8
c. Occasional smoking of a cigarette by a pregnant woman.	1	2	3	4	5	7	8
d. Daily cigarette smoking.	1	2	3	4	5	7	8
e. Occasional drinking of alcohol by a pregnant woman.	1	2	3	4	5	7	8
f. Daily drinking of one or two drinks per day.	1	2	3	4	5	7	8
g. Daily drinking of 3 or more drinks per day.	1	2	3	4	5	7	8
h. Drinking 5 or more alcoholic drinks on any one occasion.	1	2	3	4	5	7	8

i. **IF ANSWERED 3, 4, or 5 TO h, ASK:)**
Would drinking 5 or more drinks in a row be more likely to do harm if it occurred:

1. early in the pregnancy,
2. around the middle of the pregnancy,
3. late in the pregnancy, or
4. would the effect be the same regardless of when in the pregnancy this happened?
7. Refused
8. Don't know
9. NA

29. Which of the following is causing harm to the largest number of newborns in the United States today:

1. heavy cigarette smoking during pregnancy,
2. heavy alcohol use during pregnancy, or
3. crack or cocaine use during pregnancy?
7. Refused
8. Don't know

30. Would harm to the newborn be more likely if a pregnant woman drank beer, wine or liquor, or would the effects be the same for all of these?

1. Beer
2. Wine
3. Liquor
4. Same for all
5. **(DO NOT READ)** Some drinks are more harmful than others.
7. Refused
8. Don't know

Section V. Social Norms and Behaviors

31. Of the women that you know, how many drink alcohol at least occasionally while they are pregnant? Would you say:

1. almost all of them,
2. more than half,
3. about half,
4. less than half, or
5. almost none of them?
7. Refused
8. Don't know

32. Of the women that you know well, such as friends, co-workers, and relatives, how many of them drink alcohol at least occasionally while they are pregnant? Would you say:

1. almost all of them,
2. more than half,
3. about half,
4. less than half, or
5. almost none of them?
7. Refused
8. Don't know

33. Next, I would like to ask you whether other people around you might be concerned about your drinking alcohol if you were pregnant. First, would your mother be concerned?

	Yes	No	Some yes, Some no	Refused	Don't Know	Not Applicable (not living or don't have)
a. your mother?	1	2		7	8	9
b. your father?	1	2		7	8	9
c. your spouse or partner, if you have one?	1	2		7	8	9
d. other family members you are close to?	1	2	3	7	8	9
e. your close friends?	1	2	3	7	8	9

34. Please tell me whether you strongly agree, agree, disagree, or strongly disagree with the following statements.

	Strongly Agree	Agree	Disagree	Strongly Disagree	Refused	Don't Know
a. A bartender should refuse to serve alcohol to a woman who is obviously pregnant.	1	2	3	4	7	8
b. When a person is out with a friend who is pregnant, that person should also avoid drinking alcohol.	1	2	3	4	7	8
c. When a person is offering alcoholic drinks to a group of friends, that person should only offer soft drinks to a friend who is pregnant.	1	2	3	4	7	8
d. When you see an obviously pregnant woman drinking alcohol at a bar who is not someone you know, you should warn her not to drink.	1	2	3	4	7	8

↓

d1. Would you warn her? 1. Yes 2. No 3. Maybe 7. Ref 8. DK 9. NA

e. When you see an obviously pregnant friend drinking alcohol at a bar, you should warn her not to drink.	1	2	3	4	7	8

↓

e1. Would you warn her? 1. Yes 2. No 3. Maybe 7. Ref 8. DK 9. NA

f. Bars and restaurants should be required to post signs warning pregnant women not to drink.	1	2	3	4	7	8
g. It is sometimes okay for a woman who is not pregnant to get drunk.	1	2	3	4	7	8
h. It is okay for a woman who is not pregnant to have one or two alcoholic drinks at a party.	1	2	3	4	7	8

Section VI. Warnings

IF RESPONDENT HAS EVER BEEN PREGNANT FOR 5 OR MORE MONTHS, ASK Q.35 AND 36. OTHERWISE, SKIP TO Q37.

35. During your most recent pregnancy of 5 or more months, did your doctor or other health care provider tell you:

1. not to drink alcohol at all,
2. to drink only lightly or in moderation,
3. that it would be okay to drink, or

→→

4. did s/he not mention drinking at all?
5. **(DO NOT READ)** Doctor asked about drinking, but didn't warn her because respondent doesn't drink.
7. Refused
8. Don't know
9. NA

35a. How many times did s/he tell you this?

_____ number of times

-7. Refused
-8. Don't know
-9. NA

36. During your most recent pregnancy of 5 or more months, did your doctor or other health care provider tell you:

1. not to smoke any cigarettes at all,
2. to smoke only lightly or in occasionally,
3. that it would be okay to smoke, or

→→

4. did s/he not mention smoking at all?
5. **(DO NOT READ)** Doctor asked about smoking, but didn't warn her because respondent doesn't smoke.
7. Refused
8. Don't know
9. NA

36a. How many times did s/he tell you this?

_____ number of times

-7. Refused
-8. Don't know
-9. NA

SKIP TO Q.39.

IF THE RESPONDENT HAS NEVER BEEN PREGNANT ASK:

37. Did a doctor or health care provider ever mention to you that you should avoid alcohol if you became pregnant or were planning to become pregnant?
    1. Yes
    2. No
    7. Refused
    8. Don't know
    9. NA

38. Did a doctor or health care provider ever mention to you that you should avoid smoking if you became pregnant or were planning to become pregnant?
    1. Yes
    2. No
    7. Refused
    8. Don't know
    9. NA

39. Have you ever seen messages on bottles of beer, wine or liquor warning pregnant women not to drink?

1. Yes
2. No
7. Refused
8. Don't know

40. Have you ever seen signs in bars, restaurants or liquor stores warning pregnant women not to drink?

1. Yes
2. No
7. Refused
8. Don't know

Section VII. Demographics

Finally, in order to help our staff interpret these results, I have just a few questions for you.

41. What is your age?

_____ years old

IF WON'T GIVE AGE, ASK:
What age group are you in:

1. 18-24,
2. 25-29,
3. 30-34,
4. 35-39, or
5. 40-45?
7. Refused

42. Is your marital status right now:

1. married,
2. separated (legally or otherwise),
3. divorced,
4. widowed, or
5. never married?
7. Refused

43. How much schooling have you had?

1. Less than high school graduation
2. High school diploma or GED
3. Vocational or business school after high school graduation
4. Some college
5. College graduate
6. Advanced degree
7. Refused

44. Are you currently employed (including self-employment)?

1. Yes→→→
2. No

44a. Do you work:

1. full-time (35 or more hours per week),
2. part time (less than 35 hours per week), or
3. in a temporary or seasonal position?
7. Refused
9. NA

44b. What kind of job do you have? **(PROBE: What is your job title? What do you do on your job?) (IF MORE THAN ONE JOB, ANSWER FOR MAIN JOB)**

_____

_____

_____

44c. Which of the following best describes you:

1. homemaker,
2. student,
3. disabled, or
4. not currently employed?→

7. Refused
8. Don't know
9. NA

44d. What was your most recent job? **(PROBE:** What was your job title? What did you do on your job?)

_____

_____

Thank you very much for participating in the survey. I appreciate your taking the time to participate and have enjoyed talking with you.

APPENDIX C

STUDY METHODS

STUDY METHODS

SURVEY SAMPLE

Sampling Design

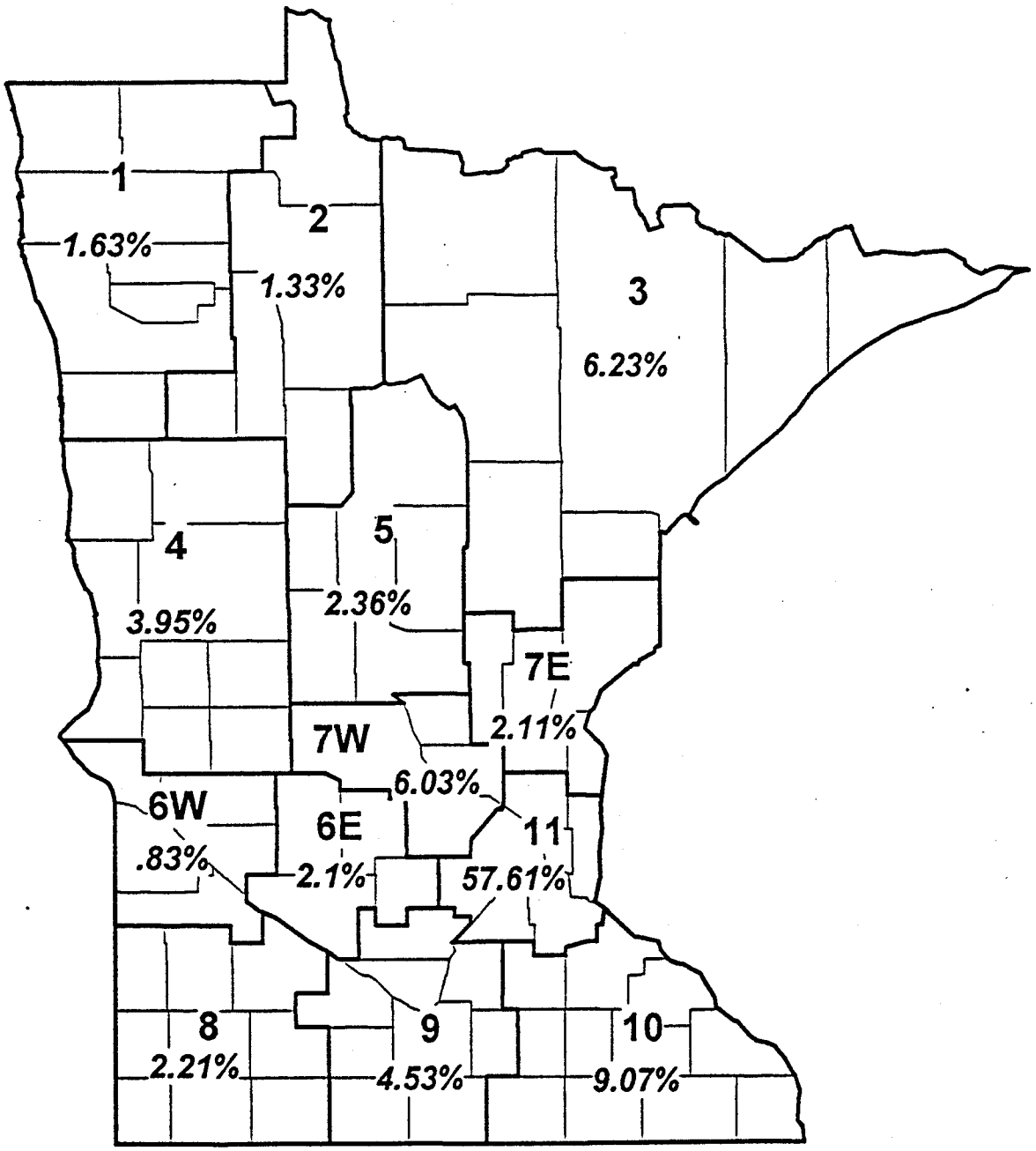
The aim of the sampling design was to obtain a representative sample of women of child-bearing age (i.e., 18 to 45 years old) residing in Minnesota in households with telephones. Furthermore, the sample needed to be geographically representative of the state and of sufficient size such that figures derived from the survey would be reasonably precise (i.e., have a confidence interval of 5 percent).

To achieve these goals, a geographically stratified random sample of households with telephones was used. The total sample size was set at 1,000. One woman age 18 to 45 was surveyed in each randomly selected household in which one or more women in this age range resided.

The sampling design was implemented by first determining the number of women age 18 to 45 who resided in each of the 13 development regions of the state, and what percentage this number represented in each region of the total state population of women in this age range. The regions are clusters of counties that have been established for planning and development purposes. Figure C.1 shows the percentage of the total state population of 18 to 45 year old women that reside in each region according to the 1990 Census. By multiplying these percentages (and moving the decimal point two places to the left) by the sample size (i.e., 1,000) in each region, the number of 18 to 45 year old women that needed to be surveyed in each region was determined. For example, the number needed in Region 3 was 62 (.0623 x 1000 = 62). Because Region 11 contains such a large proportion of the total state population of 18 to 45 year old women (58%), we substratified this region into three parts (Hennepin, Ramsey, and the other five remaining counties) for purposes of sampling.

Next, a random digit sample of telephone numbers was purchased from Survey Sampling, Inc., of Fairfield, Connecticut. The sample of telephone numbers was divided into separate subsamples for each region, which are made up of counties. The sample provided by Survey Sampling is drawn in such a way as to be geographically representative of telephone households. This is accomplished by stratifying the sample of telephone numbers in proportion to each county's share of telephone households in the state. Within each county, geographic representativeness is approximated by systematically sampling from among all working blocks of numbers (fourth and fifth digits) of all working telephone exchanges (first three digits) assigned to a county. Within each selected block, the final two digits of the telephone number are randomly chosen. This approach to drawing the telephone numbers, plus our stratification of the sample by region according to the proportion of the state's 18 to 45 year old women living in each region, helped to

FIGURE C.1
Women Age 18 to 45 by Region
As a Percentage of Women Age 18 to 45 in the State



Source: 1990 Census, STF1

ensure a geographically representative sample. It also allows both households with listed telephone numbers and those with unlisted numbers to be sampled.

After determining the number we needed to survey in each region, and having obtained the list of randomly selected telephone numbers for each region, the next step in the sampling process was to identify eligible survey respondents at the households called. Interviewers established whether there was a woman age 18 to 45 living in the household. If there was one, the interviewer would speak to this person, verify the county of residence, provide a brief introduction to the survey, invite the woman to participate, and proceed with the interview with her consent. If there were two or more women age 18 to 45 in the household, we randomly selected one to be surveyed using the next (or most recent) birthday method of respondent selection (Salmon, C.T. and Nichols, J.S. Public Opinion Quarterly 47:270-276, 1983). This is an efficient and unbiased way of selecting the respondent. The interviewer simply asked to speak to the 18 to 45 year old woman in the household who had the most recent birthday. About 90 percent of the households containing 18 to 45 year old women have only one woman in this age range (based on 1990 Census information).

Sample Outcome

Table C.1 indicates the goal for number of interviews in each region (based on Figure C.1) and the number actually completed. The goal is based on the proportion of the state's 18 to 45 year old women who reside in each region as previously described. The goal was met in each region, and sometimes it was slightly exceeded. The total number of interviews actually done across all regions was 1,017, or 17 more than the goal.

The reason we went over the number needed in some regions is because telephone exchanges cross county lines, and therefore, one cannot exactly determine the county in which a household is located by the telephone number (and hence, also what region it is in). This fact made it difficult to obtain precisely the number of interviews needed in a region, since some completed interviews were later assigned to a different region (based on information obtained on the location of the household during the interview) from that originally assigned based on the telephone number. We decided to keep these interviews in the sample since there are not enough to seriously compromise the geographic representativeness of the sample.

Table C.2 lists the outcomes for each of the telephone numbers selected. A total of 4,266 telephone numbers were called to obtain 1,017 completed interviews. Other outcomes included those eligible women who refused to participate. Those who initially refused were usually called back and asked again if they would consider participating. This sometimes resulted in their agreeing to be interviewed. Initial refusals frequently occur because the respondent misunderstands the purpose of the call or is caught at a bad time. Nevertheless, 166 ultimately refused to be surveyed.

TABLE C.1
Number of Study Interviews Completed by Development Region: Goal and Actual

Sampling Area		Number of Interviews Completed		
		Goal[a]	Actual	Difference[b]
Region 1		16	17	+1
Region 2		13	13	0
Region 3		62	62	0
Region 4		40	44	+4
Region 5		24	24	0
Region 6E		21	21	0
Region 6W		8	8	0
Region 7E		21	21	0
Region 7W		61	63	+2
Region 8		22	22	0
Region 9		45	45	0
Region 10		91	95	+4
Region 11:	Hennepin County	264	264	0
	Ramsey County	121	122	+1
	Other Counties	191	196	+5
		1000	1017	+17

a The goal is based on the proportion of the state's 18 to 45 year old women who live in the sampling area, using the 1990 Census.

b Difference = Actual - Goal.

TABLE C.2
Outcome for Each Telephone Number Attempted and Survey Response Rate

Outcome		
I.	Completed interview	1017
II.	Refusal	166
III.	Communication barrier[a]	19
IV.	Unable to contact[b]	228
V.	Ineligible[c]	1518
VI.	Not a household number	1318
	Total	4266
	RESPONSE RATE[d]	80%

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a Refers to contact with households where the interview could not be completed due to language or physical barriers to communication. In some of these households there may not have been an eligible respondent, but this could not be determined due to communication barriers.

b We were unable to establish contact with anyone at the number despite multiple attempts at different times during the day and on different days of the week.

c There was no woman between the ages of 18 and 45 living in the household.

d The response rate was calculated as follows, using the Roman numerals assigned to each category

$$\text{Response rate} = \frac{\text{I}}{\text{I} + \text{II} + \text{III} + \text{IV (partial)}^*} = \frac{1017}{1017 + 166 + 19 + 68} = \frac{1017}{1270} = .801$$

* The "unable to contact" category is likely to contain an unknown number of households with eligible respondents. To establish how many this might be we used our experience with the telephone numbers where we were able to establish contact.

$$\text{Eligible households} + \text{Total contacts made} = \frac{\text{I} + \text{II} + \text{III}}{\text{I} + \text{II} + \text{III} + \text{V} + \text{VI}} = \frac{1017 + 166 + 19}{1017 + 166 + 19 + 1518 + 1318} = \frac{1202}{4038} = .298$$

Estimated eligible households in the "unable to contact" category = .298 x 228 = 68

Of the 19 communication barriers, 11 were due to hearing problems, two to confusion, and six to language (two Laotian, one Korean, one Chinese, and two undetermined). Some of these households probably did not have an eligible respondent, but this could not be determined. All 19 households were classified as eligible for purposes of calculating the response rate.

Several interviews were conducted in Hmong. We were unable to establish contact with a person for 228 telephone numbers despite multiple attempts on different days of the week and at different times during the day. Sometimes all we could get was an answering machine. Many of the households contacted did not have an eligible respondent. We also encountered quite a few non-household or business numbers.

The response rate achieved was 80 percent. The details of how the response rate was calculated are provided in Table C.2. Essentially, the response rate (proportion) is determined by dividing the number of completed interviews by the number of potential interviews. The number of potential interviews includes completed interviews, refusals, communication barriers and a proportion of those we were unable to contact. This latter proportion is based on an estimate of how many of these telephone numbers would have yielded eligible households had we been able to establish contact. The estimate was derived from our experience with households where we did establish contact (see Table C.2).

Comparison of Sample Characteristics to 1990 Census

The demographic characteristics of women of child-bearing age as found in our telephone survey were compared to those obtained in the 1990 Census to gain a better understanding of the representativeness of our survey sample. Table C.3 shows the distributions for age, marital status and education as found in the survey and in the census.

Results indicate that our sample has lower proportions of younger women (especially age 18 to 20) and higher proportions of older women (age 35 to 45) than the census. This may be partially due to changes in the age structure of the population in the nearly four years since the census was conducted. That is, the aging of the baby boom generation in these four years would be expected to increase the proportion of women age 35 and older somewhat and correspondingly reduce the proportion of younger women to some degree.

This is not likely to account for the entire age difference between the survey and the census, however. Other reasons that may account for part of the difference are that younger women (18 to 20 year olds, in particular): 1) may be less likely to have a telephone if they live on their own, 2) may be more likely to live in households with more than one woman of child-bearing age (thus, having a reduced probability of being selected for the sample), and 3) may be harder to contact or more likely to refuse to participate in the survey.

TABLE C.3
Demographic Characteristics of Women of Child-Bearing Age in Minnesota: Telephone Survey and 1990 Census* Figures

Characteristic		Telephone Survey (N=1017)	1990 Census*
Age	18 - 20	4%	10%
	21 - 24	11%	13%
	25 - 34	40%	41%
	35 - 45	45%	37%
Marital Status	Married	65%	58%
	Separated	2%	2%
	Divorced	10%	9%
	Widowed	1%	1%
	Never Married	22%	31%
Education (highest level attained)			
	Less than high school graduation	4%	6%
	High school graduate/GED	36%	31%
	Some college or more	60%	63%

* Based on 1990 Public Use Micro Sample.

Comparisons to the census figures also indicate that never married women are somewhat underrepresented in the sample while married women are somewhat overrepresented. These differences are no doubt related to the fact that the study sample has fewer younger women and more older women, proportionately, compared to the census as just described.

The study sample and the census figures are quite similar regarding the proportions of women at different educational levels. The distribution of occupations for women in the survey sample was also similar to the census. It appeared, however, that professional/technical occupations were slightly overrepresented in the sample and sales occupations were slightly underrepresented.

In sum, the study sample has somewhat lower proportions of younger women and higher proportions of older women than the 1990 Census. This difference may be partially due to changes in the age structure since the 1990 Census was conducted. However, it seems likely that younger women are underrepresented, at least to a slight degree, in the study sample. This underrepresentation should be kept in mind as it may affect some of the figures derived from the sample that are age-related (e.g., current rate of binge drinking among women of child-bearing age).

It is also important to remember that because this is a household-based telephone survey, women of child-bearing age living in households and other places (e.g., institutions, homeless shelters) without telephones are excluded from the survey. Very few households in Minnesota are without telephones, however. According to the 1990 Census, 98 percent of the households in Minnesota have telephones.

How to Interpret Sample Figures

Because the survey was conducted on a sample of Minnesota women of child-bearing age, the figures reported from the survey are estimates of the true population figures and, therefore, subject to sampling error. In general, the larger the sample size, assuming random sampling, the greater the accuracy of the estimates of population figures derived from the sample. With the sample size of 1,017, we calculated the 95 percent confidence interval for a range of percentages derived from the sample. The confidence interval indicates the range in which the true population figure is likely to fall 95 percent of the time given the sample figure. Confidence intervals are shown below.

Sample Percentage	95 Percent Confidence Interval
10%	±2%
30%	±3%
50%	±3%
70%	±3%
90%	±2%

To illustrate, survey results indicated that 27 percent of women age 18 to 45 smoked cigarettes in the past month. We can be 95 percent confident that the true figure is between 24 and 30 percent. It should be noted that these confidence intervals assume random sampling, no biases introduced by response rates, and the data being collected reliably. While these assumptions are not met perfectly by the survey, we are likely close enough to meeting them that these intervals are reasonable estimates of sampling error. When figures are derived from subgroups of the total sample (e.g., women age 18 to 24), the sampling error, and therefore, the confidence interval, generally increases.

It should be noted that the validity of the responses is another matter given the sensitive nature of some of the survey questions. For example, underreporting of alcohol consumption is typical in surveys of this type because of the social undesirability of particular responses. Reporting alcohol use or other substance use during pregnancy may be especially influenced by this social desirability factor. Hence, although the data may be gathered in a reliable and unbiased manner, they still may not reflect actual behavior with complete accuracy.

Also, some survey questions ask respondents to recall behavior or events that occurred five, ten or more years ago. Recall over such lengthy periods of time may be prone to inaccuracies.

SURVEY INSTRUMENT

The survey instrument was designed to gather information about alcohol and tobacco use by women of child-bearing age, and knowledge, beliefs and social norms regarding such use, especially during pregnancy. The instrument was designed as a structured interview to be administered over the telephone. The major topics covered by the instrument were:

- Current use of alcohol and history of use
- Current cigarette smoking
- Cigarette smoking during most recent pregnancy
- Use of alcohol during most recent pregnancy
- Knowledge and beliefs about the effects of alcohol, tobacco and cocaine during pregnancy

- Social norms regarding use of alcohol during pregnancy
- Contact with health care providers
- Health care provider warnings regarding the use of alcohol and tobacco during pregnancy
- Demographic characteristics of the respondent.

The instrument included questions drawn from previous surveys of alcohol and tobacco use as well as newly created questions. Questions about the use of these substances during pregnancy focused upon the most recent pregnancy that lasted five or more months. The format of the instrument is fairly complex with many potential skips and branching. This is because many questions only applied to some of the women -- e.g., those who had ever been pregnant, those who drank alcohol or those who smoked cigarettes. The instrument was reviewed and critiqued by a number of staff within the Minnesota Department of Health and the Department of Human Services during its development.

A pretest was conducted by Wilder Research Center interviewers to field test the instrument prior to launching the survey. Telephone interviews were conducted with 20 women of child-bearing age. Their telephone numbers were randomly selected from Twin Cities and greater Minnesota telephone directories. Before calling, each telephone number was checked to make sure it wasn't included in the list of numbers to be used for the survey. Women in the pretest ranged in age from 20 to 42, some lived in the Metro Area and some were from greater Minnesota, and some had been pregnant and some had not. There was also variation across the sample in alcohol and tobacco use patterns. Hence, the range of circumstances we were likely to encounter in the survey were covered quite well in the pretest.

After the pretest, the survey instrument was finalized. Minor revisions were made in the wording of some questions for ease of administration, answer categories were added for several questions, and a couple of follow-up questions were added as a result of the pretest experience. It took 13 minutes, on the average, to administer the instrument by telephone.

SURVEY IMPLEMENTED

Interviewer Training

The interviewer training included the following components: briefing on the background and purpose of the study, explaining procedures for identifying eligible respondents and introducing the survey to them, going through the survey instrument item by item, and doing practice interviews. Less experienced interviewers also received training in general survey interviewing techniques and procedures. A total of 23 women were trained for the survey.

Conducting the Survey

The survey was conducted from October 30, 1993 to January 9, 1994. The telephone interviewers worked in three to four hour shifts. Monday to Thursday each week there were three shifts: 9:00 a.m. to 12:00 p.m., 1:00 - 5:00 p.m., and 6:00 - 9:00 p.m. On Friday and Saturday, there were morning and afternoon shifts, but no evening shift. On Sunday, there was one shift, from 12:00 - 4:00 p.m. No survey interviewing was done on holidays. There was some flexibility to this schedule. For example, an appointment to do an interview was kept regardless of whether it fell within normal shift hours.

A number of procedures were followed for quality control and sample monitoring purposes. Interviewer supervisors did on-line monitoring of survey interviews in progress. Completed surveys were reviewed on a daily basis for completeness and to identify any problems. If missing information or a mistake was identified, interviewers called back the respondents so that the survey form could be corrected. The data from the survey forms were entered into the computer on an ongoing basis. Errors were also caught during this data entry process and turned over to the interviewers for follow-up with respondents and correction.

The sample was also monitored on an ongoing basis. As telephone numbers in the sample were determined to be unusable (e.g., ineligible household, business phone number) they were replaced with new numbers taken in the sequence in which they had been selected. As mentioned earlier, refusals were not dropped from the active list right away. Most were called back and re-asked to participate. Progress toward reaching the goal for number of interviews completed in each region was monitored on a daily basis using the computer.