

INSIGHTS: SMOKING IN WISCONSIN

A series of papers analyzing Wisconsin tobacco use and providing recommendations for action, based on interviews with 6000 Wisconsin residents.

Smoking and Pregnancy

Action Paper Number 2

CTRI

Center for
**Tobacco Research
and Intervention**
University of Wisconsin
Medical School



**WISCONSIN
TOBACCO
CONTROL BOARD**



University of Wisconsin
Comprehensive Cancer Center

The background of the page features a light teal color with a subtle, embossed graphic. On the left side, there is a bar chart with several vertical bars of varying heights. Below the bars, there are large, white, sans-serif numbers: '80', '70', '60', '50', and '40'. At the bottom of the page, there is a line graph with a solid line and a dashed line, both showing an upward trend. The overall aesthetic is clean and professional, typical of a report or document cover.

SMOKING AND PREGNANCY

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EXECUTIVE SUMMARY

Through over 6000 interviews conducted with Wisconsin residents, the Wisconsin Tobacco Survey (WTS) offers insight into the problem of smoking during and after pregnancy. Research has shown that women who smoke are more likely to have problems becoming pregnant and that pregnant smokers experience higher rates of miscarriage, stillbirth, and pregnancy complications than do nonsmoking pregnant women. Children who are born to mothers who smoke weigh less at birth than children born to nonsmoking mothers and are more likely to be born prematurely. These children are also at greater risk for Sudden Infant Death Syndrome (SIDS) and have more childhood illnesses and school problems than do children born to nonsmoking mothers. Thus, helping pregnant smokers and women of childbearing age to quit smoking is a top public health priority.

Historically, Wisconsin has had one of the highest rates of smoking among pregnant women in the nation. In 2000, 16.5% of pregnant women in Wisconsin smoked during their pregnancy (11,428 out of 69,289 pregnancies) compared with a national rate of approximately 12%. This report examines trends in smoking and quitting smoking among currently-and previously-pregnant adult women in Wisconsin.

TRENDS & PROGRESS SINCE 1960

In order to examine trends and progress since 1960 in reducing the prevalence of smoking during pregnancy, female WTS respondents who ever smoked were classified into groups based on the year that they were last pregnant. A total of 663 currently or previously pregnant respondents provided information about the year of their last pregnancy. We grouped these respondents according to the year of their last

pregnancy (1960-1969, 1970-1979, 1980-1989, 1990-1999, and 2000-2001) and conducted a set of analyses comparing respondents who smoked during pregnancy with those who did not smoke during pregnancy.

Another set of analyses examined demographic and other factors associated with smoking and quitting smoking during pregnancy. Data for respondents who were last pregnant since 1990 were combined to allow for a sufficiently large sample size of respondents who were pregnant within approximately the last 10 years. These analyses focused on a total of 265 women who had both smoked at some time in their lives and had also been pregnant since 1990. Of these women, 126 reported smoking during their last pregnancy and 139 reported not smoking during their last pregnancy.

The results of this survey showed that a disturbingly high percentage of Wisconsin smokers continued to smoke after learning that they were pregnant (48% in 2000-01) although the average number of cigarettes smoked per day by these pregnant women appears to be decreasing in recent decades. Another promising trend was the increasing percentage over time of pregnant smokers who made a quit attempt lasting 7 days or longer. Only 10% of pregnant smokers made such a quit attempt in the 1960s compared to 31% in 2000-01. Also, an increasing percentage of smokers who made a serious quit attempt have been able to stay abstinent for the duration of pregnancy (44% before 1990; 61% after 1990).

EXECUTIVE SUMMARY CONTINUED

CLINICIAN INTERVENTION WITH PREGNANT SMOKERS

The survey results provide helpful insights into the successes and challenges for physicians and other clinicians who care for pregnant smokers. Most clinicians are asking pregnant smokers about tobacco use (88% in 2000-01) and advising them to quit (78% in 2000-01). However, during the past 10 years, only about 1 in 5 pregnant smokers was encouraged to set a quit date and only 1 in 10 was offered information or referral for specialized smoking cessation treatments. All pregnant women should be asked about tobacco use at every clinic visit and all tobacco-using pregnant women should be offered both encouragement to quit and assistance with quitting. The important role of perinatal and other healthcare providers in treating tobacco use and dependence cannot be overstated.

FACTORS RELATED TO SMOKING AND QUITTING SMOKING DURING PREGNANCY

Consistent with other surveys, several factors appear related to whether Wisconsin pregnant women smoke or not. The most important factors associated with smoking during pregnancy include having a spouse/partner who smokes, having many friends and family members who smoke, less education, and lower income. Major factors associated with making a quit attempt during pregnancy include having fewer friends and family members who smoke and having at least a high school education. Knowledge of these factors may help clinicians and policymakers to reduce further the likelihood that pregnant women will smoke during pregnancy.

SUMMARY

Taken together, these findings indicate that coordinated efforts by clinicians, public health workers, researchers, and policy makers are required to reduce smoking prevalence in pregnant women and women of childbearing age in Wisconsin. The public health benefits of reducing smoking prevalence among pregnant smokers are enormous. The reduction in smoking prevalence should be a top priority given the harmful effects of smoking on both mother and child. There are effective treatments that are available for pregnant smokers including specialized programs such as Wisconsin's First Breath program and the Wisconsin Tobacco Quit Line. This action report highlights progress to date and makes specific recommendations for further reducing the prevalence of smoking among pregnant smokers.



PURPOSE AND INTRODUCTION

The Wisconsin Tobacco Survey provides a comprehensive look at Wisconsin smoking patterns, attitudes, and climate. Based on interviews with over 6000 Wisconsin residents, including current, former, and never smokers, the WTS provides valuable insights into tobacco dependence, attempts at cessation and support for those attempts. Findings from the survey are summarized in a series of action papers. The purpose of these action papers is twofold: to communicate these insights and to offer recommendations for actions to reduce tobacco dependence.

This action paper describes trends in smoking and quitting among current and previously-pregnant women. The harmful effects of smoking on the health of children (before and after birth) and mothers are well documented. Women of childbearing age who smoke have more difficulty getting pregnant and have higher rates of miscarriage, stillbirth, and pregnancy complications than do nonsmoking women. Tobacco use by pregnant women is especially harmful to the unborn child.

Harmful effects of smoking during pregnancy on the unborn child and the child after birth:

- Low birth weight (which can result in greater likelihood of health problems and death)
- Preterm birth (not carrying the baby full-term)
- Slowed or reduced physical growth
- Higher risk (2-4 times higher) for Sudden Infant Death Syndrome (SIDS)
- Problems in school
- More childhood illnesses

Harmful effects on young children of exposure to tobacco smoke after birth:

- Higher risk for SIDS
- Greater risk of lung conditions such as bronchitis, pneumonia, and asthma
- Greater risk of ear infections
- More hospitalizations

Long-term effects of mothers' smoking on children:

- Lower IQ
- Decreased height
- Problems with reading and spelling
- More likely to be hyperactive

PURPOSE AND INTRODUCTION CONTINUED

PREVALENCE OF SMOKING DURING PREGNANCY IN WISCONSIN

Historically, Wisconsin has had one of the highest rates of smoking among pregnant women in the United States. For example, 22.9% of Wisconsin women who gave birth to a child in 1990 smoked during their pregnancies (7th highest in the nation; Jehn et al., 2001) compared to an overall rate in the United States in 1990 of 18.4% (Mathews, 2001). By 1995, the rate in Wisconsin had decreased to 18.9% and the most recently available data for 2000 show a further decrease to 16.5% (Table 1). Table 1 also highlights two important indicators of the harmful effects of smoking during pregnancy. Pregnant women who smoke are twice as likely to deliver low birth-weight infants and, more tragically, children born to smoking mothers are more than twice as likely to die during infancy than other children.

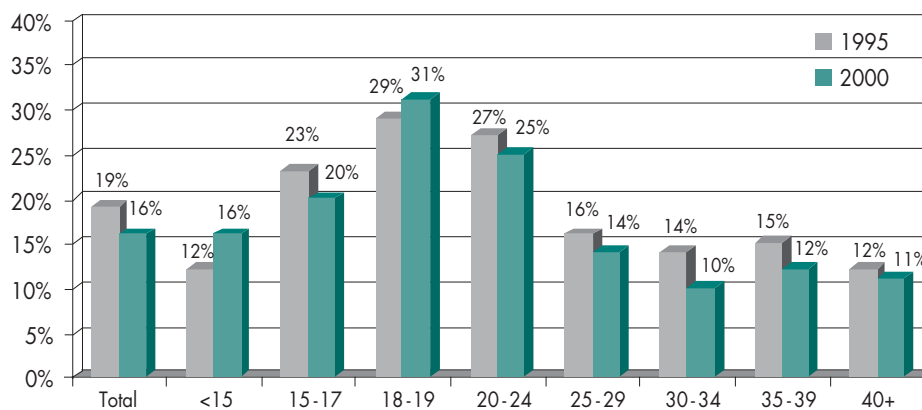
Table 1- Facts on Pregnancy and Smoking in Wisconsin: 1995 and 2000

	1995	2000
Total number of live births	67,493	69,289
Percentage of pregnant women who smoked	18.9%	16.5%
Percentage of low birthweight babies – Smokers	10.0%	10.1%
Percentage of low birthweight babies – Non Smokers	5.1%	5.8%
Infant deaths per 1000 live births – Smokers	11.0	10.3
Infant deaths per 1000 live births – Nonsmokers	6.3	5.8

From: *Wisconsin Births and Infant Deaths, 1995 and Wisconsin Births and Infant Deaths, 2000*

The rate of smoking in pregnant women in Wisconsin continues to be higher for younger age groups, with the highest rate of 31% in 2000 for 18-19 year old mothers followed by 25% for 20-24 year old mothers (Figure 1). Figure 2 illustrates the wide variation in smoking rates among racial and ethnic groups in Wisconsin with the highest rate in 2000 of 40% among Native Americans.

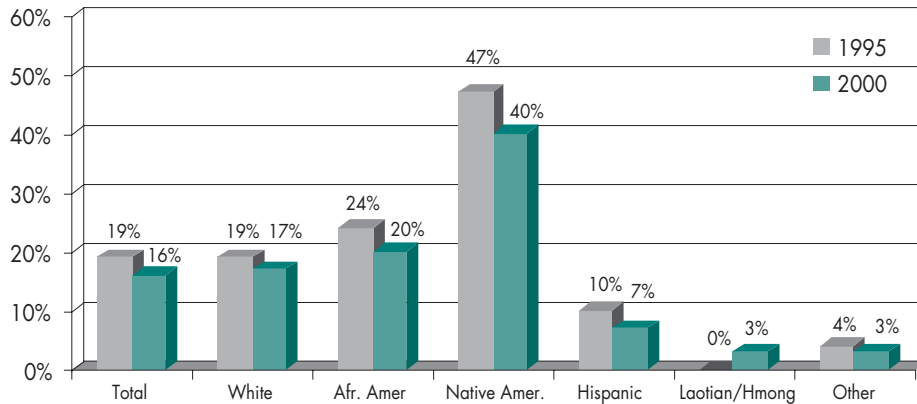
FIGURE 1 Percentage of women who smoked during pregnancy by age, 1995 and 2000



From:
Wisconsin Births and Infant Deaths, 1995 and Wisconsin Births and Infant Deaths, 2000

FIGURE 2

Percentage of women who smoked during pregnancy by race/ethnicity, 1995 and 2000



From: *Wisconsin Births and Infant Deaths, 1995* and *Wisconsin Births and Infant Deaths, 2000*

SMOKING AMONG WOMEN OF REPRODUCTIVE AGE

In 1989, Wisconsin had one of the highest rates of tobacco use (37%) among women of reproductive age (Centers for Disease Control and Prevention, 1991). By 1996, the tobacco use rate for Wisconsin women of reproductive age had declined to 28% (Wisconsin Behavioral Risk Factor Survey 1996). While this represents some progress, there is a continuing need in Wisconsin to further reduce rates of smoking among women of childbearing age and especially among currently pregnant women. This action paper provides important information about pregnancy and smoking in Wisconsin that can be used in formulating tobacco control policy and strategies to encourage and assist mothers and reproductive-aged women in Wisconsin to avoid tobacco use.

PURPOSE AND INTRODUCTION CONTINUED

ISSUES ADDRESSED IN “SMOKING AND PREGNANCY”

This action paper addresses the following issues related to pregnancy and smoking:

- **Smoking before and during pregnancy.** What are the trends over time in smoking before and during pregnancy? What are the trends in quit attempts by pregnant smokers?
- **Healthcare provider behavior.** Are doctors and other healthcare professionals who treat pregnant women following the U.S. Public Health Service Clinical Practice Guideline: *Treating Tobacco Use and Dependence* (Fiore et al., 2000)? Are they identifying smokers, encouraging quitting, and providing cessation assistance?
- **Factors associated with smoking during pregnancy.** Are demographic factors (age, education, income) related to smoking during pregnancy? Does having a spouse/partner who smokes make it more likely that a pregnant woman will smoke? How is a pregnant woman's social network (friends and family members) related to smoking during pregnancy?
- **Factors associated with making a quit attempt during pregnancy.** Are demographic factors (age, education, income) related to likelihood of making a quit attempt? Does having a spouse/partner who smokes make a difference? How does having a majority of friends and family members who smoke affect the likelihood of making a quit attempt?

THE WISCONSIN TOBACCO SURVEY

The Wisconsin Tobacco Survey included a weighted total of 884 adult women who were “ever smokers” (current or former cigarette smokers). These female respondents were asked if they had ever been pregnant and, if so, when their last pregnancy occurred. A total of 663 respondents (75% of female ever smokers) were previously pregnant, 28 (3%) were pregnant at the time of the survey, and 191 (22%) were never pregnant. This action paper focuses only on the 691 current or former smokers who reported ever being pregnant.

In order to examine trends over time, respondents were classified by the year that they were last pregnant. We grouped these respondents according to the year of their last pregnancy as follows: 1928-1959, 1960-1969, 1970-1979, 1980-1989, 1990-1999, and 2000-2001. Because the health hazards of smoking were not established until the 1950s, these analyses focus on women who were last pregnant from 1960 through mid-2001 (when the survey was conducted). Results for 46 respondents who were last pregnant before 1960 were not included in the analyses.

To study recently pregnant smokers, data for respondents who were last pregnant since 1990 were combined. These analyses focused on a total of 265 smokers of which 126 reported smoking during their last pregnancy and 139 reported not smoking during their last pregnancy. We assumed that these respondents had first started smoking prior to becoming pregnant and that some individuals continued to smoke and some stopped smoking during pregnancy.

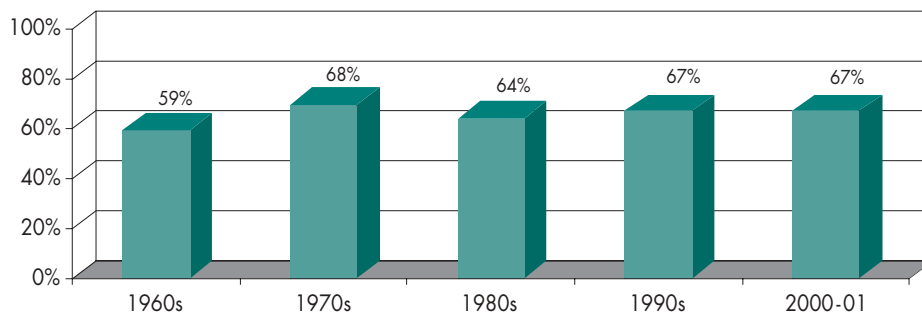
THE DATA

SMOKING BEFORE AND DURING PREGNANCY

Compared to nonsmoking women, women of childbearing age who smoke have more difficulty getting pregnant. The WTS asked respondents who ever smoked to indicate whether or not they smoked during the 30 days before they became pregnant. Since 1960, approximately two-thirds of WTS respondents reported smoking during the month before pregnancy (Figure 3). There was only small variation in the percentages from 1960 through 2001 and no trend towards a decreased smoking rate was observed.

FIGURE 3

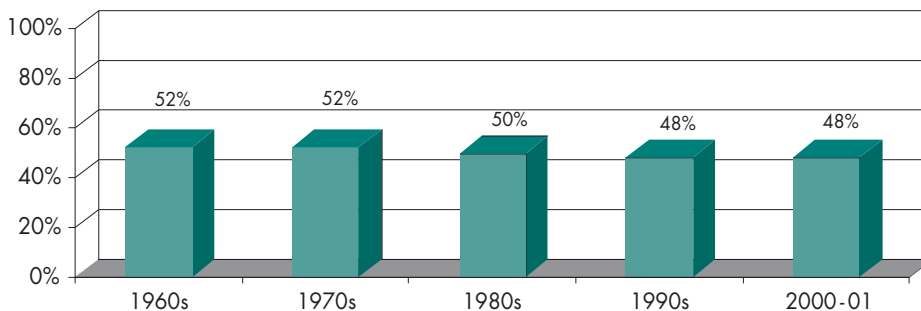
Percentage of current or former smokers who smoked in the 30 days before becoming pregnant



The WTS also asked respondents if they smoked after they found out that they were pregnant. A slight decreasing trend was observed from the 1960s to 2000-2001 but approximately half of all ever smokers (current or former) smoked at some point during their pregnancy (Figure 4). This finding is surprising given the increase since the 1960s in information about the harmful effects of smoking that has been made available to smokers through the media and from health care providers.

FIGURE 4

Percentage of current or former smokers who smoked after learning about being pregnant

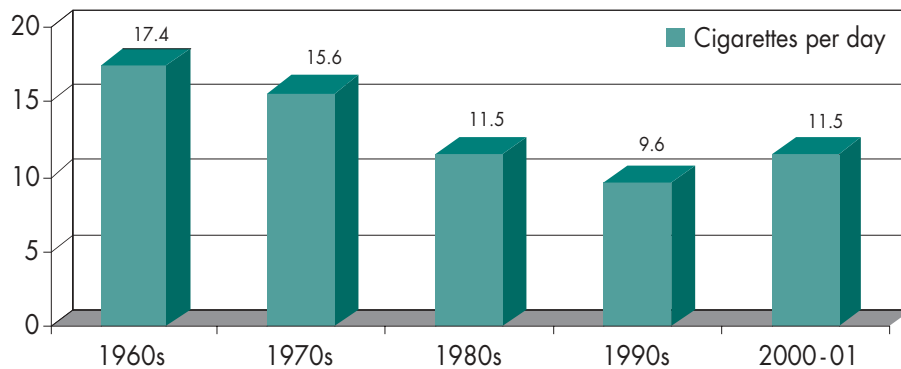


THE DATA CONTINUED

Respondents who smoked during their last pregnancy were asked to indicate how many cigarettes they smoked during pregnancy. Health data indicate that the more a woman smokes, the greater the risk to the unborn baby. WTS data reveal a decreasing number of cigarettes smoked per day since the 1960s with a small increase among recently-pregnant (2000-2001) smokers (Figure 5). The overall decrease in the average number of cigarettes smoked per day is encouraging but further efforts are warranted to reverse the recent upward trend.

FIGURE 5

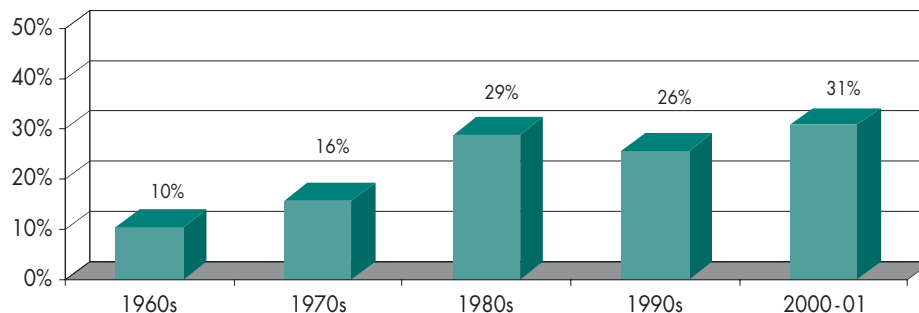
Mean number of cigarettes smoked per day by respondents who smoked during their pregnancy



An important indicator of progress in reducing smoking during pregnancy is the presence of a sustained quit attempt lasting 7 days or longer. The WTS asked respondents who smoked during their last pregnancy if they had quit for 7 days or longer. The results showed that three times as many recently-pregnant smokers made a 7-day or longer quit attempt compared to smokers who were pregnant during the 1960s (Figure 6).

FIGURE 6

Percentage of pregnant smokers who made a quit attempt lasting 7 days or longer



Another encouraging trend concerns the percentage of respondents who were able to maintain abstinence after a quit attempt. Because of small sample sizes, data for the years 1960-1989 were combined into one group as were the data for the years 1990-2001. **Since 1990, approximately 61% of pregnant smokers who made a quit attempt of 7 days or longer were able to maintain abstinence compared to approximately 44% of respondents who made a similar quit attempt during 1960-1989.**

Taken together, these results suggest that a larger percentage of pregnant smokers are trying to quit and are successfully staying quit. However, a majority of pregnant smokers are not making sustained quit attempts and about 40% of those who do make such an attempt return to smoking.

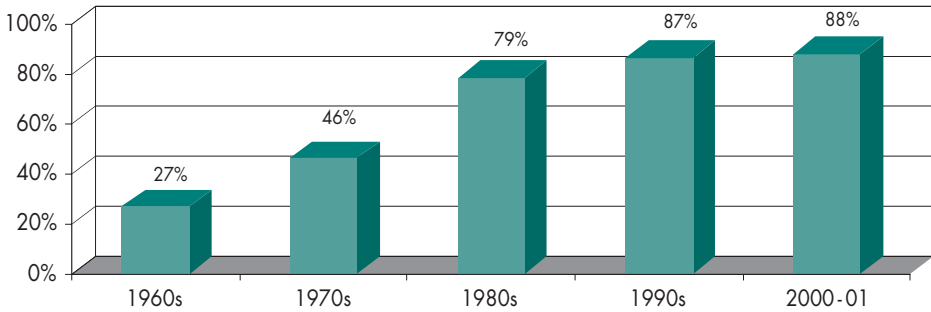
HEALTHCARE PROVIDER BEHAVIOR

A key factor in reducing smoking during pregnancy is the role of healthcare providers in identifying and treating pregnant smokers. Virtually all pregnant women seek medical care during their pregnancy. As such, healthcare providers who care for pregnant patients are in a unique position to identify and intervene with pregnant smokers. The recent U.S. Public Health Service Clinical Practice Guideline, *Treating Tobacco Use and Dependence* (Fiore et al., 2000), recommends that all patients should be asked about tobacco use and should have their tobacco-use status documented on a regular basis.

The WTS asked respondents whether or not their doctor or other healthcare professionals asked them about using tobacco after respondents learned they were pregnant. The results showed a dramatic increase since the 1970s in the percentage of healthcare providers who asked pregnant respondents about tobacco use (Figure 7). Although this percentage for respondents who were last pregnant during 2000-2001 was high, 12% of pregnant patients reported that they were not asked about smoking and other tobacco use.

FIGURE 7

Percentage of pregnant smokers who reported that healthcare providers asked them about tobacco use

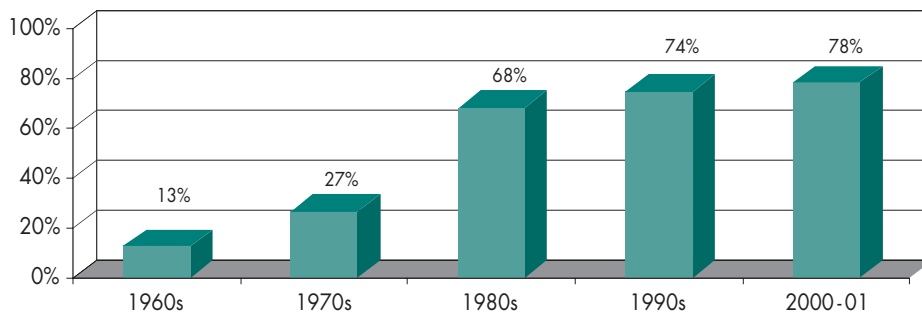


THE DATA CONTINUED

The U.S. Public Health Service Clinical Practice Guideline, *Treating Tobacco Use and Dependence* (Fiore et al., 2000), also recommends that all physicians and clinicians strongly advise their patients who smoke to quit. The WTS asked respondents who smoked during their last pregnancy whether or not their doctor or other healthcare provider advised them to stop. The results showed that great improvements have been made since the 1960s when only about 1 in 10 pregnant smokers were advised to quit (Figure 8). For respondents who were last pregnant during 2000-2001, about 3 out of 4 (78%) reported that their doctor or other health professional advised them to quit.

FIGURE 8

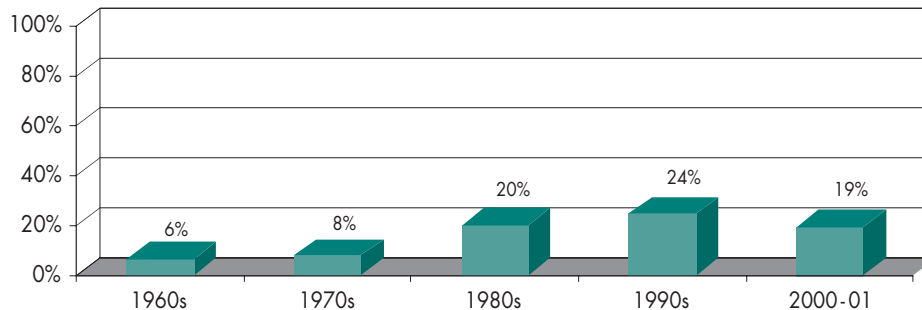
Percentage of pregnant smokers who reported that healthcare providers advised them to quit using tobacco



All healthcare providers should not only encourage pregnant smokers to quit, but they should also provide pregnant smokers with assistance in quitting. The WTS asked respondents to indicate whether or not their doctor or other healthcare provider encouraged them to set a quit date or offered other cessation assistance. The results showed that few pregnant smokers reported being encouraged to set a quit date although there is an increasing trend over time (Figure 9) with a slight decrease during 2000-2001.

FIGURE 9

Percentage of pregnant smokers who reported that healthcare providers encouraged them to set a quit date



The WTS also asked respondents to indicate whether or not their doctor or other health professional gave them information about smoking cessation or referred them to a smoking cessation program. Given the rarity of specialized smoking cessation programs before 1990, results were compiled for respondents who were last pregnant since 1990. **These results showed that fewer than 1 in 10 respondents reported that their doctor or other health professional provided information or referrals for smoking cessation.**

Clearly, healthcare providers should offer a variety of cessation assistance to all pregnant smokers given the potential harm to child and mother. Thus, this is an area of intervention that needs considerable improvement.

FACTORS THAT ARE ASSOCIATED WITH SMOKING DURING PREGNANCY

There are several factors that are associated with smoking during pregnancy as well as having difficulty quitting during pregnancy. Major factors include starting to smoke at a young age, heavy smoking, young age at pregnancy, having a spouse/partner who smokes, lower education, and lower income (Lu, Tong, & Oldenburg, 2001). The WTS included questions about these risk factors, which are examined in a series of analyses presented below.

To examine these issues, data for respondents (those reporting they were ever smokers) who were last pregnant since 1990 were analyzed to allow for a sufficiently large sample size of 265 respondents who were pregnant within approximately the last 10 years. These analyses compared 126 respondents who reported smoking during their last pregnancy with 139 respondents who reported not smoking during their last pregnancy.

Table 2 shows that respondents who smoked during their last pregnancy started smoking at a younger age, were less likely to have at least a high school education, and had lower annual incomes compared to respondents who did not smoke during their last pregnancy. The individual effects of these demographic factors were modest but the presence of more than one of these risk factors may incrementally increase the risk for smoking during pregnancy.

Smoking during pregnancy was even more highly related to having smokers among family or friends. Over half of the respondents who smoked during their last pregnancy had a spouse or partner who smoked compared with only one-third of the respondents who did not smoke during pregnancy. The most influential factor differentiating the two groups is having a majority of family members or friends who smoke. Almost two-thirds of respondents with a majority of their family members or friends as smokers reported smoking during pregnancy compared to only one-fourth of respondents who did not smoke during their last pregnancy.

THE DATA CONTINUED

Table 2- Factors Influencing Ever Smokers to Smoke During Pregnancy

Risk Factor	Respondents Who Did Not Smoke During Last Pregnancy (n=140)	Respondents Who smoked During Last Pregnancy (n=126)
Half or more of friends/family members smoke (%Yes)	25.7	65.6
Annual household income < \$35,000 (%)	43.2	57.1
Less than a high school education (%)	43.5	56.5
Spouse or partner who smokes (% Yes)	33.1	52.4
Age at last pregnancy (in years)	27.0	26.4
Age when first started smoking (in years)	15.3	14.3

Of additional interest, **almost 84% of the respondents who reported smoking during their last pregnancy were smoking at the time of the survey. Only about half of the respondents who did not smoke during their last pregnancy were smoking at the time of the survey.** This finding is important because of the harmful effects of postpartum smoke exposure on infants and children of mothers who continued to smoke.

FACTORS ASSOCIATED WITH MAKING A QUIT ATTEMPT DURING PREGNANCY

These analyses focus on respondents who reported smoking during their last pregnancy. A total of 122 of 126 respondents answered a survey question about making a quit attempt during their last pregnancy. Analyses compared those who quit smoking for 7 days or longer during their pregnancy with those who did not quit for at least 7 days.

Results of the analyses showed that only a few risk factors were associated with making a quit attempt (Table 3). The most important finding in these analyses concerns educational level. Nearly 40% of respondents who did not make a quit attempt had less than a high school education compared with only about 3% of respondents who reported making a quit attempt. Also, respondents who smoked fewer cigarettes and who had fewer family members or friends who smoked were more likely to have made a quit attempt but the associations were more modest. Income, age at first cigarette, age at last pregnancy, and spouse/partner smoking were not associated with making a quit attempt.

Table 3- Factors Associated with Making a Quit Attempt for 7 Days or Longer Among Respondents Who Smoked During Pregnancy

Risk Factor	Respondents Who Did Not Make A Quit Attempt (n=88)	Respondents Who Made A Quit Attempt (n=34)
Annual household income < \$35,000 (%)	58.0	58.8
Spouse or partner who smokes (% Yes)	52.3	54.5
Half or more of friends/family members smoke (%Yes)	71.6	50.0
Age at last pregnancy (in years)	26.5	25.7
Age when first started smoking (in years)	14.0	14.4
Number of cigarettes per day during pregnancy	11.2	8.6
Less than a high school education (%)	38.8	2.9

Among the respondents who made a serious quit attempt (abstinent 7 days or longer) during their last pregnancy, 61.8% were able to remain abstinent for the rest of their pregnancy. On a less positive note, only 27.3% of these respondents were abstinent at the time of the survey. Furthermore, only 11.4% of those women who did not make a quit attempt during their last pregnancy were abstinent at the time of the survey.

CONCLUSIONS

Smoking during and after pregnancy is a major public health concern given the potential for a wide range of harmful effects on both the mother and child.

The findings in this report suggest that progress is being made in lowering the prevalence of smoking during pregnancy in Wisconsin but continued effort is needed to sustain that progress and to address areas that need improvement. The modest 2-3 percentage point reduction in the percentage of Wisconsin women who smoked during pregnancy from 1995 (18.9%) to 2000 (16.5%) and the higher rates among 18-24 year-olds (>25%) in 2000 attest to the continuing importance of prevention and treatment programs for women of childbearing age.

The results of this survey showed that a high percentage of Wisconsin smokers continued to smoke after learning that they were pregnant (48% in 2000-01). However, the average number of cigarettes smoked per day by these pregnant women appears to have decreased in recent decades. Another promising trend was the increasing percentage over time of pregnant smokers who made a quit attempt lasting 7 days or longer. Only 10% of pregnant smokers achieved 7 days of abstinence in the 1960s compared to 31% in 2000-01. Also, an increasing percentage of smokers achieving initial abstinence were able to stay abstinent for the duration of pregnancy (44% before 1990; 61% after 1990).

Doctors and other health providers who care for pregnant smokers are doing well in some areas but much improvement is needed in other important areas. Clinicians are doing a relatively good job of asking pregnant smokers about tobacco use (88% in 2000-01) and advising them to quit (78% in 2000-01). However, during the past 10 years, only about 1 in 5 pregnant smokers were encouraged to set a quit date and only 1 in 10 were offered information or referral for specialized smoking cessation treatments. All pregnant women should be asked about tobacco use at every clinic visit and all tobacco-using pregnant women should be encouraged to quit and assisted with quitting. The important role of perinatal and other healthcare providers treating tobacco use and dependence in pregnant women cannot be overstated.

Consistent with other surveys, several factors appear to be associated with smoking and quitting smoking during pregnancy. The most important factors associated with smoking during pregnancy include having a spouse/partner who smokes, having many friends and family members who smoke, less education, and lower income. Major factors associated with making a quit attempt during pregnancy include having fewer friends and family members who smoke and having at least a high school education. Knowledge of these factors may help clinicians and policymakers to reduce further the likelihood that pregnant women will smoke.



RECOMMENDATIONS

Both Healthy People 2010 (a health promotion and disease prevention agenda from the U.S. Department of Health and Human Services) and the Wisconsin Tobacco Control Board (WTCB) have established ambitious goals for reducing smoking prevalence in all groups of Wisconsin citizens. Reducing smoking prevalence in pregnant women should be a top priority given the harmful effects of smoking on both mother and child.

In 2000, the prevalence rate of smoking during pregnancy in Wisconsin was 16.5%. The Healthy People 2010 goal is a 50% reduction in overall smoking prevalence while the WTCB has set a shorter-term goal of reducing overall smoking prevalence by 20% by 2005. Thus, the short-term (2005) goal for reducing smoking during pregnancy is a prevalence rate no higher than 13.2% and the long-term goal is a rate no higher than 8.3%. To reach the goals of the WTCB and Healthy People 2010, certain immediate actions must be taken. Based on the Wisconsin Tobacco Survey and other research, the following action steps are recommended:

➤ **Train Healthcare Providers.** Because virtually all women seek medical care after becoming pregnant, perinatal clinicians and others in the health care system play a vital role in identifying pregnant smokers and providing motivation and assistance to quit. Perinatal clinicians and other health professionals should be trained to provide effective, evidence-based treatment and relapse prevention with all pregnant smokers. Support of training and technical assistance for healthcare providers and tobacco cessation specialists should be enhanced.

- **Promote the Wisconsin Tobacco Quit Line to Pregnant Smokers.** The Wisconsin Tobacco Quit Line offers special cessation assistance to pregnant smokers and new mothers at no cost and provides referral information to local programs for additional help. Effective strategies to increase the use of the Quit Line by pregnant smokers should be implemented. These strategies include paid advertising, media coverage, and referrals through healthcare providers and others.
- **Support First Breath.** The Wisconsin First Breath smoking cessation program for pregnant smokers, sponsored by the Wisconsin Women's Health Foundation, has shown promise in pilot studies and should remain a priority for continued funding and support.
- **Assist At-Risk Populations.** Special efforts should be made to identify and assist smokers in specific at-risk populations such as younger women of childbearing age and racial/ethnic minorities. In addition, treatments should be tailored to optimally assist smokers from diverse backgrounds.
- **Increase Utilization by BadgerCare and Medicaid Recipients.** Smoking cessation is a covered benefit available to individuals eligible for BadgerCare and Wisconsin Medicaid recipients. Public health clinics, WIC providers, community clinics, and HMOs serving Medicaid recipients are well-positioned to assist women with cessation. Special efforts should be made to increase the availability of tobacco cessation treatment to these recipients as well as utilization of this covered benefit by recipients.

➤ **Support Prevention of Smoking in Women of Childbearing Age.**

Prevention of smoking initiation in teenage girls and young women of childbearing age is an important part of reducing smoking during pregnancy. Continued funding of effective prevention programs as well as funding of additional research on prevention programs will contribute to the overall reduction in smoking rates in pregnant women.

- **Support a Comprehensive Tobacco Control Program.** A comprehensive tobacco control program should be a funding priority for Wisconsin. This comprehensive program should include programs designed to change social norms about smoking, to reduce exposure to second-hand smoke, and to address the treatment needs of smokers within the context of their families, friends, and communities. Support for research to identify the most effective approaches to tobacco control should also be a funding priority.

RESOURCES

STATE OF WISCONSIN RESOURCES:

Tobacco Control Resource Center for Wisconsin

<http://www.wtcb.state.wi.us/>

Wisconsin *First Breath* Smoking Cessation Program for Pregnant Smokers

<http://www.wwhf.org/firstbreath.htm>

1-800-448-5148 (Lisette Jehn at the Wisconsin Women's Health Foundation)

Wisconsin Tobacco Quit Line:

1-877-270-STOP (7867)

University of Wisconsin Medical School Center for Tobacco Research and Intervention:

<http://www.ctri.wisc.edu>

608-262-8673

FEDERAL RESOURCES:

U. S. Public Health Service Clinical Practice Guideline: *Treating Tobacco Use and Dependence*

<http://www.surgeongeneral.gov/tobacco/>

Women and Smoking: A Report of the Surgeon General

http://www.cdc.gov/tobacco/sgr_forwomen.htm

CDC Tobacco Information and Prevention Source (TIPS)

<http://www.cdc.gov/tobacco/index.htm>

1-800-CDC-1311



TECHNICAL NOTES

The Wisconsin Tobacco Survey (WTS) was conducted in 2001 by the University of Wisconsin Center for Tobacco Research and Intervention (UW-CTRI). The survey garnered information from 6135 Wisconsin residents using extensive interviews. The purpose of the survey was to provide important information about: 1) current tobacco use patterns among Wisconsin adults, 2) attitudes towards efforts to regulate tobacco, 3) patterns of smoking cessation attempts, and 4) a number of other tobacco research issues. The survey included 162 questions on general health, tobacco use, smoking cessation, smokers' use of health care services, smoking during pregnancy, and demographics.

The survey consisted of three primary tracks – current cigarette smoker, former cigarette smoker, and never cigarette smoker. Current smoker was defined as someone who smoked 100 cigarettes in a lifetime and now smokes every day or some days. A former smoker was defined as someone who smoked 100 cigarettes in a lifetime and now does not smoke at all. A never smoker was defined as someone who has never smoked a cigarette or has never smoked 100 cigarettes in a lifetime. Questions about tobacco use of any kind (e.g., cigar smokers, pipe smokers, or snuff/chewing tobacco users) were also included. A major goal of the project was to contrast trends in behaviors and attitudes across these different groups defined on the basis of tobacco use status.

UW-CTRI retained Opinion Dynamics Corporation (ODC) to conduct the 2001 Wisconsin Tobacco Survey (WTS). The WTS used a scientifically-selected random sample which gave all households with telephones a chance of inclusion in the study. Within a selected household, the respondent was chosen by a procedure that randomly selects the oldest adult male, the youngest adult male, the oldest adult female or the

youngest adult female. Household members eligible for inclusion in the survey included all related adults (aged 18 or older), unrelated adults, roomers, and domestic workers who consider the household their home.

The survey was designed to over sample the two most disproportionately African American counties in Wisconsin, Milwaukee and Racine. Out of 6,135 people surveyed, people living in Milwaukee and Racine counties completed 2,226 surveys. African American residents completed four percent or 268 surveys. Neither Native Americans nor Hispanics could be over sampled meaningfully without compromising the rest of the project.

The survey was programmed into a Computer Assisted Telephone Interviewing (CATI) software program to perform the basic data collection tasks of telephone interviewing. As questions were displayed, the interviewer read them to the respondent and keyed in the responses. The survey automatically skipped inappropriate questions and checked for the acceptability of responses. All attempts to contact potential respondents were tracked and coded by sample disposition. This enabled the CATI system to properly designate sample points for calling, schedule callbacks, and administer non-responsive contact attempts.

Before eliminating a respondent from the sample and randomly selecting a replacement, at least five telephone calls were made to reach the household. Efforts were made to ensure a highly representative sample by varying calls at different times of day and on different days of the week. Callbacks were scheduled as requested by respondents. Completed interview status was only assigned once all data was collected for a given interview.

TECHNICAL NOTES CONTINUED

For the purpose of this study, the Council of American Survey Research Organizations (CASRO) methodology was used to calculate response rate. The methodology apportioned dispositions with unknown eligibility status (e.g., no answer, answering machine, busy, etc.) to dispositions representing eligible respondents in the same proportion as exists among all calls of known status. The starting sample (N) for the entire survey was 33,636. Thirty-six percent of this group was invalidated (e.g., disconnected phone, busy phone), leaving a N of 21,387. The application of the CASRO response rate formula to this sample resulted in an adjusted N of 19,036. A total of 6,155 respondents completed the interview, resulting in a CASRO-adjusted response rate of 32.3%.

Data from 20 respondents were deleted from the final dataset due to inconsistencies in their responses to the tobacco use questions. A total of 6,135 valid surveys were included in the final dataset. Among those people, 4,106 never smoked, 1,071 were former smokers and 958 were current cigarette smokers. To ensure confidentiality, no respondent identifiers were retained in the interview records, and reports cite only aggregate figures.

The Wisconsin Tobacco Survey data were weighted to more accurately represent the population of Wisconsin. WTS data were weighted based on five demographic, geographic, and SES characteristics of respondents – age, gender, race, education attainment, and geographic location. Known population information was based on the 2000 Census data for Wisconsin, except for education attainment, which was based on the 1990 Wisconsin Census data. In addition to demographic and SES characteristics, the WTS data were weighted based on two locations – Milwaukee County/Racine County and all other Wisconsin Counties. This was done to adjust the data based on these two locations because the WTS includes an over sample of Milwaukee and Racine Counties, resulting in an over representation of these populations.

REFERENCES

- Centers for Disease Control and Prevention. Cigarette smoking among reproductive-aged women – Behavioral Risk Factor Surveillance System, 1989. *MMWR*. 1991; 40(42):719-723.
- Fiore MC, Bailey WC, Cohen SJ, et al. *Treating Tobacco Use and Dependence*. Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service. June 2000.
- Jehn L, Kvale K, Weisskopf M, Glysch R, Schell W, Remington P. Smoking during pregnancy in Wisconsin compared to the United States, 1997. *Wis Med J*. 2001;100(3):34-9.
- Kvale K, Glysch RL, Gothard M, Aakko E, Remington P. Trends in smoking during pregnancy, Wisconsin, 1990 to 1996. *Wis Med J*. 2000;99(2):63-67.
- Lu Y, Tong S, Oldenburg B. Determinants of smoking and cessation during and after pregnancy. *Health Promotion International*. 2001;16(4): 355-365.
- Mathews TJ. Smoking during pregnancy in the 1990s. *National Vital Statistics Reports: vol 49 no 7*. Hyattsville, MD: National Center for Health Statistics, 2001.
- U.S. Department of Health and Human Services. *Women and Smoking*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2001. For more information, visit this website: http://www.cdc.gov/tobacco/sgr_forwomen.htm
- Wisconsin Department of Health and Family Services, Division of Health, Center for Health Statistics, *Wisconsin Behavioral Risk Factor Survey 1996*. Available at: <http://www.dhfs.state.wi.us/stats/pdf/96brfs.pdf>
- Wisconsin Department of Health and Family Services, Division of Health Care Financing, Bureau of Health Information. *Wisconsin Births and Infant Deaths, 1995*. December, 1996. Available at: <http://www.dhfs.state.wi.us/births/pdf/95births.pdf>
- Wisconsin Department of Health and Family Services, Division of Health Care Financing, Bureau of Health Information. *Wisconsin Births and Infant Deaths, 2000* (PHC 5311). December, 2001. Available at: <http://www.dhfs.state.wi.us/births/pdf/00births.pdf>



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