

Clean Indoor Air Policies in Wisconsin Workplaces

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ABSTRACT

Objective: To describe the nature and extent of workplace environmental tobacco smoke exposures in Wisconsin.

Methods: Descriptive data and confidence intervals from the Current Population Survey tobacco supplements of 1995-1996 and 1998-1999 are presented.

Results: The percent of indoor workers working under a smoke-free policy increased slightly, from 62% in 1995-1996 to 65% in 1998-1999. Respondents with a college degree were more likely to work under a smoke-free policy than those with a high school education or less. Among respondents with a work policy in 1998-1999, a complete ban on smoking reduced any workplace exposure in the past 2 weeks (4%) compared to a partial ban (26%) or an unrestricted policy (30%).

Conclusion: Wisconsin has seen a small increase in workplace policies that ban smoking in the workplace. These policies are more likely to protect workers of higher socioeconomic status and may increase health disparities in tobacco-related diseases in the future.

INTRODUCTION

Cigarette smoking is the leading cause of death in the United States and in Wisconsin.^{1,2} An estimated 7300 people die in Wisconsin each year because of smoking-related diseases.² The impact of cigarette smoking extends beyond smokers. Over the past 2 decades, adverse health effects associated with exposure to environmental tobacco smoke, also known as secondhand smoke, have been well documented. Lung cancer, heart disease, and respiratory disease have been linked with exposure

to environmental tobacco smoke. In children, exposure is associated with sudden infant death syndrome, low birth weight, chronic middle ear infections, and respiratory illnesses.^{3,4} Based on national estimates, each year approximately 60 people in Wisconsin die from lung cancer and as many as 1000 die from heart disease attributed to exposure to environmental tobacco smoke.³

In 2000, the Wisconsin Tobacco Control Board set 7 goals related to reducing the burden of tobacco in Wisconsin. Four of these 7 goals focused on reducing exposure to secondhand smoke in public and private places like workplaces and homes. The purpose of this study is to characterize workplace clean indoor air policies among Wisconsin workers. State and national trends in workplace smoking policies have been tracked using the US Census Bureau's Current Population Survey since 1993.⁵ The Current Population Survey's sample sizes are large enough to examine differences in workplace smoking policies by different demographic subgroups such as age, income, and occupation. Understanding workplace smoking policies enables public health advocates to assess the number of people exposed to secondhand smoke at work. In addition, determining which demographic subgroups are less likely to be protected by such policies enables public health researchers to focus their program and policy efforts toward maximizing the number of people protected by smoke-free workplace policies.

METHODS

The Current Population Survey (CPS) is a national ongoing survey of about 50,500 households. The United States Bureau of the Census conducts the survey monthly for the Bureau of Labor Statistics. The survey has been conducted for more than 50 years and is the primary source of information on labor force characteristics of the US population. The sample is scientifically selected to represent the civilian non-institutional population.

Respondents are interviewed to obtain information about the employment status of each member of the household aged 15 years and older, although published

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Table 1. Percent of Workers Covered by Various Workplace Smoking Policies, United States and Wisconsin, 1995-1996, 1998-1999

	United States 1995-1996 N = 85,461*		Wisconsin 1995-1996 N = 1604*		United States 1998-1999 N = 82,334*		Wisconsin 1998-1999 N = 1391*	
	%	95% CI†	%	95%CI†	%	95%CI†	%	95%CI†
Not allowed in any public or work areas	63.9	± 0.5	61.7	± 3.5	69.3	± 0.4	64.9	± 2.6
Allowed in some or all public or work areas	21.5	± 0.7	22.9	± 5.0	17.2	± 0.7	20.0	± 4.9
No official smoking policy	14.6	± 0.7	15.4	± 5.3	13.5	± 0.7	15.1	± 5.0

* Actual number surveyed.

† Ninety-five percent confidence interval, represented by plus or minus 1.96 multiplied by the standard error.

Table 2. Percent of Workers* Covered by Smoke-Free Workplace Policies, United States and Wisconsin, 1998-1999

	N†	%	95% CI†	N†	%	95% CI†
Total Population	82,334	69	± 0.3	1,391	65	± 2.6
Gender						
Males	34,097	64	± 0.5	576	57	± 4.0
Females	48,237	74	± 0.5	815	72	± 3.3
Age						
<18	1,568	56	± 2.3	37	56	± 14.0
18-24	8,427	61	± 1.0	156	62	± 6.7
25-44	43,497	70	± 0.5	744	64	± 3.7
45-64	26,750	74	± 0.6	424	70	± 4.8
65-90	2,092	69	± 2.4	30	67	± 19.4
Race/Ethnicity						
White, non-Hispanic	65,285	70	± 0.4	1,291	64	± 2.7
Black, non-Hispanic	7,417	69	± 1.0	45	80	± 11.0
Hispanic	6,092	65	± 1.1	20	63	± 20.7
American Indian/ Alaskan Native	751	60	± 4.3	19	67	± 21.2
Asian/Pacific Islander	2,789	71	± 1.7	16	81	± 17.6
Educational Level						
<High School	7,975	53	± 0.6	133	52	± 8.0
High School or GED	24,542	62	± 0.7	459	60	± 4.7
Some College	23,923	70	± 0.6	414	65	± 4.8
Bachelor's Degree or higher	25,894	81	± 0.5	385	77	± 4.4
Income Level						
Unknown	5,245	68	± 1.3	77	59	± 11.3
\$0-14,999	7,385	59	± 1.2	112	58	± 9.0
\$15,000-24,999	9,021	63	± 1.1	159	65	± 7.6
\$25,000-49,999	26,040	67	± 0.6	472	61	± 4.6
>\$50,000	34,643	75	± 0.5	571	71	± 3.9

* Excludes those working in someone's home, traveling from site to site, working outdoors or in a motor vehicle. Also excludes anyone who did not respond either affirmatively or negatively to this question.

† Actual number surveyed.

‡ Ninety-five percent confidence interval, represented by plus or minus 1.96 multiplied by the standard error.

data focus on those ages 16 and over. The sample provides estimates for the nation as a whole and for individual states and other geographic areas. Approximately 25% of all interviews are conducted in person and 75% by telephone. Supplemental questions to produce estimates on a variety of topics including school enrollment, income, previous work experience, health, employee benefits, and work schedules are often added to the regular Current Population Survey questionnaire.

The National Cancer Institute collaborated with the US Census Bureau to obtain surveillance data on tobacco-related questions as part of an evaluation of the American Stop Smoking Intervention Study (ASSIST) program. As a result, an approximately 40-item Tobacco Use Supplement was developed by National Cancer Institute staff and administered as part of the Current Population Survey in September 1992, January and May 1993, September 1995, January and May 1996, September 1998, and January and May 1999.

The Tobacco Use Supplement measures indicators of tobacco control from initial markers such as workplace smoking policies to intermediate markers like quit attempts and intentions to quit, as well as cigarette and other tobacco use prevalence, cigarette consumption, quitting rates, and initiation rates.

For this study, we analyzed data on workplace smoking policies from the Tobacco Use Supplements from September 1995, January and May 1996, September 1998, and January and May 1999. Combining the 3 monthly samples from a survey cycle gives the best state level estimates on these questions. In the United States, approximately 245,000 individuals 15 years and older responded to the September 1995 and January and May 1996 surveys combined; and approximately 240,000 to the September 1998, and January and May 1999 surveys combined.³ Approximately 80% of responses were self-response, while 20% were responses by proxy. A total of 5933 respondents from Wisconsin were surveyed for the 1995-1996 survey and 5674 for the 1998-1999 survey.

The Tobacco Supplement contains 2 questions that address workplace smoking policies:

1. Which of these best describes your place of work's smoking policy for indoor public or common areas such as lobbies, rest rooms, and lunchrooms?
2. Which of these best describes your place of work's smoking policy for work areas?

Possible responses to these questions were, "not allowed anywhere," "allowed in some areas," "allowed in all areas," "refused," and "don't know." Additionally, for some analyses, responses to these 2 questions have been combined with a question on the existence of an official smoking policy to create the 3 categories: "smoking is not allowed in any public or work areas," "smoking is allowed in some or all public or work areas," and "no official smoking policy."

The major occupational classification of CPS data is based on the coding systems used in the 1990 census. A list of these codes can be found in the Alphabetical Index of Industries and Occupations.⁶

Estimated percentages within the various categories were obtained using weights provided by the Bureau of Labor Statistics and an analytic technique that accounted for household clusters.⁷ Standard errors were calculated with formulas and adjustment parameters provided by the Bureau of Labor Statistics, which took into account the design of the complex sample survey. Ninety-five percent confidence intervals are calculated by multiplying the standard error by 1.96. Very wide confidence intervals are indicative of small sub-populations, as can be seen in some age and race groups in Wisconsin.

RESULTS

Table 1 shows the range of workplace smoking policies for both the United States and Wisconsin. Overall, smoke-free policies have increased in both the United States and Wisconsin from the mid to late 1990s. The percent of United States indoor workers working under a smoke-free policy increased from 64% in 1995-1996 to 69% in 1998-1999. In Wisconsin, the percent of indoor workers working under a smoke-free policy increased from 62% in 1995-1996 to 65% in 1998-1999 (95% confidence interval for the increase, 0.0% to 7.6%). In addition, there was a commensurate decline in the percentage of indoor workers in Wisconsin who work in places where smoking is allowed in some or all areas. No appreciable change was seen in the percentage of indoor workers who indicated that their workplace had no official smoking policy (15.4% to 15.1%).

Table 2 shows differences by demographic characteristics of indoor workers who work under a smoke-

Table 3. During the Past 2 Weeks, Has Anyone Smoked in the Area in Which You Work by Worksite Smoking Policy, Wisconsin, 1998-1999*

Work Policy	United States		Wisconsin	
	% Yes	95% CI†	% Yes	95% CI†
Indoor Public or Common Areas				
Not allowed in any public areas	4.8	± 0.2	4.8	± 1.4
Allowed in some public areas	21.1	± 0.8	23.5	± 5.6
Allowed in all public areas	26.3	± 3.3	36.7	± 33.4
Work Areas				
Not allowed in any work areas	4.5	± 0.2	4.6	± 1.3
Allowed in some work areas	38.9	± 1.4	50.1	± 10.2
Allowed in all work areas	28.0	± 2.8	37.1	± 25.4

*This question was only asked among those that have a work smoking policy. It excludes those working in someone's home, traveling from site to site, working outdoors or in a motor vehicle. It also excludes anyone who did not respond either affirmatively or negatively to this question.

† Ninety-five percent confidence interval, represented by plus or minus 1.96 multiplied by the standard error.

free policy in Wisconsin. Of Wisconsin women who work indoors, 72% work in an environment where smoking is not allowed in any public or work area, compared to 57% of men. In addition, people over 45 years old are somewhat more likely to work in places that do not allow smoking compared to younger adults. About 80% of African American and Asian American indoor workers in Wisconsin work under a smoke-free policy, compared to 63% of Hispanic and 64% of white indoor workers. Finally, Wisconsin residents with less than a high school education or with a high school diploma, as well as residents making less than \$15,000 are much more likely to work in an environment where smoking is permitted or unregulated.

The percentage of workers reporting exposure to smoke in their work area in the past 2 weeks is shown in Table 3. Overall, 3.6% of Wisconsin workers in workplaces with a complete smoke-free policy reported having been exposed to smoke (data not shown). This increases to 4.8% and 4.6%, respectively, when considering common areas and work areas separately. The percentages are much higher in workplace situations where smoking is allowed in some areas and in all areas, with a similar pattern in both Wisconsin and the entire nation.

Table 4 shows occupational differences in Wisconsin indoor workers working under a smoke-free policy. About 80% of indoor workers who work in professional specialties, protective services, and as technicians worked in environments that had a smoke-free policy compared to 22% of farmers and 50% of machine operators and assemblers. In general, Wisconsin residents who work in en-

Table 4. Cigarette Smoking Prevalence and Percent of Workers Covered By a Smoke-free Workplace Policy, By Occupation, United States and Wisconsin, 1998-1999*

Occupation	United States			Wisconsin		
	% Smokers [†]	% Covered	95% CI [‡]	% Smokers [†]	% Covered	95% CI [‡]
Professional specialty	11	84	± 0.3	9	83	± 2.8
Technicians	19	77	± 0.9	22	79 [§]	± 7.4
Administrative support	22	76	± 0.4	22	70	± 3.6
Executive, managerial	19	75	± 0.5	19	68	± 4.4
Sales	23	68	± 0.6	24	64	± 5.1
Protective services	20	67	± 1.8	35	80 [§]	± 13.0
Services, not private or protective	30	57	± 0.7	43	57	± 5.1
Handlers, laborers	29	56	± 1.3	44	55	± 9.7
Precision production	31	52	± 0.9	32	51	± 6.2
Machine operators, assemblers	32	50	± 1.0	40	49	± 6.3
Transportation	34	47	± 2.6	34	52 [§]	± 16.1
Farming	23	42	± 4.4	22	22 [§]	± 35.5
Private household	21	33 [§]	± 9.3	-	-	-

*Excludes those working in someone's home, traveling from site to site, working outdoors or in a motor vehicle.

[†] Workers who self-report smoking 100 cigarettes in a lifetime and currently smoking every day or some days.

[‡] Ninety-five percent confidence interval, represented by plus or minus 1.96 multiplied by the standard error.

vironments that allow smoking are more likely to smoke themselves. Specifically, 40% of machine operators and assemblers report that they also smoke cigarettes compared to only 9% of people working in professional specialties and 22% of technicians. Those in protective services and in farming are an exception to this trend. There was a high percentage of smokers among protective services workers (35%) despite high smoke-free policy coverage (80%) and a low percentage of smokers among farmers (22%) despite low smoke-free coverage (22%).

DISCUSSION

More Wisconsin residents report that their workplaces are adopting policies that restrict smoking in both public and work areas. While Wisconsin has been steadily increasing the number of workplaces with smoke-free policies, the state has not progressed as much as other states. Wisconsin's ranking in the percentage of employees working under a smoke-free policy fell from 29th best in the country in 1993 and 1996 to 37th in 1999.⁸ If Wisconsin continues to increase the number of smoke-free workplace policies by only 3% every 3 years, in 2005 71% of Wisconsin workers will work under smoke-free policies, far below the goal of 90% set by the Wisconsin Tobacco Control Board.

Our study, consistent with previous research, found a relationship between income and education and workplace smoking policy.^{9,10} Those respondents with lower levels of income and education were less likely to work under a smoke-free policy compared to those respondents with higher income and education levels. Previous research on cigarette smoking prevalence in Wisconsin has also found the same income and education gradient. Those with less

income and education are more likely to smoke compared to other groups.¹¹ Taken together, these studies suggest that there are socioeconomic differences in who is affected by cigarette smoking, either directly by active smoking or indirectly by exposure to secondhand smoke.

An important finding is that work policies allowing smoking in some areas results in a rate of exposure to smoke in work areas similar to policies that allow smoking everywhere and thus is ineffective in reducing exposure (Table 3). A complete ban on smoking in the workplace significantly reduces the number of persons who report being exposed to smoke in their work area in the previous 2 weeks.

The current study also found strong differences in occupation and smoke-free workplaces, again consistent with previous research.^{9,12} Workers in professional specialties, protective services, and those who work as technicians are more likely to work under a smoke-free policy compared to those who work as machine operators and assemblers and those who work in precision production. Wisconsin's Clean Indoor Air Act restricts smoking in office buildings and specifically permits smoking in manufacturing and assembly workplaces.^{13,14} However, Anderson and colleagues report that the primary reasons for implementation of worksite smoking policies include health, cleanliness, safety, and employee request, and this was true for all industries.¹⁵ They also report, though, that the manufacturing industry in Wisconsin has a higher percentage of worksites with only a partial ban on smoking than other occupations, with the exception of farming/mining/forestry/construction, restaurant/entertainment/ lodging/recreation and "other" services.

Our study also found that cigarette smoking preva-

lence was generally higher among people in occupations with a lower percentage of workers covered by a smoke-free workplace policy. These findings support previous research indicating that one primary benefit to adopting smoke-free workplace policies is that smokers who work in environments that do not allow smoking smoke fewer cigarettes and are more likely to quit smoking altogether compared to those workers in environments that continue to allow smoking. An analysis of 19 studies on cigarette consumption and smoke-free policies found that 18 of those studies had declines in daily smoking rates, and 17 showed declines in smoking prevalence after policy implementation.¹⁶ Researchers have suggested that smoke-free workplace policies are responsible for reducing the total number of cigarettes consumed by 2%, or 9.7 billion cigarettes each year.¹⁶ Another study conducted in Missouri showed that employees in hospitals that recently enacted smoke-free workplace policies had higher quit ratios than employees in workplaces without such smoking bans.¹⁷

There are several limitations to this study. The 1998-1999 data was the most recent available. Current smoke-free policies may be different from what is shown here. Small numbers in some of the subgroups, especially for Wisconsin, make estimates unstable. Because of the complex nature of the survey design, regression techniques cannot be used to control simultaneously for multiple covariates.

CONCLUSION

Overall, our study found that in Wisconsin the number of workers working under smoke-free policies has increased slightly over the past few years. However, enforced smoking policies lag behind the US average and are increasing at a lower rate than in some states. There are also major differences in who is protected by these policies. People with less income and lower levels of education, as well as those who work in occupations like manufacturing and assembly are more likely to work in places that permit smoking, and thus more likely to be exposed to secondhand smoke. This research, along with data on smoking prevalence, shows that the greatest burden of cigarette smoking is concentrated in certain demographic subgroups. Enacting smoke-free workplace policies both ensures that Wisconsin residents are protected from exposure to secondhand smoke, and encourages smokers to reduce or quit smoking altogether. If Wisconsin is able to reach the Wisconsin Tobacco Control Board's goal that 90% of workplaces be smoke-free by 2005, the health burden associated with cigarette smoking will be greatly reduced for all Wisconsin workers.

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