US Adult Attitudes and Practices Regarding Smoking Restrictions and Child Exposure to Environmental Tobacco Smoke: Changes in the Social Climate From 2000–2001

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ABSTRACT. *Objective.* **A substantial proportion of homes and automobiles serve as settings for environmental tobacco smoke (ETS) exposure, and many public settings that children frequent are still not smoke-free. Tobacco control efforts are attempting to increase smoking bans. The objective of this study was to describe the knowledge, attitudes, and practices of smokers and nonsmokers regarding smoking bans and child ETS exposure in multiple public and private settings and to report changes from 2000–2001.**

Methods. **Cross-sectional data from the annual Social Climate Survey of Tobacco Control were analyzed for changes in knowledge, attitudes, and practices regarding tobacco. These data were collected via automated, random-digit-dialing telephone surveys that were conducted in the summers of 2000 and 2001. The samples were weighted by race and gender to be representative of the US population.**

Results. **Response rates for eligible adults actually contacted were 1501 (75%) of 1876 in 2000 and 3002 (84%) of 3566 in 2001. The majority of adults, both smokers and nonsmokers, support smoking bans in a wide variety of places. The percentage of all respondents reporting the presence of smoking bans in several public and private places increased from 2000–2001: the household (69%–74%), in the presence of children (84%–88%), convenience stores (68%–74%), fast-food restaurants (52%–58%), and non–fast-food restaurants (25%–28%). Support for smoking bans also increased in shopping malls (71%–75%), fast-food restaurants (77%–80%), and indoor sporting events (78%–80%). There were no significant changes in support for smoking bans in convenience stores, restaurants, or outdoor parks. Adults' knowledge of the harm caused by tobacco was unchanged, with the vast majority of adults recognizing the dangers of exposure to ETS from parental smoking (95%) and exposure to ETS in cars (77%).**

Conclusions. **Small improvements in adult attitudes and practices regarding children's ETS exposure occurred from 2000–2001. However, a significant number of adults in the United States still report ignorance of the harmful effects of child ETS exposure, and there was no improvement in reported knowledge in this 1-year period. In contrast, a growing majority of smokers and nonsmokers favor restrictions on smoking in public settings, suggesting that states and communities have public support for broad public smoking restriction policies. There are significant roles that pediatricians can play in preventing children's ETS exposure, through both patient and family education and by moving smoking restriction policies forward on their community's agenda.** *Pediatrics* **2003;112:e55–e60. URL: http://www.pediatrics.org/cgi/content/full/112/1/e55;** ***tobacco smoke pollution/prevention and control, child, adult.***

ABBREVIATIONS. ETS, environmental tobacco smoke; SCS-TC, Social Climate Survey of Tobacco Control.

There is a growing awareness that adult tobacco use is also a child health or pediatric problem.[1–3] Children's prenatal and passive environmental tobacco smoke (ETS) exposure has multiple significant negative effects on their health during both their childhood and subsequent adulthood. These include higher rates of low birth weight and birth complications, asthma prevalence and severity, lower respiratory infections, sudden infant death syndrome, otitis media, and lung cancer as adults, as well as deleterious effects on behavior and cognition.[2–7]

Parental smoking is a potent predictor of smoking in adolescents who go on to be adult smokers,[2,8–10] and household smoking control regulations are associated with lower adolescent smoking rates.[2,11] Also of importance are the modeling effects that adult smokers have on children. The vast majority of smokers begin before 19 years of age, when they are not yet living independently.

Although the American Academy of Pediatrics has issued 4 policy statements and a Handbook of Pediatric Environmental Health that offer guidance on tobacco-related counseling and advocacy efforts,[3,12–15] the evaluation of progress in this area has been hampered by the lack of timely, comprehensive data about tobacco control attitudes and practices of

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US adults. Although there have been a substantial number of studies of attitudes toward the control of smoking in public settings,[2,8,11,16–22] no such descriptive studies published to date in the peer-reviewed literature have been comprehensive or national in scope. In addition, a Medline search failed to reveal a single article in any of the major pediatric journals (*Pediatrics*, *Journal of Pediatrics*, *Archives of Pediatrics and Adolescent Medicine* [formerly *the American Journal of Diseases of Childhood*], *Clinical Pediatrics*, and *Ambulatory Pediatrics* [formerly the *Journal of Ambulatory Pediatrics*]) dealing with this topic.

The purpose of this article is to report changes in US adult attitudes and practices regarding children's exposure to ETS from 2000–2001. These findings are based on cross-sectional data from an annual survey conducted to assess US adults' knowledge of the harmful effects of tobacco use and children's ETS exposure, attitudes toward tobacco control in public settings, and tobacco control attitudes and practices in private settings, eg, homes, cars.

METHODS

Respondents

The Social Climate Survey of Tobacco Control (SCS-TC) was administered to representative samples of US adults who were interviewed by telephone between July and September of either 2000 or 2001. Samples from both years represent the civilian, noninstitutionalized adult population over age 18 in the United States, including Alaska and Hawaii. Households were selected using random-digit-dialing procedures to include households with unlisted numbers. Once a household was contacted, the adult to be interviewed was selected by asking to speak with the person in the household who is 18 years of age or older and who will have the next birthday. Five attempts were made to contact those selected adults who were not home. The 2000 and 2001 samples were weighted by race and gender within each census region, based on the 1999 and 2000 US Census estimates, respectively.

Measures

The results presented in this article are from data on a subset of the measures included in the SCS-TC. The SCS-TC was first administered in July/August 2002 by researchers at Mississippi State University. The SCS-TC is an annual cross-sectional survey that contains items pertaining to normative beliefs, practices/policies, and knowledge regarding tobacco control across 7 social institutions: 1) family and friendship groups; 2) education; 3) workplace; 4) government and political order; 5) health and medical care; 6) recreation, leisure, and sports; and 7) mass culture and communication. Survey items were developed and selected on the basis of an extensive review of extant tobacco control surveys and then reviewed by a panel of tobacco control researchers. We developed many of the items included in the survey, whereas others were selected from existing measurement instruments with established validity. Specifically, the SCS-TC included items from the Behavioral Risk Factor Surveillance System,[23] the Tobacco Use Supplement-Current Population Survey,[24] and modified items from the California Adult Tobacco Surveys.[25]

Knowledge About ETS

Three measures assessed respondents' knowledge about the dangers of smoking in the presence of children. Respondents indicated their level of agreement or disagreement on a 4-point scale with the following statements: 1) inhaling smoke from a parent's cigarette harms the health of infants and children, 2) tobacco companies are being truthful when they say that secondhand smoke is not harmful to health, and 3) children are more likely to smoke if their parents are smokers. The first 2 items are modified from the California Adult Tobacco Survey.

Smoking Bans

Table 1 describes the 8 items that measured the prevalence of smoking bans in private and public places. Each respondent reported the degree of smoking restrictions in the home and pro-

TABLE 1. Smoking Bans: Variable Definitions

Variable	Survey Question	Responses*
Household smoking ban	Which of the following best describes your household's rules about smoking?	• Smoking is allowed in all parts of the home • Smoking is allowed in some parts of the home • **Smoking is not allowed in any part of the home**
Smoking is never allowed in the presence of children	In your home, is smoking in the presence of children always allowed, sometimes allowed, or never allowed?	• Always allowed • Sometimes allowed • **Never allowed**
Smoking is never allowed in the respondent's vehicle with children present	Please tell me which best describes how cigarette smoking is handled in your car when children are present.	• **No one is allowed to smoke in my car** • Only special guests are allowed to smoke in my car • People are allowed to smoke in my car only if the windows are open • People are allowed to smoke in my car at any time
Convenience stores in the community are smoke-free	Convenience stores in your community: are they completely smoke-free, have designated smoking and nonsmoking, or permit smoking anywhere?	• **Completely smoke-free** • Designated areas • Permit smoking anywhere
Fast-food restaurants in the community are smoke-free	Fast-food restaurants in your community: are they completely smoke-free, have designated smoking and nonsmoking, or permit smoking anywhere?	• **Completely smoke-free** • Designated areas • Permit smoking anywhere
Restaurants in the community are smoke-free	Restaurants in your community: are they completely smoke-free, have designated smoking and nonsmoking, or permit smoking anywhere?	• **Completely smoke-free** • Designated areas • Permit smoking anywhere
Outdoor parks in the community are smoke-free	Outdoor parks in your community: are they completely smoke-free, have designated smoking and nonsmoking, or permit smoking anywhere?	• **Completely smoke-free** • Designated areas • Permit smoking anywhere

* Bolded responses indicate how items were dichotomized in the analysis.

vided an assessment of smoking restrictions in public places within his or her community.[26]

Support for Restrictions on Smoking

We examined support for restricting smoking in private and public places with the 9 variables described in Table 2. These variables included attitudes about smoking bans in public places and normative beliefs about exposing children to ETS in private places.

Sociodemographic Variables

The SCS-TC included several items to assess demographic factors. Gender and race (white, nonwhite) were coded as dichotomous variables. Age and education were recoded to 4 levels (see Table 1). Region was coded to 4 levels based on the 4 census regions (Northeast, Midwest, South, and West).

Current Smoking

Two questions from the Behavioral Risk Factor Surveillance System were used to assess the current smoking status of respondents. Respondents were asked, "Have you smoked at least 100 cigarettes in your entire life?" Respondents who reported that they had were then asked, "Do you now smoke cigarettes every day, some days, or not at all?" Respondents who reported that they have smoked at least 100 cigarettes and now smoke every day or some days were categorized as current smokers.

Analyses

χ^2 procedures were used to examine changes from 2000–2001 in the percentages of respondents who indicated knowledge of ETS dangers, reported smoking bans, and supported restrictions on smoking. Associations were considered significant at $P < .05$ level. Multivariate logistic regression models were specified to examine significant changes from 2000–2001 while statistically controlling for sociodemographic factors. Each analysis regressed dichotomous social climate indicators on sample year (2000 vs 2001), as well as region, gender, race, age, education, rural/urban residence, and smoking status.

RESULTS

Sample

Of the eligible respondents successfully contacted in 2000, 1503 (74.9%) respondents completed the survey and 504 (25.1%) refused to participate. Of the eligible respondents contacted in 2001, 3002 (84.2%) completed the survey and 564 (15.8%) refused to participate. Table 3 shows the regional, smoking status, gender, race, ages, and educational characteristics of the sample in 2000 and 2001. In 2001, the percentage of US adults who currently smoked cigarettes was 21.8%, down slightly from 24.1% in 2000. However, this difference is not statistically significant. Table 4 presents US adults' attitudes and practices regarding smoking restrictions and child exposure to ETS by smoking status and year.

Knowledge About ETS

In 2001, almost all adults believed that smoke from a parent's cigarette is harmful to children (95%) and that tobacco companies are not being truthful when they say that second-hand smoke is not harmful (96%). These percentages did not significantly change from 2000. However, the percentage of adults who believed that children are more likely to smoke if their parents smoke increased significantly from 78% in 2000 to 83% in 2001.

Smoke-Free Places

The percentage of adults who reported household smoking bans increased significantly from 69% in 2000 to 74% in 2001. The percentage of adults who reported that smoking is never allowed in the pres-

TABLE 2. Support for Smoking Bans: Variable Definitions

Variable	Survey Question	Responses*
Smoking should not be allowed in child care centers	Smoking should be allowed in child care centers. Do you strongly agree, agree, disagree, or strongly disagree?	• Strongly agree • Agree • **Disagree** • **Strongly Disagree**
It is unacceptable for parents to smoke in front of children	It is acceptable for parents to smoke in front of children. Do you strongly agree, agree, disagree, or strongly disagree?	• Strongly agree • Agree • **Disagree** • **Strongly Disagree**
Hospitals should be smoke-free	In hospitals, do you think that smoking should be allowed in all areas, some areas, or not at all?	• All areas • Some areas • **Not at all**
Shopping malls should be smoke-free	In shopping malls, do you think that smoking should be allowed in all areas, some areas, or not at all?	• All areas • Some areas • **Not at all**
Convenience stores should be smoke-free	In convenience stores, do you think that smoking should be allowed in all areas, some areas, or not at all?	• All areas • Some areas • **Not at all**
Fast-food restaurants should be smoke-free	In fast-food restaurants, do you think that smoking should be allowed in all areas, some areas, or not at all?	• All areas • Some areas • **Not at all**
Restaurants should be smoke-free	In restaurants, do you think that smoking should be allowed in all areas, some areas, or not at all?	• All areas • Some areas • **Not at all**
Indoor sporting events should be smoke-free	In indoor sporting events, do you think that smoking should be allowed in all areas, some areas, or not at all?	• All areas • Some areas • **Not at all**
Outdoor parks should be smoke-free	In outdoor parks, do you think that smoking should be allowed in all areas, some areas, or not at all?	• All areas • Some areas • **Not at all**

* Bolded responses indicate how items were dichotomized in the analysis.

TABLE 3. Demographic Characteristics of Survey Sample

Variable	2000		2001	
	Weighted Count	%	Weighted Count	%
Region				
Northeast	282	18.8	584	19.0
Midwest	339	22.6	709	23.1
South	532	35.4	1111	36.2
West	348	23.2	669	21.8
Smoking status				
Nonsmoker	1140	75.9	2404	78.2
Smoker	362	24.1	669	21.8
Gender				
Male	743	49.5	1484	48.3
Female	757	50.4	1582	51.5
Race				
White	1149	76.5	2470	80.4
Black	177	11.8	383	12.5
Asian or Pacific Islander	41	2.7	25	0.8
American Indian or Alaskan Native	27	1.8	18	0.6
Other race	3	0.2	114	3.7
Age				
18–24	181	12.0	458	14.9
25–44	558	37.2	1193	38.8
45–64	508	33.8	967	31.5
≥65	255	17.0	455	14.8
Education				
<12 y	134	9.1	196	6.5
HS graduate	449	30.6	899	29.7
Some college	378	25.7	827	27.3
College graduate	509	34.6	1106	36.5

ence of children within their household also significantly increased from 2000–2001 (83.5%–87.9%). However, smokers were substantially less likely (62.9%) than nonsmokers (94.8%) to report the existence of a household ban on smoking in the presence of children, despite the finding that 89.5% of smokers recognized the ETS effects in infants and children. On the basis of respondents' perceptions of smoking bans in public places, the percentage of communities with smoke-free convenience stores, fast-food restaurants, and restaurants increased from 2000–2001 but did not change for shopping malls, indoor sporting events, or outdoor parks.

Support for Smoking Bans

With the exception of outdoor parks, the majority of adults supported smoking bans in each of the surveyed places or situations in 2000, and this majority remained at similar levels or increased slightly in 2001.

Smokers Versus Nonsmokers

Compared with nonsmokers, smokers had significantly lower levels of support for smoking bans in each of the proposed places or situations queried. Still, in both 2000 and 2001, the majority of smokers favored bans in child care centers, hospitals, shopping malls, convenience stores, fast-food restaurants, and indoor sporting events.

Households With Children Versus Those Without Children

Having children in the home may relate to people's attitudes, knowledge, and practices regarding children's exposure to ETS. Univariate analyses were conducted on the items summarized in Table 4 to determine whether respondents who had children living in the home were more likely to ban smoking and support smoking bans than those without children in the home. Results revealed few differences. Respondents with children in the home were less likely to ban smoking in the presence of children (83.7%) than respondents without children (90.5%) and less likely to believe that it is unacceptable for parents to smoke in front of children (74.6%) than respondents without children (77.9%). However, only the difference in smoking bans in the presence of children persisted when multivariate analyses were conducted to control for respondent's age, level of education, region of residence, gender, and race.

DISCUSSION

This study demonstrates that the majority of US adult smokers and nonsmokers support restrictions on smoking in almost all indoor public settings. This majority opinion extends to child care centers, hospitals, shopping malls, convenience stores, fast-food restaurants, and indoor sporting events. This study also demonstrates that many types of public indoor locations in communities do not have smoking bans. These data show that public indoor locations that currently allow smoking are probably contradicting the will of the majority of voters in their communities. Increasing recognition of this broad majority opinion has led to the passing of some local ordinances in specific cities banning smoking in certain indoor locations.[27] Small but statistically significant increases in respondents' reports of smoking bans in convenience stores, fast-food restaurants, and other restaurants were detected from 2000–2001.

In terms of smoking in restaurants in general, a 61% national majority favors a complete ban,

TABLE 4. US Adults' Attitudes and Practices Regarding Smoking Restrictions and Child Exposure to ETS by Smoking Status and Year

	Smokers (N = 3544; % Who Agree)		Nonsmokers (N = 1031; % Who Agree)		All Respondents (N = 4575; % Who Agree)	
	2000	2001	2000	2001	2000	2001
Knowledge about ETS						
Inhaling smoke from a parent's cigarette harms infants and children	86.6	89.5	95.9	96.7	93.8	95.1
Children are more likely to smoke if their parents are smokers	62.2	70.9†	83.2	86.7*	78.1	83.3†
Tobacco companies are being truthful when they say that second-hand smoke is not harmful to health	8.8	8.7	2.0	3.1	3.6	4.3
Presence of smoking bans						
Household smoking ban	28.5	30.2	82.1	86.3†	69.1	74.1†
Smoking is never allowed in front of children	56.9	62.2	91.9	94.8†	83.5	87.9†
Smoke-free indoor shopping malls	80.6	85.1	73.5	74.5	75.4	77.0
Smoke-free convenience stores	72.5	81.2†	66.9	71.2*	68.5	73.6†
Smoke-free fast food restaurants	55.4	62.3	51.0	56.5*	52.1	57.8*
Smoke-free restaurants	21.1	27.1	25.6	28.4*	24.5	28.1†
Smoke-free indoor sporting events	85.6	87.9	78.2	79.9	80.2	81.7
Smoke-free outdoor parks	6.0	8.1	8.6	7.9	7.9	7.9
Support for smoking bans						
Smoking should not be allowed in child care centers	95.3	97.9*	98.3	98.9	97.7	98.7*
It is unacceptable for parents to smoke in front of children	54.3	53.6	85.0	86.1	77.7	79.3
Smoking should not be allowed in hospitals	52.9	68.1‡	81.1	88.3‡	74.3	83.9‡
Smoking should not be allowed in indoor shopping malls	53.2	60.0†	77.3	79.5	71.4	75.3†
Smoking should not be allowed in convenience stores	74.9	80.3	90.0	88.7	86.3	86.9
Smoking should not be allowed in fast-food restaurants	58.2	61.0	82.7	85.2	76.8	80.0
Smoking should not be allowed in restaurants	32.7	32.2	70.1	69.5	61.0	61.4
Smoking should not be allowed in indoor sporting events	64.5	69.5*	81.6	83.5	77.5	80.4†
Smoking should not be allowed in outdoor parks	8.9	10.0	30.2	29.5	25.0	25.2

* Significant changes from 2000–2001 ($P < .05$), controlling for region, gender, race, age, education, rural/urban residence, and smoking status.
† Significant changes from 2000–2001 ($P < .01$), controlling for region, gender, race, age, education, rural/urban residence, and smoking status.
‡ Significant changes from 2000–2001 ($P < .001$), controlling for region, gender, race, age, education, rural/urban residence, and smoking status.

whereas one third of smokers themselves favor banning smoking in all restaurants. These numbers compare with almost three quarters of respondents who indicated that their local area did not have smoking bans in restaurants. This discordance between public opinion and local ordinances is disturbing given the released toxins and proven harms of second-hand smoke.[2–7] Equally disturbing is the possible exposure of infants and children to the toxins in these public indoor settings. This study further shows that 70% of US adult smokers have no smoking prohibition in their own homes, which places spouses, children, relatives, and all inhabitants at risk. The smoke generated from a single cigarette in a large room causes the air to fail the national minimum standard set by the Clean Air Act of 1994.[28] Only 14% of nonsmokers allowed smoking in their own homes.

It should be noted that these findings are based on a newly developed survey instrument. Most items were selected from existing survey instruments with established validity; a few items were developed for this survey and have not yet been validated. Specifically, each respondent reported the degree of smoking restrictions in the home and provided an assessment of smoking restrictions in public places within his or her community. The validity of self-report of smoke-free places is unknown. It is possible that respondents' definition of smoke-free public places may vary, and therefore these findings should be interpreted with caution. However, the accuracy of respondents' perceptions of smoking restrictions is not likely to vary from 2000–2001. To the extent that measurement error or potential bias exists, these errors should be equivalent in the random samples of adults who participated in the survey in each year.

Although the prevalence of smoking in the United States has decreased in recent years, approximately 25% of all US adults still smoke cigarettes,[29] >35% to 40% of children live in a home with at least 1 person who smokes,[30,32] and smoking initiation among adolescents is at historically high levels.[18,31] Unfortunately, laws that would place uniform restrictions on child ETS exposure remain elusive. Highly variable policies regarding tobacco control in public settings emanate from disparate state and local ordinances that are unevenly enforced. We are aware of no ordinances that concern smoking in private settings such as homes or cars.

When engaged, pediatricians have made unparalleled contributions to successful behavioral and policy changes that reduce health risks for children and their parents. For example, they were actively in-

volved in efforts to enact laws and policies that dramatically decreased childhood lead poisoning and have spearheaded movements to change social norms for infant car seats and bicycle helmets, just to name a few. As the people most knowledgeable about child health in their communities, pediatricians are uniquely suited to playing a role in reducing children's exposure to ETS. This role can have 2 facets: counseling individual parents about the adverse impact that smoke has on their child's health and working with the community as a whole to enact tougher antismoking laws and regulations. The data collected by this survey demonstrate that most adults would be likely to support pediatricians' efforts to reduce ETS exposure and will hopefully serve to encourage such activity.

Child ETS exposure is so common and so harmful that it likely represents the single greatest environmental risk for children in the United States. Careful tracking of improvements in the social climate for tobacco control may help adoption of tougher laws and regulations that will protect children.

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